Industrial and Commercial Depth-Damage Curve Assessment

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Abstract: - Because of geographic location, Taiwan encounters frequent flood attack due to typhoon or storm events. Flood hazards usually cause major damage of assets and casualties where with the high density of population and economical activities. Flood risk management becomes one of the important tasks for government. The damage assessment is the basis of flood risk management and disaster mitigation. The depth-damage curve has been employed as a major tool for assessing flood damages. Because flood damages may depend on the types and uses of structures as well as the content in it, the depth-damage curves will have different characteristics varied with land uses and region. This paper develops depth-damage curves for industrial and commercial sectors based on the damage data collected after the flood event of Nari typhoon (2001). Because different economic activities may possess different damage characteristics, the industrial and commercial activities are categorized as manufacturing, service, wholesale, and retail. Each category is further divided into two sub-groups of small and large-scales. A depth-damage relationship is developed for each category and subgroup for application in assessment of regional flood damage.

Key-Words: - Flood, Flood Damage, Damage Assessment, Depth-Damage Curve

1 Introduction

Taiwan, at the bordering area between Pacific Ocean and Asian Continent, is often seriously influenced by its surrounding ocean and atmosphere. Besides the natural environment factors such as season wind, its latitude, landscape and etc has made it vulnerable to natural disasters. There is usually serious downpour between May and June, typhoons between July and September. According to Interior ministry, the statistics show there are totally 232 natural disasters such as typhoon, flood, earthquake, tornado between 1958 and 2004. The average number of disasters is 494 per year, including 168 typhoons and 42 downpours. The average rate of flood is 4.47 per year. Recently owing to frequent rampancy of typhoon and flood, resulting in great economic damage is, this lead to government and public‘s attention on water damage prevention and risk management.

A complete flood management and mitigation system(Grigg 1996) comprises a hydrological module(Li et al.,2008), hydraulics module (Nsom et al.,2008), economic module for damages assessment and a risk analysis process(Li et al.,2008). Although many studies have been made in hydrological and hydraulic aspect, few focused on flood damage assessments in Taiwan. Since flood damages vary spatially and closely related to socio-economic characteristics, it is very regional specific. These researches focus on flood damage functions for assessing flood loss in Taiwan. For those reasons, this study plans to establish the Industrial and Commercial flood damage functions, and the result can be considered as the reference of regional risk management.

The frequent traditional means of flood damage prevention include bike-building, river- broadening, channel –changing, flood diversion, and flood-releasing. But with the rising sense of environmental protection those non-engineering methods, such as landuse plan and control or fold insurance, are also presented for discussion. Regardless of the engineering or non-engineering methods, both need invest capital so it’s necessary to make benefit-cost analysis to decide the method to adopt. Regional flood damage evaluation will become the necessary supporting information for

decision making before this damage prevention methods are adopted.

The damage can be divided into the tangible and intangible ones. The intangible damage is like environmental quality, social well being and aesthetic values very difficult to identify their monetary value. Although it can be valued by questionnaire, those results are too subjective. Tangible damage is can be further categorized as direct damages and indirect damages. Direct damages are the damages like buildings, furniture, decorations, cars, motorcycles, utilities, and the broken of road directly from the disaster itself. Indirect damage, such as cost of traffic routing and shut down of business, etc. , are those damages induced by the direct damages. Because it is very difficult to identify their monetary values, the indirect damages are usually estimated by percentage of the direct damages. (Kates, 1965)

The common ways are aggregate formulas, historical damage curve, depth-damage curve, and regional damage assessment. Each way has its advantage and disadvantage. (Chang et al.,2008) More often used is depth-damage curve. (Arnell, 1989; USACE, 1999, Goldman; 1997, Boyle, Tsanis et al.; 1998, Berning et al.; 2000, Berning, 2001; and Dutta, Herath et al.; 2003) The concept of depth-damage curve was brought about by White in 1945 earliest. This purpose of depth-damage curve is to describe the connection between the damage and flood depth while the target property is being flooded. This case often ignore the considerations – the speed of flood, the span of flooding, and the accumulate mud by flood. McBean et al. in 1988 think we should consider the other flood effecting factors, such as the flood warning, the flood lead time, and the flowing speed, and on the base of depth-damage curve suggested to modify the weight. However, Grigg in 1996 had the different point that depth-damage curve is still applied to the estimation of flood damage even regardless of the above modification.

There are two ways to found the depth-damage curve– one is to do the statistic analysis by using the data collection of the damage after flood; the other is to do the hypothesis analysis by simulation the flood condition and generate the synthetic depth-damage curve. (Smith, 1994 and Dutta, Herath et al., 2003) U.S. Army Corps of Engineers ever used the 1983's, 1986's, 1995's, and 1996's data collection after the flood which happening in California Central Valley found depth-damage curve. (USACE, 1999) Penning-Rowsell and Chatterton in 1977 divided building into 21 categories, formulating to determine the total 168 depth-damage curves of each type building at two kind of duration and four types of society. The studies about flood depth-damage curve in Taiwan focus on residential area (Chang et al., 2008). Beside residential area, the landuse classifications, such as industrial and commercial area, also need to build the flood depth-damage curve.

Standard Industrial Classification (SIC) is a standard classification of economic activities arranged so that entities can be classified according to the activity they carry out. SIC contains four structure levels. The structure level 1 is Sections which is one-letter alpha code- A to S. The structure Level 2 is Divisions which is 2-digit codes. The structure level 3 is Groups which is 3-digit codes. The structure level 4 is Classes which is 4-digit codes. The classification hierarchical structure consists of "Sections"(19), "Divisions"(89), "Groups"(253) and "Classes"(557). There are a lot of industrial and commercial classifications, and each one has different industry characteristics. However, this classification is not sorted out according to the flood damage potential. Therefore, this study divides the industry and commerce into four Sections, includes manufacturing, wholesale trade, retail trade and service. The manufacturing has machines and tools, original supplies, finished goods and semi-manufactured goods. The companies in the service mainly have machines for official business affairs such as fax-machine, Photostat, computer, etc. The wholesale trade will pile their goods to the higher position, but the placing height of the goods in the retail trade normally does not exceed 2.5 meters so that customers can reach the goods conveniently. Because there are various industrial and commercial classifications, so there are huge differences between every classification and between every producer, if the synthesis is used to set up the flood depth-damage curve of industry and commerce and also it is difficult to set up a representative industrial and commercial classification model. Hence, this study collects Nari typhoon's damage data, includes declaring information of Taipei City, the simulation result of hydraulics module, and investigation about flood range and depth, and also collects the information of address coordinates of Taipei City to establish the relation of industry and commerce flood depth-damage curve.

2 Data Collection and Analysis

The declaration data for business entity loss in disaster of National Tax Administration was the damage declaring information of each industry and commerce's entity loss after suffering from various

kinds of calamities. The reported time, time of suffering from disaster, and type of disaster (such as fire, flood, or earthquake and so on) would be indicated in the declaring information, but the name of the disaster incident would not be indicated. Therefore, while collecting the information, the disaster type and time of suffering from disaster were used to judge whether the information was the disaster damage declaring information of suffering from Nari incident or not. The address of business entity declaring information did not necessarily be the spot of the disaster, but relied mainly on the registered address in the business entity. The spot of the disaster could be not filled in the declaring information. According to the tax staff, who had practical experience, estimated this kind of declaring information accounted for about 20% of the total.

The content of the declared disaster damage that was provided by National Tax Administration included the category code of industry, the institution code, disaster date, the amount of money of declared disaster damage is, the checked and ratified amount of money of disaster damage is, the subject matter that the disaster happened on and profit enterprise address, etc., but the flood depth was not included among them. In order to estimate the possible flood depth of the declared company at that time, the geocoded addresses database of Taipei City Government was used in this study. The declared address information was changed into coordinate system, then X, Y coordinates were utilized to point coverage (as shown in Fig 1). Furthermore, the point coverage was overlaid with the flood range and depth of Nari which were simulated by the hydraulics module (as shown in Fig 2). Then flood depth of each company's declared flood damage was estimated.

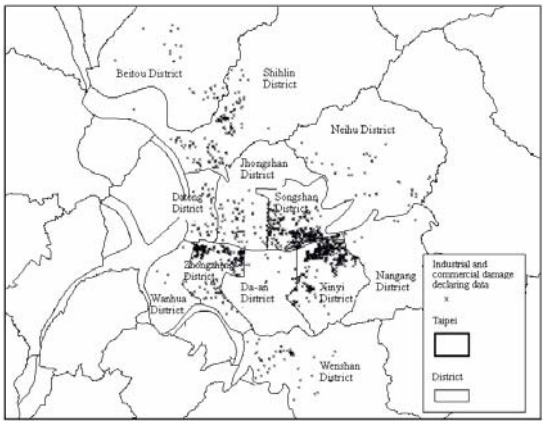
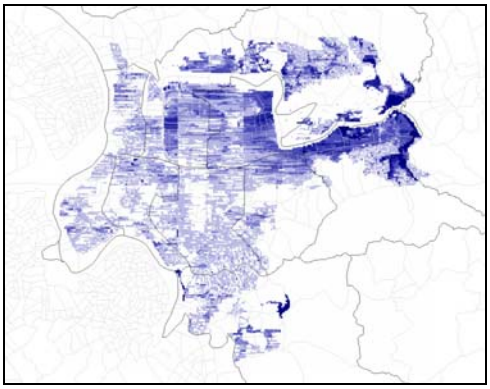


Fig.1 location of industrial and commercial flood damage event



Data Resource Public Works Department of Taipei City Government

Fig.2 flood range and depth simulated by the hydraulics module

On the basis of the consideration of business norm and protecting individual privacy, National Tax Administration did not provide complete address information of the disaster declarer. The last number of the doorplate of the actual address was substituted by X, for example, No.48, 235th Alley, 2nd Lane, Zhongxiao E. Rd, the "No. 48" was changed to "No. 4X". In order to use the obtained address to proceed with orientation so as to estimate that location's flood depth, in this study the hidden doorplate X of the obtained address information was replaced by 5 first to proceed with address geocoding. Then the TM 2° coordinates of business entity were set by the geocoded addresses database. If there was any address that cannot be geocoded, then 4, 6, 3, 7, 2, 8, 1, 9, 0 would be used respectively to try to find out until the address geocoding was completed or until the fact that the geocoded address database could not find the corresponding information was confirmed. The doorplates and addresses of the city areas mostly linked so closely to each other that even though estimated spatial position of the declared information would not be the real position, but at least it would not be too far away from the actual position. For example, the doorplate positions of Xinyi District, which had more serious flood, the address position with doorplate numbers 1 to 10 have 887 in total. In the address geocoding, the possible error distribution of X and Y coordinates (as shown in Fig 3 and Fig 4), the maximum difference of X coordinate was about 92 meters, the minimum is 0 meter, about 4 meters on average, and standard deviation was about 11 meters. The maximum difference of Y coordinate was about 168 meters, the minimum was 0 meter, about 3 meters on average, and standard deviation was about 10 meters. The grid used by the hydraulics module was the 40×40 meters. The above mentioned method was used to complete address geocoding and its possible error, 864 counts (97.4%) of them were the difference was smaller than 40 meters in X

coordinate and 878 data (99.0%) in Y coordinate. Most of the positions were fallen in the same grid. Therefore, the error influence of the estimation of flood depth would be rather limited.

The flood depth and declaring damage information were plotted (as shown in Fig 5). It showed that the changing range of the degree of damage was very large. The money lost was several ten thousands the least, and several ten millions the most. The difference had quite a wide gap. Because the declaration of disaster information used the company as the unit, each industry and commerce's flood damage difference was quite big was because of the size of the company. In the different sizes companies, the same flood depth led to different damage and the difference of each company might quite big. Another reason was the difference of industrial and commercial classification, different industrial and commercial classification had different operating characteristic and equipment (such as machines, material and administrative machines), and therefore the flood damage characteristic would also be different. In order to reduce the variation that was caused by the damage information, and improve the efficiency and credibility of the regional flood damage estimation, the classification would be proceeded in accordance with the industrial and commercial characteristics.

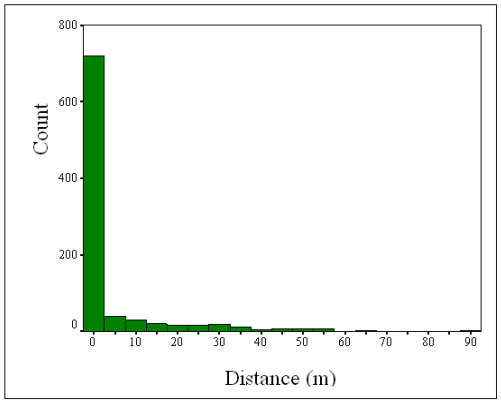


Fig.3 the possible error distribution of X coordinates in Xinyi District

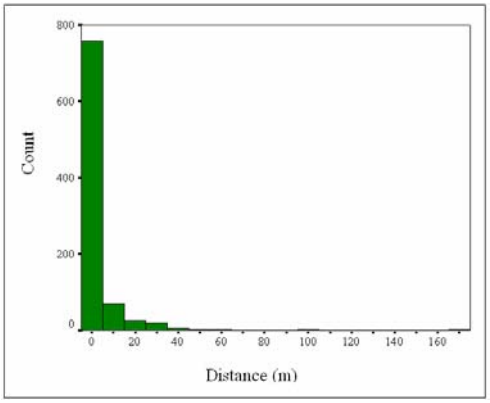


Fig.4 the possible error distribution of Y coordinates in Xinyi District

The declaring information of business entity has standard industry code, in "Net Profit Rate Standard Compilation Table – Suitable for Industry Standard Codes and Written Examination of Expansion", that is stipulated by the tax authority of Taiwan, the declaring information of industry and commerce are divided in accordance with every industry's characteristic, which includes manufacturing, retail trade, wholesale trade, service and agriculture.

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service, are sorted out for the service. The classification was showed as below.

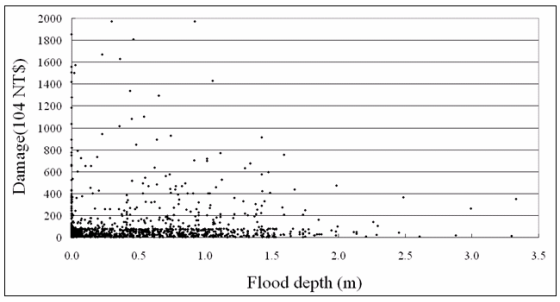

Fig.5 the flood depth and declaring flood damage of industry and commerce

Fig 5 showed that the flood damage was quite wide. Except the difference between different industries, the industry scale had quite direct influence to the degree of damage. In order to cluster all of the collected data, in this study the two-step cluster analysis was used for the data of each classification to exploring cluster analysis. In the analysis, the log-likelihood was used and the result was showed in table 2. Except the service was divided into four groups, the manufacturing, wholesale trade and retail trade were divided into three groups. There was only one count in a group of manufacturing's information and eight counts in a group of wholesale trade and service's information respectively. If the count of data was too few, then the insufficient information was not suitable for further analysis.

Classification	Clustering Number	The Data Number of Each Cluster
Manufacturing	3	1,35,27
Wholesale trade	3	141,128,8
Retail trade	3	22,125,203
Service	4	100,80,33,8

Table 1. Industrial classification

Codes of Standard Industrial Classification			The Categorized of this Study
Sections	Divisions	Description	
A	--	Agriculture	Agriculture
B	--	Mining and Quarrying	Mining
C	--	Manufacturing	Manufacturing
D	--	Water , Electricity and Gas Supply	Service
E	--	Construction	
F	51,52	Wholesale trade	Wholesale trade
F	53,54,55	Retail trade	Retail trade
F	56	Customs Clearance Services	Service
	57	Food Services	
G	--	Storage, Transportation, Postal and Courier Services	
H	--	Financial, Insurance and Real Estate	
I	--	Industrial and Commercial Services	
J	--	Social Services and Personal Services	

Table 2 Industrial classification by Two-step cluster analysis)

3 Building the flood damage curves

This study was based on the previous section's cluster result to focus on the above-mentioned four kinds of industrial and commercial classifications, and then two groups of flood damage data were used to establish the flood depth-damage curve. Next, the flood depth-damage curve of the group with higher damage was called "flood depth-damage curve of the industry with large-scale", the other established damage curve was called "flood depth-damage curve of the industry with small-scale". After clustering, there were 22 counts of data in the retail trade and 33 counts of data in the service. This study did not adopt the follow-up cluster analysis, and this would be elaborate at the end of this section.

After the disaster and damage declaring information was arranged and classified, this study divided the flood depths of manufacturing, wholesale trade, retail trade and service into groups respectively. In order to judge each flood damage data's outliers and extremes, the Boxplot of each group was drawn. The difference (Q3-Q1) between the Boxplot's Q3 and Q1 is the length of the box. According to the definitions of outliers and extreme in Statistics, for data with box length exceeds 1.5 times then it is the outlier, for box length exceeds 3 times then it is the

extreme. After screening out the outlier and extreme, the median, each group's damage data after flood depth clustering, was used in order to proceed with the drawing of each classification's flood damage curve. Theoretically, damage data had been divided and dealt with, so it was not necessary to draw the damage. However, when using in the follow-up, if one of the disaster-stricken family's flood depths was in one of the depth groups, then the median of the group would become the expected value of estimating the flood damage. The curve that was drawn in this study was the trend curve of flood damage and depth, but not the regression line of each median of group. Using each median of group to proceed with regression analysis did not conform to the statistical principle, because that regression line might go through the statistical testing of these medians, but they could not pass the statistical testing of the original data. However, the regression line was still consultable.

In the standard industrial classification system, the manufacturing includes food, textile, paper, chemicals, electrical machinery and electronics' manufacturing. According to the above-mentioned, the manufacturing was divided into large and small-scales. The flood depth-damage curve of larger scale manufacturing showed the trend of logarithmic function (as shown in Fig 6), and the flood depth needed to reach a certain height (nearly more than 15 centimeters) and then the flood damage of that property would start to form. Its reason was because the manufacturing possessed mostly original supplies, finished goods, semi-manufacturing goods, process machines etc., while storing articles or setting up the machines would usually be pad up. Therefore the flood needed to reach a certain depth and then the articles of the manufacturing would be damaged by the flood. So the flood incident that was before the threshold depth of causing damage, this study proposed to estimate the cleansing expenses of that factory as the flood damage of that flood incident. Same method of data analysis could also establish the flood depth-damage curve of small-scale manufacturing and its relation between flood damage and flood depth was similar to the large-scale one (as shown in Fig 7). It showed that the flood depth-damage curve increased with the increase of flood depth, the money of damage showed an increasing trend. The maximum damage of small-scale was less than NT$800,000.

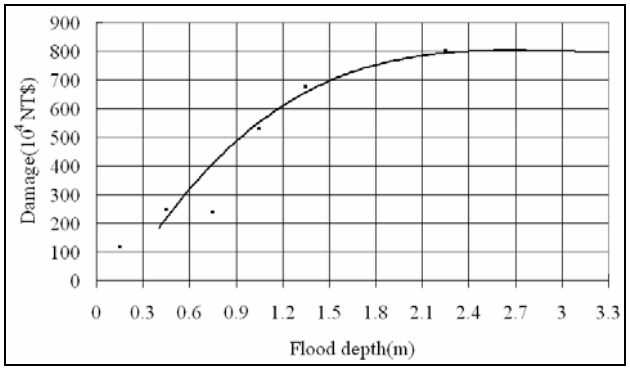

Fig.6 Flood Damage-Depth Curve of Large-scale Manufacturing

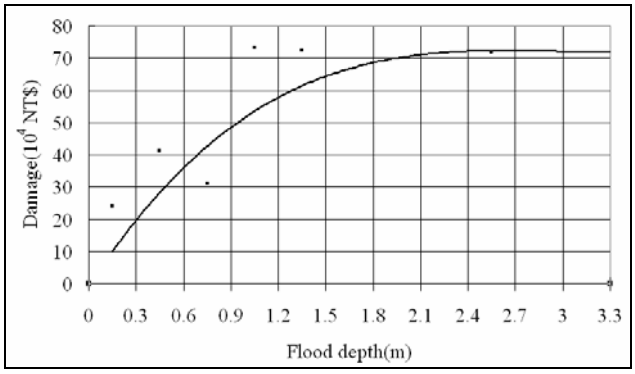

Fig.7 Flood Damage-Depth Curve of Small-scale Manufacturing

In the profit business disaster damage declaring information of Nari typhoon that was provided by National Tax Administration of Taipei City, although the wholesale trade belongs to Section F with retail trade and food services, but because the stock quantity of wholesale trade' goods was more than retail trade, and the safekeeping way did not focus on the ease for the customers to reach, so the goods would be piled to larger height. So part of wholesale trade was classified to the medium class, "Divisions". The flood depth-damage curve of large-scale manufacturing that was established in the same way as mentioned above (as showed in Fig 8), the curve showed that flood depth and damage were directly related. It meanest the damage would increase as the depth increased. Because the wholesale trade usually preserves the goods by piling and the pile height always exceeds 2 meters, and because the city uses lifting equipment for the purpose of goods accessing, the goods will always be placed as high as reaching the ceiling. So the damage curve of manufacturing industry would not show logarithmic function's curve type. Generally, damage curve with logarithmic function would start to become stable when the flood depth has exceeded a certain amount of damage money (as showed in Fig 6 and Fig 7). The

damage of large-scale manufacturing would increase as the flood depth increased. (as showed in Fig 8)

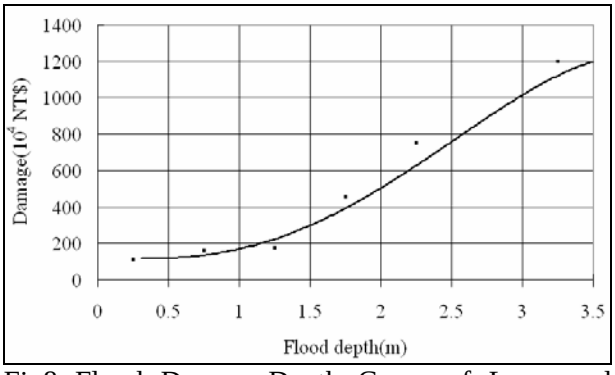

Fig8 Flood Damage-Depth Curve of Large-scale Wholesale trade

The flood disaster declaring information of small-scale manufacturing was arranged in the same manner, and the data was clustered in accordance with the flood depth, the median of clustered data was taken to draw the relation of flood depth and damage curve of small-scale manufacturing. The result showed that the relation of flood depth and damage of small-scale manufacturing did not possess the characteristic of damage being continuously increased that the large-scale possessed, but the normal logarithmic function's trend was shown (as showed in Fig 9). When the flood depth increased, the damage would increase rapidly. Although the speed of damage increasing would gradually slow down after a certain height had been reached, but it would still increase continuously until all goods were flooded. Compared with the damage curve of large-scale manufacturing, the flood damage of small-scale manufacturing increasing rate was relatively lower in the high flood depth. It showed that it has not the damage pattern of normal manufacturing that would pile the goods high up to the ceiling. It might be because the small-scale manufacturing's stock quantity was lower, the flood damage curve gradually tended to be gentle when the flood depth exceeded 2 meters.

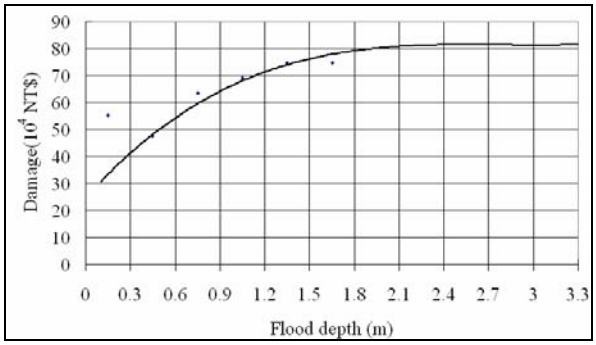

Fig9 Flood Damage-Depth Curve of Small-scale Wholesale trade

For instance, the main economic activity characteristics of the retail trades of department store, grocery, clothing industry lie in selling a small amount of and various articles, though the goods sold are of small amount, often there are goods of different brands that are gathered and sold together in the same place or the building together. Its characteristic is that its goods are placed on the shelves or counters that are not taller than 2 meters so as to help customers take and fetch. So at the beginning of flood, its damage will be accumulated and increased rapidly, but when 1.5-2.0 meters was reached then the stable maximum value would be reached promptly.

The retail trade can also use the flood depth grouping to choose the disaster damage median from the cluster, the flood depth-damage curve of large-scale retail trade and the flood depth-damage curve of small-scale retail trade could be established separately (as showed in Fig 10 and Fig 11). The flood depth and damage of the retail trade showed the trend of logarithmic function, damage increased rapidly at the beginning when the depth increased, until the flood depth had reached 2 meters, the increase of money of damage would slow down.

In this article, the service in the industrial and commercial classification includes the water, electricity and gas supply industry, construction industry, customs clearance services, food services, storage, transportation, postal and courier services, financial, insurance and real estate industry, industrial and commercial services, social services and personal services. The indoor equipment was usually the office furniture (such as desks, chairs and filing cabinets) and the affairs machine (such as computer, fax-machine and photogravure press). The flood depth-damage curves of the large and small-scale of service had been established as showed in Fig 12 and Fig 13.The characteristics of the flood depth-damage curve of the service were same as the retail services'. The curve showed that when the flood depth exceeded 1.5 meters, the

services industry's damage curve tended to slow down as the flood depth increased.

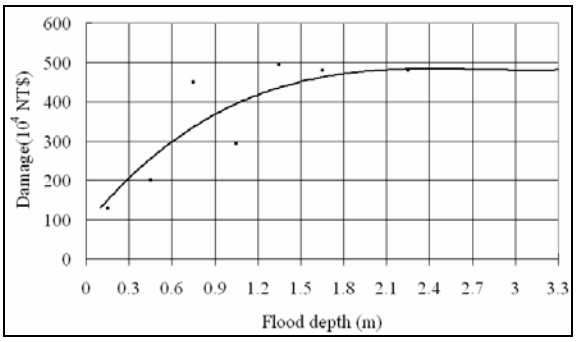

Fig10 Flood Damage-Depth Curve of Large-scale Retail trade

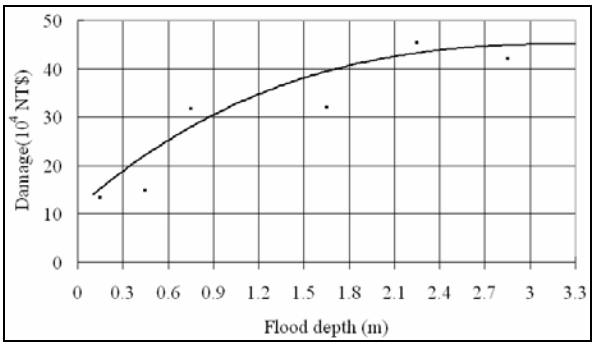

Fig11 Flood Damage-Depth Curve of Small-scale Retail trade

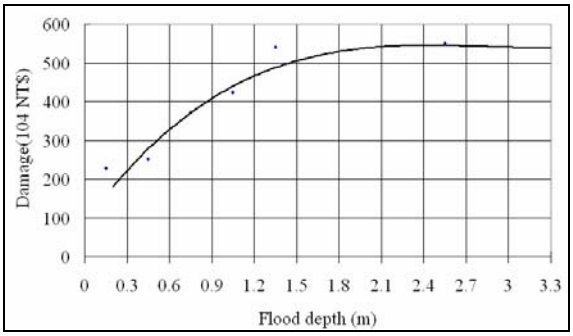

Fig12 Flood Damage-Depth Curve of Large-scale Service

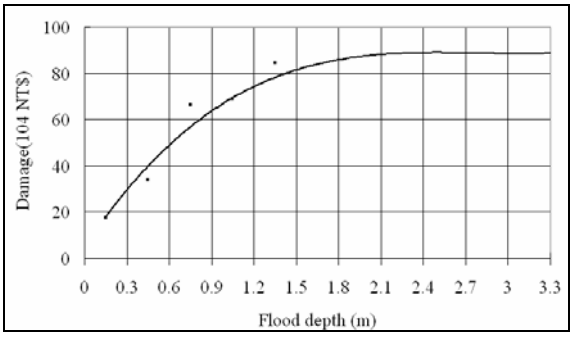

Fig13 Flood Damage-Depth Curve of Small-scale Service

4 Result and Discuss

The variation of flood damage and flood depth data was normally quite big. Except the factor of that the characteristics of each industry and commerce are different, another factor was the difference of industry scale. So after clustering of the damage data in this study, the data were centralized in accordance with the clustering data, each industry was divided into large-scale and small-scale. They were established into large and small-scale flood damage curves respectively. But because in the original declaring damage information, the reference data of industry scope liked the declared company's capital volume, staff number, or total assets, was not provided. However, the result of other studies showed that the upper limit of total value of the damage was usually between 60%-80% (FIA 1970; James 1986; Oliveri and Santoro 2000; Dutta, and Herath, 2003; Carsell, and Pingel, et al. 2004). So when applying it in the follow-up practice, the industrial and commercial survey data could be referred to, and every value of all original supplies and machines that the industry and commerce declared were used in order to judge the suitable large-scale or small-scale curve.

Take manufacturing as an example, upper limit of flood damage of small-scale was about NT$800,000. Supposed that 70% of the total assets was used as the basis of the upper limit of damage is, its average total value could be estimated as about NT$1,150,000. The industrial and commercial survey data of the flood damage region were estimated. The values of original supplies, finished goods, semi-manufacturing goods and machines of the manufacturing that might be suffered from the flood were complied statistics. It would be started with the company with the lowest total value, the trial and error was used to progressively calculate the average total value of manufacturing until the average total value had reached NT$1,150,000. Then the ratio of large-scale and small-scale manufacturing industries could be calculated. While the regional flood damage was estimated, the possible numbers of disaster-stricken companies would be distributed according to the ratio. Take Daan District of Taipei City as an example, the industrial and commercial survey data showed that there were 1012 manufacturing industries among them, the manufacturing was arranged in ascending order in accordance with the above-mentioned assets, the first 711 companies' assets were about NT$1,150,000 on average. Therefore in Daan District of Taipei City 70% of the companies were estimated as suitable for the flood damage curve of small-scale

manufacturing, 30% of them were suitable for the flood damage curve of large-scale manufacturing. When the flood damage in Daan District of Taipei City was estimated, if the estimated number of disaster-stricken companies was 100, then 70 companies would utilize the small-scale flood damage curve to estimate the flood damage , 30 companies would utilize the large-scale flood damage curve to estimate the flood damage. The handling manners of the wholesale trade, retail trade and service were similar.

Currently the flood damage curve was represented by money. Though this study tried to use the damage declaring amount of money to differentiate the flood damage curves of large and small-scale, it was still insufficient to represent all of the business scales. For example there were 22 counts of data after clustering in retail trade, because the quantity of the data were slightly insufficient, hence further analysis had not been carried out. However, as a means of data distribution, the flood damage value that this group of data might establish should be more than the upper limit damage NT$5,000,000 of large-scale retail trade. Obviously this should be another scale of the retail trade's flood damage characteristic. If there were enough data, a retail trade flood damage curve that was above the large-scale one should be able to establish. The service also has a similar situation, but this group's characteristic of the damage data' losing value lies between large-scale and small-scale service flood damage. In other words, if there are abundant data, it would be more ideal to set up a medium scale service flood damage curve. Except depending on the characteristic of damage data directly and then the damage data are clustered and discussed, another feasible research direction would develop the dimensionless damage curve, the total damage percentage and the flood depth curve. If there would be more flood damage data from other regions in the future, then the regional characteristics of flood damage could be discussed. Then the flood damage curve that was established after considering the time and space variation would possess greater application elasticity.

5 Conclusion

This study used the industrial and commercial damage declaring information, that was suffered form the flood damage from Nari typhoon in Taipei City, to carry out the analysis of the relation between industrial and commercial disaster and flood depth. In this study, the characteristics of the flood damage of every industrial and commercial classification would divide the industry and commerce into four kinds, which includes manufacturing, service, wholesale trade and retail trade. The flood damage-depth curve would be established respectively. But because the declaration of disaster damage uses the company as the unit, and often there is sizable difference in the business scale of the industrial and commercial companies. If the collected data was mixed together, then it would lead to the flood damage and depth data was confused and unable to analyze. So this study first carried out clustering analysis for the data, and the companies would be divided into two scales. Then the median could be got according to different flood depth clustering, and each industry's flood damage-depth curve could be estimated. This could provide a basis for the following regional flood damage estimation, and then this could provide the reference for the flood risk management and the relevant strategic decisions.

The flood depth-damage relation curve that was established in this study is in accordance with every industry and commerce's disaster damage data after Taipei City had suffered from Nari typhoon in 2001. The curve was set upon the price base period of 2001, when using in different year, the data should base on the fluctuation of the price index to appropriately adjust them. This could exactly reflect the flood damage at that time.

Every classification's flood depth-damage curve is based on a company as the unit. Every curve has its own suitable flood depth range. For example, if the flood depth exceeds the height of one floor, the exceeding damage of wholesale, retail and service are recommended to estimate by second industry and commerce's flood damage but the manufacturing estimates by complete damage. A part of the damage curves does not start in the origin, which means that there would have damage amount of money only if a certain flood depth has been reached. When the flood depth is lower than the applicable scope, it is more suitable for the wholesale trade, service and retail trade to estimate by the amount of money of cleaning and restoring.

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