THE COST COMPENSATION AND MEASUREMENT OF CONSTRUCTION WASTE IN CHONGQING AREA AS AN EXAMPLE

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Abstract: in recent years, the production of construction waste is huge, the government give a high attention of the construction waste, make it necessary to publish relevant policy of economic support. At present, the construction waste management is costly, forcing developers at the risk of being fined prefer to illegal dumping, so the government for economic compensation of construction waste management cost is the most effective and direct incentives. Taking Chongqing as an example, we compensate the cost of construction waste management for these three type(landfill disposal, recycling, renewable use).

Key words- Compensation, landfill disposal, recycling, renewable use.

I. INTRODUCTION

With the acceleration of China's industrialization and urbanization, the construction industry develops rapidly, and the corresponding construction waste also increases, construction waste management is costly, the majority of construction waste of China is still a simple landfill, not only destroys the environment, but also take up much land resources, and it's costly for formal way of three kinds of typical construction waste (landfill, recycling and renewable use) .So the government compensate the construction waste management is a direct and effective incentive measures, but the government can't compensate all of it due to the limited funding, contractor should also pay a certain amount of construction waste management costs.

II. COST ESTIMATE OF CONSTRUCTION WASTE MANAGEMENT TAKING CHONGQING AS AN EXAMPLE

Taking Chongqing as an example, we disposal 1t construction waste as a unit cost to calculate, and the measured parameters based on the literature [1]

A. *Landfill Disposal*

1) the collection, transportation and storage;

2) transport to nearby landfills;

3) pay entrance fee to the landfills;

$$C_{TM}=C_A+Q\times R_{TYS}\times TYS\times D_{TM} +Q\times R_{TM}$$
$$=70+1\times30\%\times3.36+20+0+1\times2.5$$
$$=92.66RMB/t$$

Among them:

C_A = total cost of construction waste collection, transportation and storage

Q = the weight of the building waste (Kg)

R_{TYS} =unit transportation cost of construction waste to landfill (RMB/kg/km)

TYS =the percentages of total construction waste for landfill (30%)

D_{TM} =the distance to landfill disposal (km)

R_{TM}= the unit cost of landfill disposal (RMB/t)

B. *Recycling*

1) the collection, transportation and storage;

2) transport to the nearest recycling plant;

3) pay entrance fee to the recycling plant;

$$C_{HS}=C_A+Q\times TRC\times R_{TRC}\times D_{HS}+Q\times TRC\times R_C$$
$$=70+1\times28\%\times3.36\times15+0+1\times28\%\times0$$
$$=84.11RMB/t$$

Among them:

R_{TRC} = unit transportation cost of construction waste to recycling Plant

TRC =the percentages of total construction waste for recycling (28%)

D_{HS} = the distance to construction waste recycling plant (km)

R_C = the unit cost of recycling (RMB/t)

C. *Renewable Use*

1) the collection, transportation and storage;

2) transport to the nearest plant for renewable use;

3) processing and renewable use of construction waste;

$$C_{ZS}=C_A+Q\times RZS\times R_{TZS}\times D_{ZS}+Q\times RZS\times R_{JG}-B_{RU}$$
$$=70+1\times0.28\times3.36\times15+1\times0.28\times21.3-65$$
$$=25.08RMB/t$$

Among them:

D_{ZS} = the distance to construction waste renewable use

plant (km)

RZS = the percentages of total construction waste for renewable use (28%)

R_{TZS} = unit transportation cost of construction waste to renewable use Plant

R_{JG} = the unit cost of renewable use (RMB/t)

III. MEASUREMENT MODEL OF CONSTRUCTION WASTE MANAGEMENT COST COMPENSATION

We analyze the construction waste management cost and give cost formulas to those three kinds of construction waste management (landfill disposal, recycling, renewable use). Supposing that the government compensation standard of construction waste disposal for contractor is X, based on practical situation of construction waste management costs by the contractor, the government budget constraint conditions is the limited compensation standard :$X\times Q\leq C\times Q-Z\times Q+Y$.

Among them, taking X as the compensation standard; taking Y as the financial resources that the government can use in construction waste treatment , taking Z [2] as the contractor's willingness to pay (in the form of questionnaire survey take its average), taking Q as an average yields of construction waste, taking C as unit processing cost.

When the government financial resources is weak, then Y = 0, so only can the government pay the cost of construction waste management to compensate the difference between the values through contractors maximum willingness, That is: $X\times Q\leq C\times Q-Z\times Q$; When the government financial resources are rich, then Y > 0, so the government can use some money to compensate Y, that is::$X\times Q\leq C\times Q-Z\times Q+Y$。In both cases, simplify the constraint is: $X\times Q\leq C\times Q-Z\times Q+Y$。

Assuming that the government's financial resources used in construction waste management is weak taking Chongqing area as an example, then Y=0, so only can the government pay the cost of construction waste management to compensate the difference between the values through contractors maximum willingness, that is: $X\times Q\leq C\times Q-Z\times Q$, then the compensation standard is :$X\leq C-Z$ According to the results of the measurement area in Chongqing, construction waste landfill 1 t cost is about 92.66 RMB, the compensation standard is: X ≤92.66- 67.54 = 25.12RMB/t; Construction waste recycling 1t cost is about 84.11RMB, the compensation standard is: X ≤ 84.11-67.54 =16.57RMB/t; Construction waste renewable use 1t cost is about 25.08 RMB, X ≤ 0. It shows that the contractor itself can gain profit in this way, the government don't need subsidies

IV. SUMMARY

Most of the contractors are willing to pay the cost of waste management based on the literature survey, and I establishes the compensation cost measurement model of the construction waste management. According to the model of Chongqing region, It's suggested that the government compensation standard is 25.12 RMB/t when construction waste landfill 1t; It's also suggested that the government compensation standard is 16.57 RMB/t when construction waste recycling 1t; Finally the government don't need to take the compensatory measures when construction waste renewable use 1t due to the contractor can profit itself.

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