# How Can Stakeholders' Visions for Rebuilding a Community be Compiled into a Plan? Recovery and Reconstruction Planning in Ojiya City

Norio MAKI and Haruo HAYASHI
Research Center for Disaster Reduction Systems, DPRI, Kyoto University

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**ABSTRACT**

The goal of this paper is to develop techniques to establish comprehensive disaster recovery and reconstruction planning with stakeholder involvement. This paper deals with disaster recovery and the reconstruction planning process in Ojiya City, which was heavily affected by the 2004 Niigata Chuetsu Earthquake Disaster. Disaster recovery and reconstruction planning is a process of compiling ideas or visions of stakeholders of an affected community into a plan. There are two aspects in planning; one is how the ideas of stakeholders are compiled into a plan to secure comprehensiveness, and the other is how a feasible plan is established. This paper will discuss these two aspects in planning from a case study of recovery and reconstruction planning in Ojiya City. A participatory planning scheme was adopted for the planning to accomplish the first aspects, and a strategic plan scheme was used to accomplish the second aspects. Comprehensive recovery and reconstruction from the 2005 Niigata Chuetsu Earthquake Disaster for Ojiya City based on a strategic plan framework was successfully developed through five stakeholder workshops. A goal statement of the plan is "making Ojiya better than before the earthquake." Six objectives comprising 1) Life Recovery, 2) Economic Recovery, 3) Infrastructure Restoration, 4) Community Empowerment, 5) Disaster Management, and 6) Citizen Participation were clarified through workshops as tasks to realize the goal, and 31 polices and 72 programs were established as tools to realize the six objectives.

## 1. INTRODUCTION

There is a long history of disaster recovery and reconstruction planning. After the San Francisco Earthquake in 1906, recovery and reconstruction plans that intended a complete change of the urban structure of San Francisco based on the "City Beautiful" concept were proposed, but the plans failed to be adopted (Burby, J., Raymond Ed. (1999)). Every city that has suffered severe damage from natural disasters and man-made disasters such as war and terrorist attack establish recovery and reconstruction plans. Japan also has a long history of disaster recovery and reconstruction planning. After the Great Kanto Earthquake in 1923, a dramatic disaster recovery and reconstruction plan intending to renovate Tokyo as modern city was primarily proposed by the central government's planning group led by Shinpei Goto. Unfortunately the plan could not be adopted because of budgetary constraints. Moreover, many cities that suffered damage during WW2 established a recovery and reconstruction plan. The characteristics of these plans such as those of San Francisco and Tokyo and recovery reconstruction plans from WW2 are all "Physical" reconstruction plans. These plans deal with the recovery and reconstruction of urban infrastructures such as road networks and land use.

An important lesson from recovery and reconstruction after the Kobe earthquake in 1995 is that coordination among physical recovery and reconstruction, community empowerment, and economic revitalization is very important to accomplish recovery and reconstruction from disaster, and stakeholder involvement in planning is essential (Hayashi, H. 2000). The same aspects are pointed out on the recovery and reconstruction of the WTC building, which collapsed due to a terrorist attack on September 11, 2001 (Mammen, D. 2005). Now, a holistic perspective and stakeholder involvement are required in a disaster recovery and reconstruction plan.

There is much discussion regarding the visions and management of "Physical" recovery and reconstruction plans. However, "comprehensiveness" and "stakeholder involvement" are new issues in recovery and reconstruction planning. There has been research on comprehensive planning with stakeholder involvement to accomplish a community's future vision in usual situations. There are two concerns in planning; one is already mentioned, which is how the ideas of stakeholders are compiled into a plan and how the plan can be made "comprehensive," and the other is how a feasible plan can be established. A strategic planning scheme is currently commonly used to establish a feasible plan in the field of planning (Hoch, C.J. ed. (2000)). Although the feasibility of the plan would suffer due to the societal situation, ensuring the feasibility of the established plan in the planning phase is important. In strategic planning, current situation analysis considering both external and internal factors is conducted to minimize disruption due to social factors.

The goal of this paper is to develop techniques to establish comprehensive and feasible disaster recovery and reconstruction planning with stakeholder involvement. This paper clarifies how these two concerns regarding planning such as comprehensiveness and feasibility were successfully accomplished in the recovery and reconstruction plan for Ojiya City from the case study of recovery

KEY WORDS: Stakeholder Involvement, Recovery and Reconstruction Planning, 2004 Niigata Chuetsu Earthquake, Strategic Planning

and reconstruction planning in Ojiya City.

## 2. DAMAGE TO OJIYA CITY FROM THE 2004 NIIGATA CHUETSU EARTHQUAKE

Ojiya City was heavily affected by the 2004 Niigata Chuetsu Earthquake Disaster **Table 1** shows damage situation of Ojiya City. Thirteen peopled were killed and more than 3,000 houses suffered major damage. Characteristic damage in Ojiya City is as follows. In addition to physical damage due to the earthquake, social disruption and economic loss affected the community, and several societal issues on post-event operation such as relief and recovery were raised. The following are topics for Ojiya City on damage, loss and societal issues in post-event operations.

1) The ratio of heavy + severe + moderate and slight is 1:2 (In case of the 1995 Kobe Earthquake, it was 1:1.)
2) An evacuation order continued in several districts for more than one year.
3) Private companies suffered severe economic loss, especially hi-tech companies making computers.
4) Many temporary housing residents tried to reconstruct their individual housing.

## 3. TWO ESSENTIAL CONSIDERATIONS IN PLANNING

Recovery and reconstruction planning is a process to summarize the visions and ideas of stakeholders on recovery from disaster, and a document organizing these visions and ideas is a plan. The established plan needs to be implemented to realize the contents of the plan. So, the plan structure should be feasible and effective as well as being a reflection of stakeholders' visions and ideas. In this paper, the planning process for the reconstruction and recovery plan of Ojiya City will be evaluated from two perspectives: 1) How the manageability and effectiveness of the plan was secured, and 2) How successfully various visions and ideas of stakeholders were compiled into the plan.

To make the plan feasible and effective, a strategic planning scheme is dominant in the field of planning as a planning tool. It starts from "situation analysis" that analyzes the present situation of organizations both from the internal aspects of organizations and the external aspects around organizations. SWOT analysis is usually used as the situation analysis method. In the process of SWOT analysis, assessment on the internal resources of organizations, their strengths and weaknesses, and on the external situation around organizations, opportunity and thread is analyzed. According to the results of SWOT analysis, objectives of the plan as tools to accomplish the set goal of the plan could be decided. In the strategic planning process, all the contents are decided using an objective-oriented approach. It means all the contents of the plan will be decided as tools to accomplish one higher level of content, for example, policies being countermeasures to accomplish an objective. **Fig. 1** shows the planning and contents structure of a strategic plan.


**Fig. 1** Structure of a Strategic Plan

**Table 1.** Damage situation of Ojiya City (as of January 31, 2006)

| Damage Situation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Human Causalities | Deaths 17 | | Heavy Injuries 120 | | Light Injuries 665 | | Total 785 | |
| Housing damage (buildings) | Heavy | Severe | Moderate | | Slight | | Total | |
| | 622 | 370 | 2,379 | | 7,521 | | 10,892 | |
| Fire | 1 Location (2 buildings burned) | | | | | | | |
| Economic Loss (JPY hundred million) | Housing | Private companies | Agriculture | Roads | Medical | Life lines | Public Facilities | Total |
| | 300 | 2100 | 380 | 216 | 80 | 144 | 180 | 3400 |
| Non-accessible areas | 21 destroyed | | 431 households | | 1, 472 people (recovered until Oct. 29, 2004) | | | |
| Shelter | 136 locations (Max) Oct. 27, 2004 (Dec. 20 no people) | | | | 29,243 people | | | |
| Food supply | 42,680 food items/day (Oct. 28, 2004) | | | | | | | |
| Evacuation orders | 12 districts (Max 29 district) | | | | 237 families (max 532) | | | |
| Temporary housing | Complexes | Units | Occupied Units | Families | Number of residents | Average age | Elderly residents over 65 years old | |
| | 17 | 870 | 850 | 669 | 2295 | 45.5 | 73 households | |

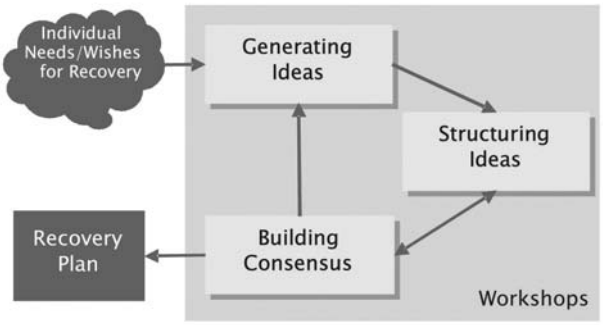


**Fig. 2** Workshops as a tool for participatory planning

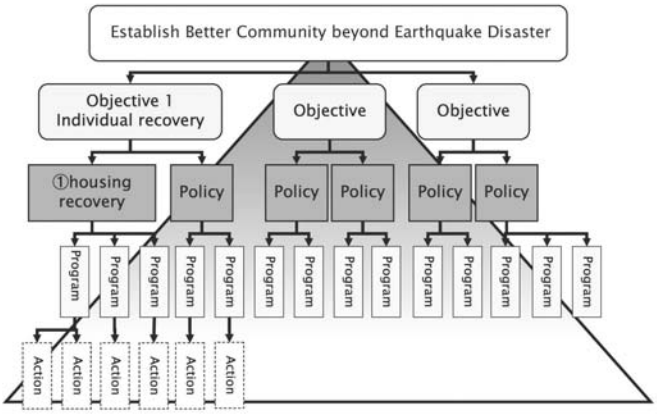


**Fig. 3** Structure of the Ojiya Recovery and Reconstruction Plan

The second point of planning is how successfully various visions and ideas of stakeholders were compiled into the plan. Participation of stakeholders in the planning process is essential to reflect stakeholders' visions and ideas in the plan. The first step of participatory planning is "Idea Generation." Through this process, the imagined visions and ideas of stakeholders are transformed into a statement and shared among stakeholders. The second step of participatory planning is "Structuralizing Ideas." Their visions and ideas collected through the "Idea Generation" process need to be structured as a plan. The final step of participatory planning is "Building Consensus" on structured ideas. **Fig. 2** shows the planning process from a participation viewpoint. The following chapters will discuss how two aspects of the plan, manageability and stakeholder participation, were realized in the recovery and reconstruction planning in Ojiya.

There are various techniques such as the causal relation diagram, brain storming, and idea grouping (KJ method) to manage the above-mentioned objectives. The points are how these techniques are compiled into the whole planning process to establish a comprehensive plan with stakeholder involvement. This paper discusses how these techniques are used in the whole planning context.

## 4. HOW WAS A MANAGABLE AND EFFECTIVE PLAN ESTABLISHED? STRATEGIC PLANNING PROCESS OF THE OJIYA RECOVERY AND RECONSTRUCTION PLAN

### 4.1 PLANNING PROCESS

A five-layered strategic plan, which consisted of one goal statement and 6 objective statements, was established through five series of workshops (**Fig. 3**). **Table 2** shows an outline of each workshop.

Present situation analysis of the city was conducted both at the 1st administrators' 'workshop and the 1st citizens' workshop. Through these workshops, points of consideration about recovery and reconstruction reflecting the present situation of the community were clarified.

At the 2nd and 3rd administrators' workshop, 1) objectives were set based on situation analysis and 2) ideas that were generated by the administrators and citizens were structured by a means-and-end relationship according to a strategic planning framework. "The draft recovery and reconstruction plan of Ojiya City" was established through these processes.

**Table 2.** Outline of Workshop

| | Goal | Points of Discussion | Date | Participants |
|---|---|---|---|---|
| 1st Administrators" workshop | Setting points in recovery and reconstruction | SWOT analysis | 1/28/05 | 75 |
| 1st Citizens' workshop | Setting points in recovery and reconstruction | Discussion on points to be better city than before | 2/20/05 | 108 |
| 2nd Administrators" workshop | Setting objectives | Structuring ideas on the plan | 2003/2/5 | 50 |
| 3rd Administrators" workshop | Setting policies and programs | Reviewing the plan | 3/24/05 | 24 |
| 2nd Citizens' workshop | Reviewing Draft Plan and Prioritize Programs | Adding new ideas and prioritizing programs | 2004/10/5 | 51 |

Citizens reviewed "the draft plan" at the 2nd citizen workshop. They added new ideas to the draft plan and prioritized the contents of the program level (ref. **Fig. 3**) through citizen perspectives. Finally, the "Ojiya Recovery and Reconstruction Plan (Draft)" was established. The following sections will explain step by step how the participation of stakeholders was managed at each workshop.

### 4.2 STEP 1: SITUATION ANALYSIS OF THE COMMUNITY FOR RECOVERY AND RECOSTRUCTION (1st, 2nd Administrators WS, and 1st Citizens WS)

For situation analysis on recovery and reconstruction, SWOT analysis was used at the administrators' workshops and at the citizens' workshop, simplified-method was used, where participants responded to the following issues: 1) Things to be settled and recovered; 2) Things to be avoided, quitted, and altered; 3) Things to be maintained; and 4) Things to be developed and summarized.

From the SWOT analysis by administrators, six points to be considered for recovery and reconstruction of the city were developed. As external factors, the following three points were clarified.

1) Now the city is a well known community because of the impact of disaster.

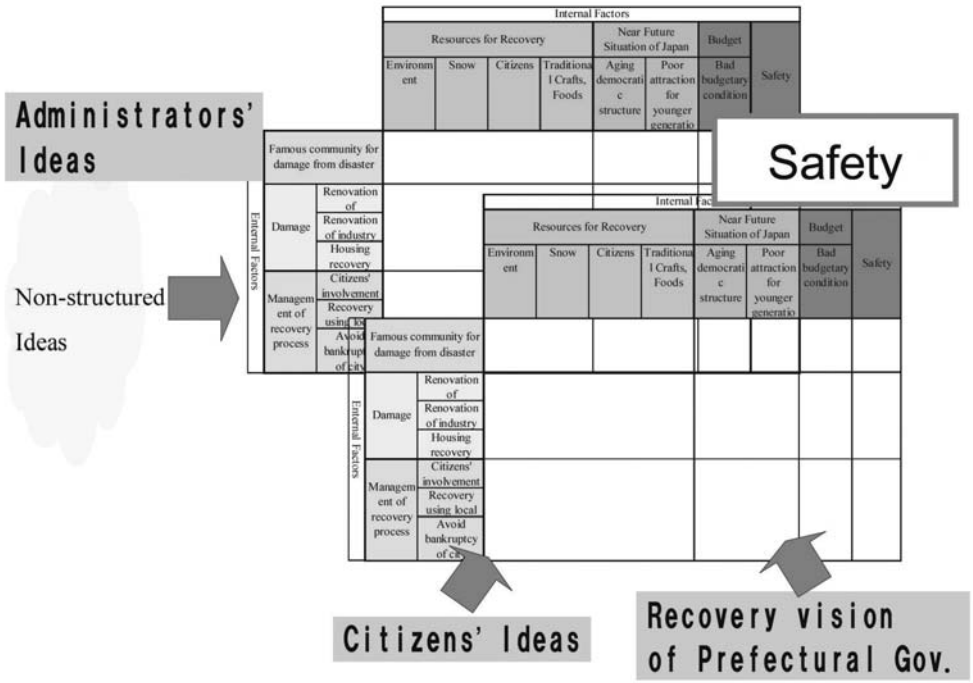


**Fig. 4** STATUS ANALYSIS OF THE COMMUNITY

2) Damage and loss due to the disaster
3) Good management of the recovery and reconstruction process; citizens' involvement; avoiding a budget crisis and local economy-based recovery

As internal factors, the following three points were developed.

1) There are rich local assets for recovery; there is a good natural environment such as snow and scenic beauty, good people, food, and traditional crafts.
2) Aging demographic structure of the community
3) Budgetary constraints

Cross checking on points of consideration based on situation analysis by administrators and citizens was conducted. This found whether points that were generated from the workshop by the administrators and citizens were synchronized. In addition, comparison with the "recovery and reconstruction vision" that was published by the prefectural government was conducted. From this comparison, safety issues that were pointed out by the Niigata Prefecture Government were lacking in the situation analysis in the community, and safety issues were added as points of consideration.

The above-mentioned six points and safety, a total of seven points, were clarified as points of consideration for recovery and reconstruction planning for the city. The planning process in this step is summarized in **Fig. 4**.

### 4.3 STEP 2 SETTING OBJECTIVES OF THE PLAN (2nd and 3rd Administrators Workshop)

According to results of the situation analysis, the objectives of the recovery and reconstruction plan were set. Using the matrix (**Fig. 5**) that was developed through the situation analysis, ideas on recovery and reconstruction generated both from administrators and citizens were organized. At first, these ideas were sorted into corresponding cells of the matrix. For example, ideas such as "Promoting Ojiya products using the name of the city that is now famous for disaster impact" will be sorted into the cell corresponding to "Famous Community" by "Using the Local Resources." After sorting out the ideas, the ideas were organized into tree structures reflecting the strategic planning structure shown in **Fig. 3**. Finally, the following six sentences were developed as the objectives of the plan.

1) Life Recovery: Restore daily life and make the community safer.
2) Economic Recovery: Revitalize the local economy using the rich natural resources of the community.
3) Infrastructure Restoration: Make a safer social infrastructure.
4) Community Empowerment: Empower the local community that has worked as a mutual-aid system after the disaster.
5) Disaster Management: Establish a disaster-resilient community.
6) Smart recovery and reconstruction management: Establish citizens' involvement, avoid a budgetary crisis, and accomplish recovery of the community that could be proudly announced to the world.

### 4.4 STEP 3 STRUCTURING IDEAS ACCORDING TO A STRATEGIC PLANNING FRAMEWORK (3rd Administrators' Workshop)

At the 3rd administrators' workshop, ideas that were generated by administrators and citizens were structured by a means-and-end relationship according to a strategic planning framework. So, ideas to accomplish the "Objectives" were sorted into "Policies," and ideas to accomplish "Policies" were sorted into "Programs." New ideas were also added in this process, and in the higher layer of plan, such as Policy and Program statements, several ideas were summarized into one set of contents. "The draft recovery and reconstruction plan of Ojiya City" as shown in **Fig. 3** was established through these processes. The draft plan consisted of six

| | | | Internal Factors | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Resources for Recovery | | | | Near Future Situation of Japan | | Budget | Safety |
| | | | Environment | Snow | Citizens | Traditional Crafts, Foods | Aging democratic structure | Poor attraction for younger generatio | Bad budgetary condition | |
| External Factors | Famous community for damage from disaster | | | | | | | | | |
| | Damage | Renovation of | | | | | | | | |
| | | Renovation of industry | | | | | | | | |
| | | Housing recovery | | | | | | | | |
| | Management of recovery process | Citizens' involvement | | | | | | | | |
| | | Recovery using local | | | | | | | | |
| | | Avoid bankruptcy of city | | | | | | | | |

**Fig. 5** Planning Matrix

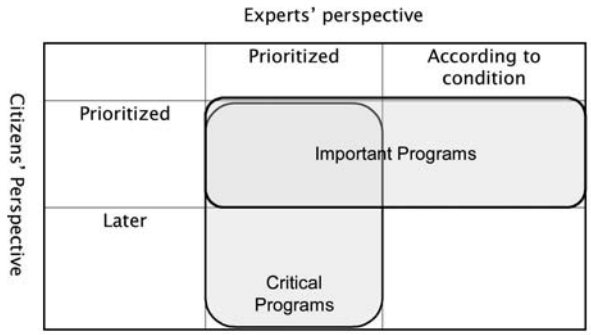


**Fig. 6** Citizen's perspectives and Experts' perspective

objectives, 31 polices, and 72 programs.

### 4.5 STEP 4 REVIEWING DRAFT RECOVERY AND RECONSTRCUTION PLAN OF THE COMMUNITY (2nd Citizens' Workshop)

In this step, citizens first reviewed the draft plan and added 120 new programs into the draft plan. Following citizen reviewing, prioritization of the contents at the "Program" level was conducted. There are two perspectives on prioritization. One is the perspective of citizens as stakeholders, and the other is the perspective of experts, which mean administrators, engineers, planners, and local bosses as specialists in implementing the plan in the projects (**Fig. 5**). Programs selected by citizens were called "Important programs" and those selected by specialists were called "Critical Programs." At the 2nd citizen workshop, prioritization by citizens of the perspectives was conducted. A total of 81 programs out of 192 (72 programs from the draft plan and 120 programs added by citizens) was selected as important programs. Prioritization by citizens was conducted by voting by citizens on each program. Programs that received more than 50% of agreement of citizens to be prioritized were selected as important programs.

### 4.6 STEP 4 MAKING THE DRAFT PLAN MANAGABLE (Policy Working Group, Action Plan Working Group and Drafting Committee)

Through five workshops comprising three administrators' workshops and two citizens' workshops, the Draft Ojiya Recovery and Reconstruction Plan was established. To make the plan more feasible, an Action plan that defines the agency or division responsible and the deadline for program completion should be established. The structure of the Action Plan will be shown in **Table 3**. Through discussions within the Working Group, the Action Plan was established.

Two working groups comprising the Policy Working Group and the Action Plan Working Group were organized for completing the Action Plan. Volunteer citizens and administrators worked together within the Action Plan Working Group to finalize the Action Plan. The Action Plan Working Group consisted of three groups. Group 1 dealt with recovery and reconstruction on individual, welfare, health, and disaster preparedness issue and consisted of 25 members who were 11 volunteer citizens and 14 administrators. Group 2 dealt with industry, the economy, and lifelines and consisted of 32 members who were 18 volunteer citizens and 14 administrators. Group 3 dealt with neighborhood community, management of recovery and reconstruction, budget, and citizens' involvement and consisted of 22 members who were 11 volunteer citizens and 11 administrators. The Policy Working Group was headed by the city manager and directors of the city government, and advisors from academia were members of this group.

Another task for making the plan feasible is the formalization process of the draft plan. To implement the plan, the agreement of local bosses is essential. The Drafting Committee consisted of various sectors within the community such as city council members, prefectural assembly members, health and medical organizations, local commercial organizations, and committees on community master plans, etc were also established for these tasks.

**Table 3.** Structure of the Action Plan

| Objectives | Policies | Programs | Actions | Responsible Body | | | Deadline | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Public Departments | Community | Individual | 1-2 years | 3-5 years | 10 years |
| 1 | 1-1 | 1-1-1 | 1-1-1-1 | | ○ | | ○ | | |
| | | | 1-1-1-2 | ○ | | | ○ | | |
| | | 1-1-2 | 1-1-2-1 | ○ | | | ○ | | |
| | 1-2 | 1-2-1 | 1-2-1-1 | ○ | | | | ○ | |
| | | | 1-2-1-2 | | | ○ | | | ○ |
| | | 1-2-2 | 1-2-2-1 | △ | ○ | | | ○ | |
| | | | 1-2-2-2 | ○ | | | ○ | | |

**Table 4.** Process for making the Action Plan and formalizing the draft plan

| | Policy WG | Action Plan WG Group 1-3 | Drafting Committee | City Council | Community Leasers | Citizens |
|---|---|---|---|---|---|---|
| 4/12 | 1st meeting | | | | | |
| 4/18 | | | 1st meeting | | | |
| 4/21 | | | | | Lecture to community | |
| 4/26 | | | | Meeting of special committee on recovery and reconstruction | | |
| 5/9 | 2nd meeting | | | | | |
| 5/10 | | Whole WG meeting | | | | |
| 5/16 | | | 2nd meeting | | | |
| 5/17-26 | | Initial WG | | | | |
| 5/25-6/7 | | | | | | Public Hearing |
| 5/30 | Meeting on Action Plan WG 2,3 topics | | | Meeting | | |
| 5/31 | Meeting on Action Plan WG 1,2 topics | | | | | |
| 6/3 | 3rd meeting | | | | | |
| 6/6 | 4th meeting | | | | | |
| 6/7 | 5th meeting | | | | | |
| 6/13 | | | 3rd meeting | | | |
| 6/24 | 6th meeting | | | Reports from the special committee | | |
| 6/27 | 7th meeting | | | | | |
| 7/3 | | | 4th meeting | | | |
| 7/4 | | | | Meeting | | |
| 7/12 | 8th meeting | | | | | |
| 7/16 | | | 5th meeting | | | |
| 7/19 | The Recovery and Reconstruction Plan of Ojiya has been published. | | | | | |

Coordination of the Drafting Committee was also managed by the Policy Working Group. The process for making the Action Plan and formalizing the draft plan will be shown in **Table 4.**

## 5. HOW THE IMAGES OF STAKEHOLDERS ARE COMPILED INTO THE PLAN

In the previous chapter, the planning process was summarized from the viewpoint of making a plan feasible and effective. This chapter discusses another point in planning, which is how successfully the images of stakeholders are compiled into a plan.

The first step of participatory planning is "Idea Generation." Through this process, imagined visions and ideas of stakeholders transformed into a statement and shared among stakeholders. The "Idea Generation" process was managed through various systems: 1) Submitting their ideas and visions on recovery and reconstruction to the planning body, the municipal government; 2) Participating in planning workshops; and 3) Participating in community meetings held in their neighborhood community. Ideas on the recovery and reconstruction of the community were gathered through six occasions. **Table 5** shows the number of ideas generated on each occasion. A total of 1,690 ideas were generated from stakeholders.

**Table 5.** Idea Generation

| Idea Generation | Number of Ideas |
|---|---|
| The 1st Citizen WS: Future Vision of the | 110 |
| The 1st Citizen WS: Status Analysis | 445 |
| Ideas submittted to the city government from Stakehokders | 148 |
| Ideas of Administrators | 448 |
| The 1st Administorators WS: SWOT Analysis | 341 |
| Prefecture Government's Recovery Vision | 6 |
| The 2nd Citizen WS | 192 |
| Total | 1690 |

The second step of participatory planning is "Structuralizing Ideas." Their visions and idea collected through the "Idea Generation" process need to be structured as a plan. In the case of Ojiya planning, generated ideas were organized from various view-

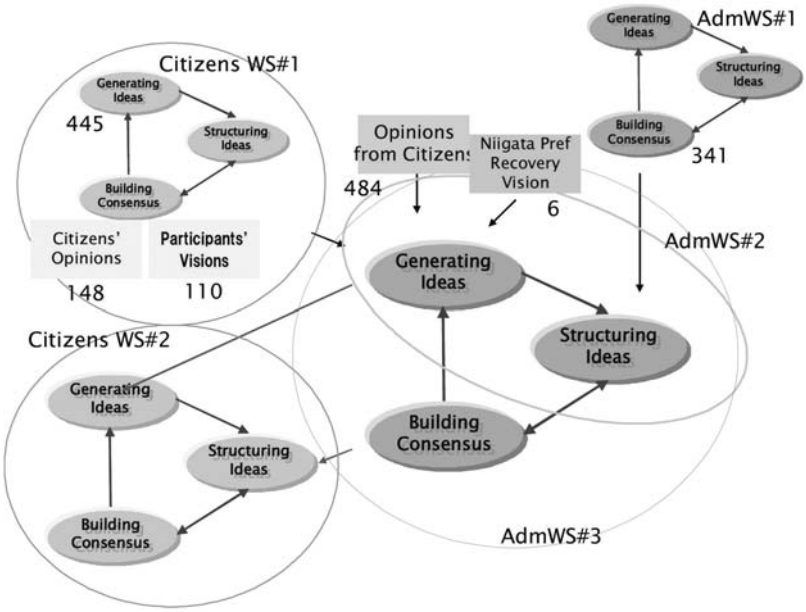


**Fig. 7** How the ideas of stakeholders were compiled into the plan

points comprising 1) present situation analysis, 2) abstractness of ideas, which means sorting ideas using a means-and-end relationship, and 3) priority for implementation.

The final step of participatory planning is "Building Consensus" on structured ideas. Consensus building on the structured results was conducted at the end of each workshop by obtaining the approval of participants of the workshop.

By going through these steps several times, a recovery and reconstruction plan of Ojiya City was established. The following chapters will discuss how two aspects of planning, manageability and participation, were secured in the planning process. **Fig. 7** shows the process on how ideas are compiled into the plan.

All the generated ideas and the results of each workshop were handed over the next workshop and used as a kick-off point of the workshops. All 1690 ideas were structured in the plan and the Ojiya Recovery and Reconstruction Plan was published on July 19, 2005, 8 months later of the event.

## 6. DISCUSSION

This paper introduces how the 1690 stakeholders' ideas on recovery and reconstruction of the community were summed up into the plan according to a strategic planning framework from the viewpoints of 1) how manageability and effectiveness of the plan were secured, and 2) how successfully various visions and ideas of stakeholders were compiled into the plan from a case study in Ojiya recovery and reconstruction planning.

There are several future challenges of this planning scheme. One is how performance measures of the plan will be developed. In this case study, we failed to set performance measures of the plan because we could not reach agreement with the city government that had performance measures. If performance measures are set, we should develop a way measuring them. Another issue is how we can evaluate the advantages of this planning scheme. These future challenges will be discussed in another paper.

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To Ojiya City Government

To workshop participants

I hope Ojiya City would recover from the disaster and be a better community than before by accomplishing visions described in the plan.

## REFERENCES

Burby, J., Raymond Ed. (1999) Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities, Joseph Henry Press book.

Hoch, C.J. ed. (2000) The Practice of Local Government Planning, pp.25-26, International City/County Management Association.

Hayashi, Haruo (2000) Inochi wo Mamoru Bousai Gaku, Iwanami Press (in Japanese).

Mammen, David (2005) Recovery: Lessons from New York and 9/11/01, Proceedings of the 1st International Conference on Urban Disaster Reduction, CD-ROM.

Ojiya City: Ojiya Recovery and Reconstruction Plan, Ojiya City, 2005.