

# IMPROVEMENT OF WASTE ADMINISTRATION BY NEW PUBLIC MANAGEMENT

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**ABSTRACT :** As the application of NPM in waste administration branch this paper proposes a new waste management method in order to increase the efficiency of resources and reduce the quantity of waste. First the matrix method is suggested which comprehensively consider and integrate the proposals of different government departments. Moreover the inhabitant's attitude toward the new waste management measures was investigated. Based on the investigation the evaluation function was made, which include three elements: necessary budget, the effect of cost decrease and the environmental burden decrease. The optimal method of budget allocation to maximize social welfare is proposed under the condition of limited budget by the evaluation function. By applying this system further local governments will be able to determine their adequate service level and budget size.

*Key words :* NPM, Countermeasures matrix, Evaluation function, Budget portfolio

## 1. BACKGROUND OF THE RESEARCH

There are many administrative services that a country requires the execution of the fixed office work by the statute, which a local government provides it for the citizens. However, the authority which how to spend a tax is decided as at present shifted from the country to the local government. Because, how to spend the most efficient tax varies in the area. The local governments of about the half of the whole country are the small scale self-governing of the population under ten thousand people, and holds very severe financial conditions. Therefore, a future local government must deal with the budget distribution of the minus based on the distribution of the limited budget and the budget reduction. But, it is difficult to get the unified agreement of the method that the most efficient tax is spent in the society that value diversifies. Therefore, a local government is required to provide a service efficiently based on the individual judgment as a synthetic administrative subject of the area.

Nowadays New Public Management (NPM) system is being recommended to be applied in local governments in Japan with the purpose of improving administrative efficiency. As the application of NPM in waste administration branch this paper proposes a new waste management method in order to increase the efficiency of resources and reduce the quantity of waste.

## 2. THE POLICY EXAMINATION BY ORGANIZATION CROSSES

### 2.1 The subject of the administration in efficiency

From now on, the local governments will have to provide

an administrative service effectively and efficiently by making use of resources which is a limited budget and talented person. But, the plan decision of the waste administrative service is decided along the form which is the contents to explain prescribed by the notification. In other words, it aims to carry out a decided policy and it doesn't have a clear standard for a judgment which is "What is being looked for as a public policy?" until now. It can't think that the examination of the waste administration which is efficient and effective in a characteristic between various areas. It is not easy to keep providing the administrative service which coped with the needs of the inhabitant who diversifies by making use of limited resources effectively. However, a local government is indispensable to the individual efficient administrative management system to execute an efficient budget. A local government must have goal and find a policy independently.

Actually, the amounts of waste treatment decrease temporarily by the countermeasure of the separate of the resources trash and trash bag charging (figure 1). But, the countermeasures were enforced with the neighboring local government in the intention decision system of one way throughout vertically into divided administration. Therefore, it can think that the amounts of waste treatment were decreased by the amendment of the law system. It is hard to say as the result which a local government itself had a critical mind to and which it grappled with the problem of the amounts of waste treatment. The structure that policies can be examined in each local government is necessary to keep providing an efficient administrative service.

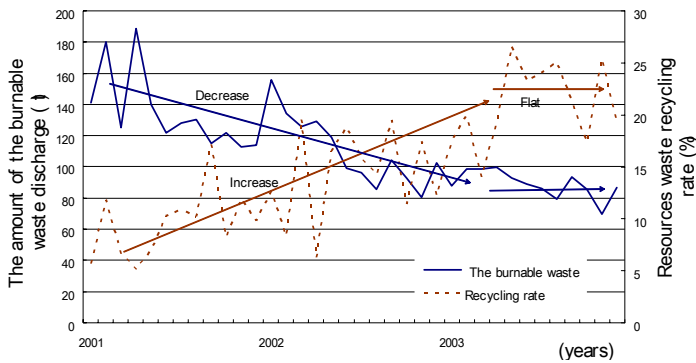


Figure1. The change of waste (Month value)

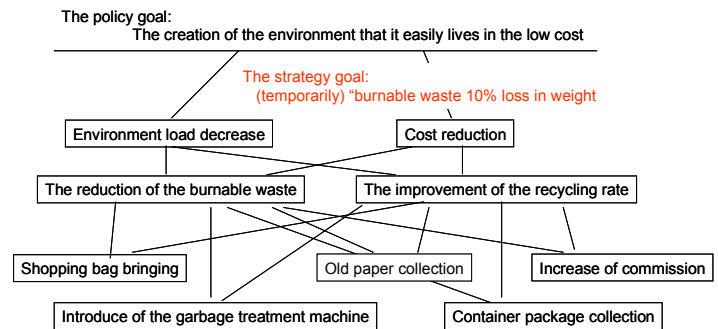
## 2.2 An explicit strategy of target and Countermeasures matrix

The structure of the administrative execution doesn't have a clear standard for a judgment which is "What is being looked for as a public policy?" until now. Therefore, it is important for a local government to do not only business is executed along the uniform standard but also they must have goal and find a policy independently. This research was done by adopting the intention decision system through section crossing in "A study of Structuring of New Management System for Local Governments in Japan" which is the check of the whole business system of the local government.

Furthermore, it can think that a cooperation system is necessary to carry out waste administration with all administrative sections. Because, if the countermeasure which makes garbage compost is carried out, connection with the agriculture administration is necessary to think about how to use compost. For the reasons mentioned above, they must examine that decision countermeasure for the various waste plans between all administrative sections.

First, it is important to have a strategic goal, so it was set up temporarily "burnable waste 10% loss in weight" in this research. Then, strategic goal is materialized on the logical study. So burnable waste 10% loss in weight means Waste treatment cost reduction and environment load decrease. And this goal begins to lead countermeasures by breaking down. A figure 2 showed this causal relation clearly. The purpose of this paper was to improve the intention decision process of one-way. The examination of the waste administration along the thought of NPM was done in the organization system that every countermeasure can suggest by administrative sections. On this occasion, the countermeasure plan turned to the strategic goal achievement was contributed and shown in

the table 1. Every projects or policies of each administrative section for each strategic goal in the matrix were investigated individually. Every countermeasure suggested by administrative section were logically identified how to contribute to the final goal. The concept of this research can say that the materialization of strategic goal and policies examination is



done by administrative section on countermeasures matrix.

Figure2. The materialization of strategy goal by the logical study

Next, an evaluation function is made from the cost and the effect by the countermeasure execution. An efficient policy choice toward the strategic goal achievement and budget distribution are decided by using this evaluation function. As a result of making an evaluation function, an intention decision process can be presented easily. It can become the system that responsibility for an explanation can be fulfilled. Every administrative section at the beginning has to consider whether they have any countermeasures for the strategic goal with their resource and personnel and budget. However, a problem in the countermeasures plan examination process becomes evaluation only in the proposed countermeasures. Because, it has the possibility that other countermeasures plan this is efficient and effective for the strategic goal achievement. Therefore, countermeasure development is restricted by the staff member's proposal ability. In other words, it decides whether an efficient and an efficient administrative service can be provided. They must consider that the problem is dissolved by sharing of the information and needs investigation in all administrative sections.

## 3. THE EVALUATION FUNCTION OF SOCIAL BENEFIT

Table1. Countermeasures matrix

Strategic Goal	Div.	General affairs	Public Welfare	Planning	Construction and other Industries	Education
burnable waste 10% loss in weight		<ul style="list-style-type: none"> <li>Introduction of the garbage treatment machine in restaurant</li> </ul>	<ul style="list-style-type: none"> <li>Introduction of the garbage treatment machine</li> <li>Examination of the collection</li> <li>Shopping bag bringing</li> </ul>	<ul style="list-style-type: none"> <li>Publicity work</li> <li>Classroom to make compost</li> </ul>	<ul style="list-style-type: none"> <li>Utilization of the compost</li> </ul>	<ul style="list-style-type: none"> <li>Introduction of the garbage treatment machine in school</li> </ul>

### 3.1 Investigation of each countermeasure

The evaluation function is made from the cost and the effect when each countermeasure was enforced. Based on the investigation the evaluation function was made, which include three elements: necessary budget (X), the effect of cost decrease (C) and the environmental burden decrease (E). The evaluation function (F) can lead by using these three functions.

The evaluation function made that the cost and the effect are predicted when each countermeasure was enforced, so the countermeasure evaluation can be choosing the most suitable thing. The evaluation function of social benefit is the evaluation function gets F by pulling X from C and E. The evaluation function calculation process of the diffusion of the garbage treatment machine which is one of the countermeasure plans is written in the following.

### 3.2 The evaluation function computation of the garbage treatment machine by electromotive style diffusion

Generally the report that garbage occupies about a half is made by waste formation about the home waste. It gets cooperation in the actual local government, and this research does an examination. The burnable waste of 686 kg per year, household is almost discharged in the public office of the research object. In other words, it supposed that the garbage of 686 kg per year, household could decrease by the garbage treatment machine. The household which purchased the garbage treatment machine is subsidized twenty thousand yen by the public office. However, the user total of it is only 13 households, so the countermeasure plan propose that the burnable waste can be reduced by the diffusion of the garbage treatment machine. Demand function was derived by asking citizens how much they were willing to pay for garbage treatment machine, and the countermeasure evaluation is made.

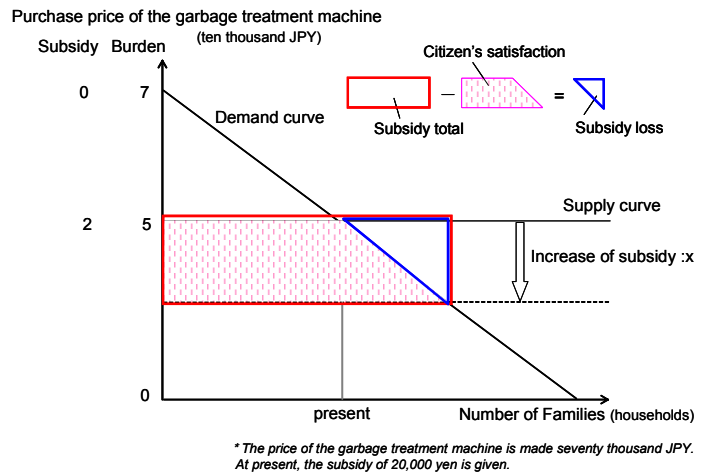


Figure3. The countermeasure cost by the subsidy

The countermeasure cost has two ways of thinking (the figure 3). You have the two ways of thinking. If the local government pays subsidy “X” for a person, total amount of subsidy as the countermeasure cost is subsidy total. If they take into account of the benefit of the citizen’s satisfaction that the garbage treatment machine can be purchased cheap, the countermeasure cost is subsidy loss in the figure 3.

The cost reduction function (“X or T.S= necessary budget”) was indicated at the upper left of the figure 4. User of the garbage treatment machine increase in accordance with increase of the subsidy. Effect function could be estimated like at the lower left of the figure by the diffusion of the garbage treatment machine. The decrease of the treatment cost “C” is result by the burnable waste can reduce. And it can get the environmental burden decrease “E” by the amounts of burning decreasing. It could get the evaluation function “F” by the diffusion of the garbage treatment machine from cost reduction function and effect

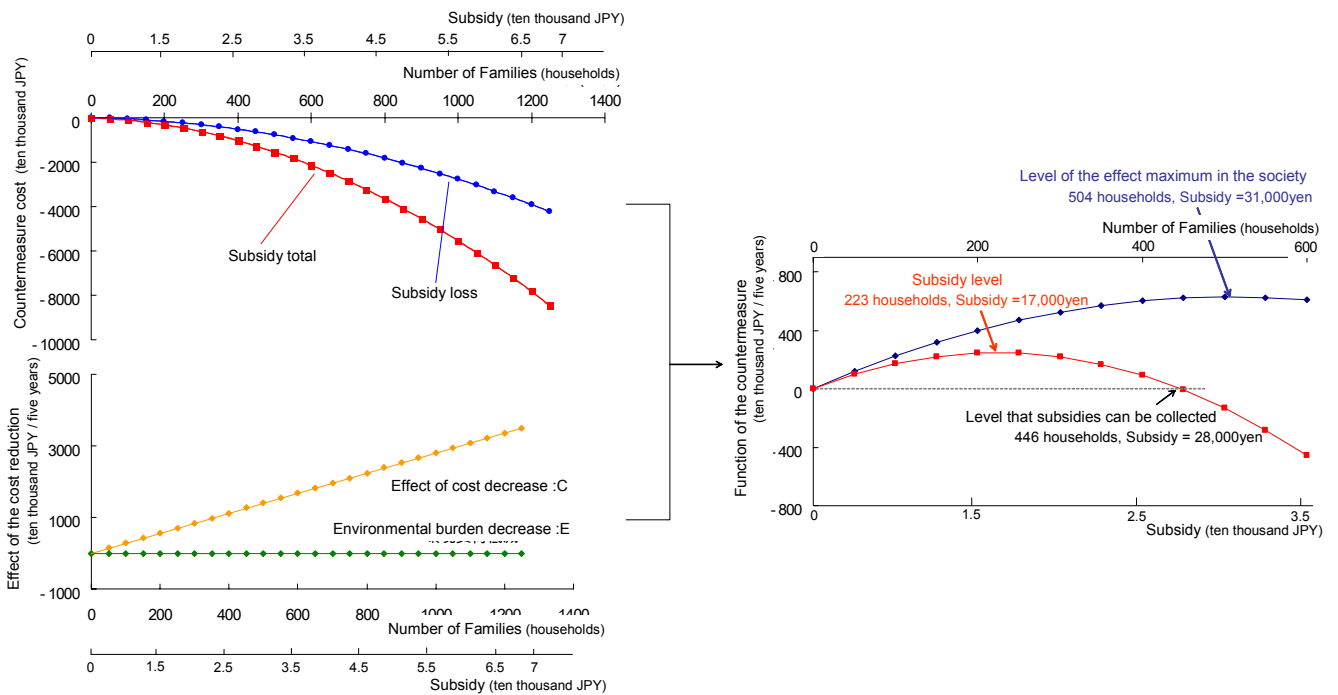


Figure4. The evaluation function by the diffusion of the garbage treatment machine

function (figure 4). Therefore, the subsidy level that effect becomes the biggest can be found from the evaluation function. Furthermore, it can be known the level that subsidies can be collected by the evaluation function.

### 3.3 Increase of commission

At present, citizen must purchase a waste bag of 15 yen to take out waste. The increase in price of the waste bag commission was examined toward the strategic goal achievement. It asked how much the trash bag commission could be borne by the questionnaire. It got the cooperation number of households when raised the price of the commission in the d yen (figure 5). It had effect on waste loss in weight by the increase in price referred to the past research that waste of 0.262% can be reduced when 1% of the prices are expensive by Osaka Prefecture waste loss in weight, recycling promotion conference. Then, an evaluation function (figure 6) was found from the effect, and the most suitable commission price was examined. Citizen didn't have discontent, and the commission that effect became the biggest found out that it was 30 yen. It can explain to the citizen about commission price selection process. But, a loss in weight rate by the increase in price is supposed. There is a subject that whether questionnaires result is trustworthy.

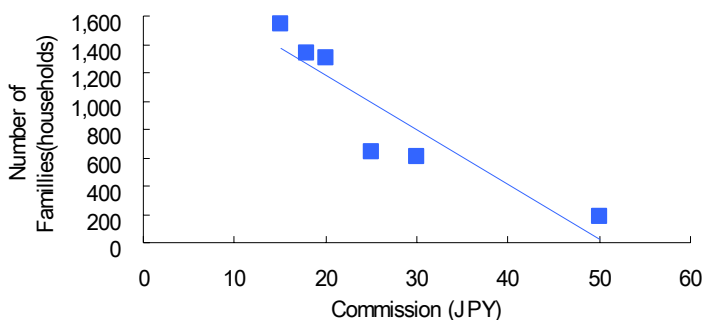


Figure 5. Demand function of increase of commission

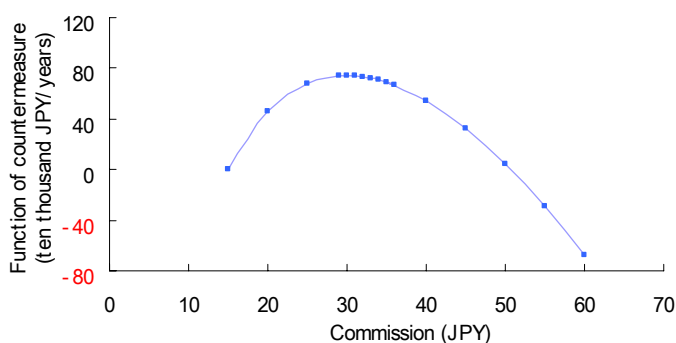


Figure 6. The evaluation function by increase of commission

### 3.4 The subject of marketing

The point of the questionnaire was to grasp the citizen's request quantitatively. It considered that demand for the administration could be grasped from the citizen's consc-

iousness. However, it can think that there is an error by the recognition of the way of citizen's separating. An evaluation function must be careful to have the uncertain of the human action. There is a subject of the marketing. It can be used how to think about evaluation function. It can get the evaluation function that reliability is high by the questionnaire style that the result which was suitable for the actual condition can get.

## 4. THE EXAMINATION OF THE OPTIMIZATION

A countermeasure choice is done by the evaluation function. There are three steps of the countermeasure choice. The policy choice that an evaluation function became the biggest was asked in each step. The followings are contents of an examination of each stage.

- STEP1: The countermeasure evaluation of independent.
- STEP2: The countermeasure evaluation when there is a restriction of budget.
- STEP3: With weight to do the countermeasure evaluation.

STEP1 thinks where is the biggest in the evaluation function. Therefore, the most suitable answer of the budget of each countermeasure is decided. But, this countermeasure choice can be said as the examination when there is no restriction of budget. They must do the choice of the policy on the range of the limited finance when there is a restriction of budget. So, STEP2 does the countermeasure choice when there is a restriction of budget. This step examines whether the strategic goal can be attained in efficiently and effectively. At the end, a countermeasure choice is examined in consideration of the management policy. Countermeasure choice was examined with STEP1 and STEP2 in this research.

### 4.1 STEP1: The countermeasure evaluation of independent

A countermeasure is classified.

- There is no investment.
- Income can be anticipated.
- There is investment.

The countermeasure evaluation which becomes the effect maximum of each countermeasure is shown in the table 2. The countermeasure which investment isn't necessary is only enforced about shopping bag bringing and increase of commission. At the same time, income can be anticipated with increase of commission. And old paper collection, container package collection and the diffusion of the garbage treatment machine are the countermeasure which investment is necessary. The present collection number of times shows a maximum in the container package collection, there is no effect even if investment is done. It decided to be the investment level which had been already the most suitable. Therefore, the countermeasures that the change in budget is possible are old paper collection and the diffusion of the garbage treatment machine. The examination of two countermeasures when there is a restriction of budget was done in STEP2.

**Table2.**The optimization of each countermeasure evaluation on

		The countermeasure of the effect maximum	Necessary cost :X (ten thousand JPY)	Function :F (ten thousand JPY)
Shopping bag bringing		54 thousand sheets reductions	0	24
Increase of commission		Fee of 30 JPY	0	75
Container package collection		4times	550	-45
Old paper collection		8times	250	1,570
Introduce of the garbage treatment machine	Countermeasure cost is subsidy loss	504 households (subsidy31,000JPY)	1,560	630
	Countermeasure cost is subsidy total	223 households (subsidy17,000JPY 1)	380	250
The effect maximum when Countermeasure cost is subsidy loss			2,360	2,254
The effect maximum when Countermeasure cost is subsidy total			1,180	1,874

verification and improvement about that effect and the subject. Then, it is developed into the system which can get the proper service level of the local government and a financial scale.

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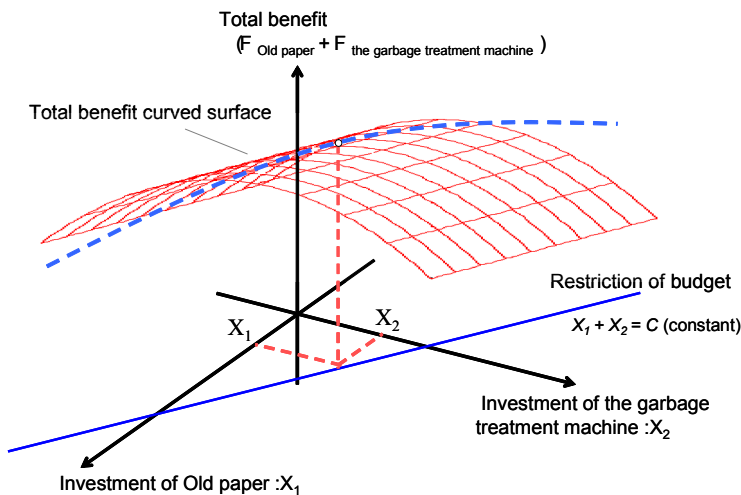
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**4.2 STEP2: The countermeasure evaluation when there is a restriction of budget**

A total benefit curved surface can be drawn from the evaluation function of two countermeasures (figure 7). The budget distribution that a total benefit curved surface becomes the biggest inside the conditional range of the budget is done. It was looked for by the combination.

They were found out that the strategy goal could be attained in the policy evaluation which got it with STEP1, STEP2.

The countermeasure evaluation of attaining the strategy goal only with the diffusion of the garbage treatment machine can be examined by evaluation function. The optimal method of budget allocation to maximize social welfare is proposed under the condition of limited budget by the evaluation function. The evaluation function made possible not only the intention decision can be used as judgment material where it does but also the system that responsibility for an explanation is fulfilled easily.



**Figure7.**The countermeasure evaluation when there is a restriction of budget

**5. CONCLUSION**

New budget allocation for waste disposal as a consistent of this new management system was suggested to be applied in a small local government. From now on, I will have to do