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Compensation Valuation for Disasters in Sri Lanka with Reference to Explosion at Salawa Armory in Avissawella

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Abstract

Simply disaster means natural or human caused event that can be negatively affected on social and ecological system. It can be classified under three main groups such as natural, man-made, and technological. The prompt payment of compensation calculation becomes a must in any disaster that destroys or harmfully affects to the man-made assets, human and social capital. Sri Lanka had past experiences on different kinds of disasters and massive time slots including human resources were wasted in calculating compensation due to absence of a proper systematic pathway. This paper mainly focuses on identify a comprehensive methodology for disaster damage and loss assessment for compensation in Sri Lanka. A random sample of 45 residents those who faced to the explosion living in the immediate vicinity of Salawa Armory and 15 professional valuation officers from Government Valuation Department of Sri Lanka were interviewed using a structured questionnaire, in addition observations were carried out at the inspection of damaged properties. The study identified that

economic, environmental and social losses should be added in calculating the compensation other than the value for physical damages. While suggesting a method to calculate the loss of income as an indicator and identifying problems faced by valuation surveyors in disaster valuation, a comprehensive model including pathway guidelines for disaster valuation was developed. It is recommended that a base line information system should be maintained at GN level immediately covering the whole country.

Keywords: Disaster, damages, losses, valuation, compensation

Introduction

Disaster valuation is a critical activity and is highly time consuming. Moreover, resources have to be allocated in assessing the damages. Here, the purpose of the valuation is to get back the people to the pre-disaster position. The main way or indicator which helps to the process is the compensation.

Disasters can be divided into three main groups such as natural disasters, man-made disasters, and technological disaster. The former classification of disasters is related to meteorological, geotectonic, and biological events like floods, droughts, hurricanes, earthquakes, volcanic eruptions, pest attacks, mudslides, and landslides. The latter group includes violent occurrences which are not natural in origin, such as explosions, fires, oil spills, releases of toxic substances, and collapses of dams. Any disaster destroys or harmfully affect to the man-made assets, human and social capital. These occurrences may also seriously influence to the natural capital. Environmental damages may either occur because of negative environment (quantity or quality) changes, the (temporary or permanent) inability to exploit environmental services and the increased costs of services (Dosi, 2001).

However, disasters can be assessed in many ways considering number of deaths, number of buildings collapsed, kilometers of roads destroyed, loss of revenue due to the disruption of economic activities, etc. Ideally, all these elements should be incorporated in a total cost assessment, but practically only direct and tangible costs are considered to estimate the economic losses(Dosi, 2001)(Guynhanh, 2015).According to United Nations Office for Disaster Risk Reduction (UNISDR), there are 346 disasters reported, 22 773 people dead, 98.6 million people affected, and US$ 66.5 billion economic damage reported in year 2015. When it comes to Sri Lankan context only physical factors are considered for the calculation of compensation. In order to avoid the agitation of people affected, a stepwise reasonable pathway with more accurate information is required. Performance

In that way, it is required to identify damages and losses clearly for the purpose of compensation valuation in the disaster situation. According to the questionnaire survey and discussions with professional valuers, it was observed that some factors such as business losses, social cultural and environmental losses are not taken into account at present disaster valuation system in Sri Lanka. Damages can be identified as a total or partial destruction of physical assets existing in the affected area occurs during and immediately after a disaster measured in physical units expressed in terms of reconstruction or replacement costs according to prices prevailing just before the event.

Ex. Housing and household goods, hospitals and schools, installations, Agricultural land and irrigation system, roads and bridges, water supply systems, electrical systems etc.

Losses can be identified as the changes in economic flows arising from the disaster occur until full economic recovery and reconstructions are achieved expressed in current monetary values.

Ex. Production and income losses, Higher operating cost and lower revenues in electricity, water supply, transport, environment deprivation, mental illness of people and etc.

The objectives of the study are two folds as to identify some specific factors affecting the payable value for the assessment of compensation and to develop a comprehensive pathway to assess the compensation value in Sri Lanka.

Some research also based on disaster valuation prefers several factors affect to the valuation and they proposed to develop a model for disaster valuation as further research. In this research, It is expected to build a suitable model for disaster valuation through the identifying important factors affecting the value and identifying different systems and sources which can be collected the relevant information to estimate compensations with providing systematical guidance pathway.

Literature review

The term "disaster" has many different views and generally considered violent or unexpected occurrences, often accompanied by loss of life, material damages, and difficulties for the functioning of society and the economy (Dosi, 2001).

In the disaster valuation following physical factors have been considered by different authors such as structure, size, structural improvements, materials used, age, condition of structure, the nature of the building, accommodation, accessibility of the property, location of the property, nature of the construction, floor area of the building, type of the building, type of floor, (Owusu-Ansah, 2012; Stefano, 2013; Wasantha,Wickramaarachchi, & Weerakon, 2006). In addition, Economic factors such as Business losses and Production losses in disaster valuation were also considered (Dosi, 2001). Moreover, (Owusu-Ansah, 2012; Stefano, 2013) discuss

neighborhood qualities, accessibility, mental illness, loss of life and loss of job as social factors that should be considered in disaster valuation. As discussed by (Guynhanh, 2015; Hanemann, 2003; Radoslaw, 2012; Stefano, 2013), the environmental factors which should be considered in disaster valuation are clean air, forest cover, surface water, land escape, Scenic beauty and soil fertility.

Replacement cost method

The past literature shows that replacement cost method is mostly used for disaster valuation and it is one of method of Market Based Approach. Methods of market-based approach is used market base indicators which good and services associated with competitive markets.

According to (Wyatt, 2013), this method is based on the economic theory of substitution that a potential buyer would pay no more for the subject property than the cost of acquiring an equivalent new one. The value is essentially a deprival value of the property to the owner. Because the subject property is already existing and sometimes, it can bethe cost of an equivalent new one, must be written down or depreciated to reflect differences between it and the subject property being valued. These differences might be a reflection of age (and estimated remaining economic life), comparative efficiency, functionality and running costs, and because these factors relate to the building rather than land, the replacement method involves the separate assessment of the value of the land and the depreciated replacement cost of the buildings.

According to (Wyatt, 2013), In the 1970s a depreciated replacement cost (DRC) version of the method evolved as a means of valuing specialized private and public-sector property assets corporate disclosure purposes (reporting the value of property assets in company accounts), but the method is also used to value existing uses of specialized properties for compulsory purchase and

compensation, and to estimate replacement cost for insurance valuations.

DRC is defined as the current cost of replacing an asset with a modern equivalent asset less deductions for physical deterioration and all relevant forms of obsolescence and optimization. The method does not calculate a market value. Because of an almost complete lack of comparable market transaction information, the method seeks to estimate replacement cost rather than exchange price. It does not produce a market valuation (Value in Exchange) as such because cost related to production rather than exchange and it is often regarded as the method of last resort for this reason. The method involves assessing the value of the land in its existing using and adding the replacement cost of the building, adjusted for depreciation and obsolescence. Mathematically the method started as follows (Premathilaka, 2016;Wyatt, 2013).

Value of Land
= XXXX
(+) Current cost of existing improvement
Replacement Cost of improvement
XXXX
(-) Depreciation allowances due to age and/ or Obsolescence
(XXX) XXXX
Value of the property
= **XXXXX**

Sector by Sector Approach

According to Guidance note on Post Disaster Damage and Loss Assessment of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC, 2003),(Stefano Balbi, 2013) the damage and loss assessment methodology is based on a sector-by-sector and a subsequent "bottom up" approach to estimating the overall effects of the disaster and their impact on the affected society

and economy. A brief description of a generic, step-by-step procedure for the assessment of damage and losses is included herein.

According to (ECLAC, 2003) The typical steps to be followed during an assessment of damage and losses such as Define a pre-disaster baseline, develop a post-disaster situation, estimate damage and losses, estimate overall amount of disaster effects, estimate macroeconomic impact and estimate impact on personal/household employment and income. This guidance note is provided a better way for the Post Disaster Damage and Loss Assessment (PDDLA) through the proper arrangement.

Define a pre-disaster baseline

This refers to the baseline of prevailing conditions before the disaster occurs, to be used as the basis for the estimation of damage and losses. Two sets of the pre-disaster baseline are required (ECLAC, 2003):

- A baseline on physical assets
- A baseline on the performance of production and sales

The baseline of physical assets refers to the existing physical facilities before the occurrence of the disaster within the affected areas, and should include type of housing units, the number and type of educational and health facilities, the extent of irrigated agricultural areas, the number and capacity of electricity, water supply and sanitation systems, the length and types of roads, etc. In the case of some sectors, this baseline should also include the available facilities of nearby areas that may be used on a temporary basis to provide compensation in the affected area.

The second baseline refers to the manner in which all economic activities performed in the affected area under non-disaster

conditions, referred to the volume and value of production, sales of goods and services, etc. The calendar of agricultural production activities, the value of production and sales in other sectors, the volume and value of essential (electricity, water and sanitation, and transport) services, for the current and subsequent two years, are examples of the information required.

Develop a post-disaster situation

The second step to be undertaken in the damage and loss assessment is to develop a post-disaster scenario, based on the findings of both a field survey where the assessment specialists obtain a full grasp of disaster effects on each affected sector and interaction with local sector specialists (from the government and the private sectors) that can provide inputs for the assessment.

According to above two steps which is provided in Post disaster guidance note of (UN-ECLAC), there should be developed a data base which related to the Pre-disaster situation and post disaster situation to estimate the fair compensation. Using pre-disaster information, valuation officers can compare the post disaster condition of the property and calculate the amount should be paid to the claimant or affected party.

Estimation of damage & losses

According to disaster valuation Guidance note of (ECLAC, 2003), The estimation of damage and losses for each and every sector is to be made through a comparison of the pre-disaster and post-disaster conditions, described under the two previous steps. Damage figures are to be presented in terms of the replacement value prevailing at the time of the disaster, and losses should be estimated in current values.

This guidance note has been said that to determine the overall amount of disaster effects, damage and losses for all affected sectors

must be added, giving due attention to avoid possible gaps and double accounting in the assessments. This requires that special care be exercised to ensure that the existing linkages between sectors are duly considered in the estimation of losses.

According to above descriptions, Guidance note on disaster valuation of (UN-ECLAC) provide methodology for estimate overall amount of disaster affect, estimate macro-economic impacts and estimate impact on personal/household employment and income. Therefore, it's very important to identify suitable methodology for estimate damages and losses in a post disaster situation.

Sources of Information

According to the Handbook for Estimating the Socioeconomic and Environment Effect of Disasters (ECLAC, 2003), There are several sources for gathering information.

Strategic sources

Regardless of whether the emergency and rehabilitation organizations are centralized or decentralized, the assessment specialist must locate a network of national organizations, national and international agencies, research centers and key people capable of providing the necessary data and authority to request and obtain additional documents and reports on the disaster. Despite the urgency of the situation, assessment specialists must only use documented facts, their own observations or those that can be derived from credible oral reports or summaries of the situation. In almost every case, without the support of such strategic sources, the assessment specialist will have no way of judging the validity and reliability of the information or of harmonizing different opinions or contradictions.

Maps

Maps are an essential aid to the assessment specialist and must be obtained from the outset of the assessment mission. If they exist, post-disaster maps detailing the catastrophe's effects are particularly useful, but they are usually difficult to obtain as they are constantly being updated. It may be difficult to track down even basic maps from central institutions.

The press

From day one, the press publishes news of the disaster that the assessment specialist may find useful. Newspaper clippings should be classified into easily manageable categories. The file must be kept up-to-date since it is of capital importance in four aspects of the assessment process: i) to locate names of potential strategic sources and useful documents; ii) to provide an independent opinion confirming the consistency and coherence of available official and unofficial information; iii) to draw attention to geographical areas and types of damage that may not have been covered by previous analyses; and iv) to provide data and figures that might complement the background information obtained from other sources.

Reconnaissance missions

Such missions may be carried out by land, air or water. If, as is commonly the case, the assessment specialist can only conduct one reconnaissance mission, it should be undertaken after an initial desk assessment of information sources has been completed. This will help ensure that additional information not available from previously consulted sources can be collected during the field mission. Finally, such a mission is a unique opportunity to directly observe major damage that might not be included in any documented source.

Surveys

Undertaking the detailed surveys needed for the rehabilitation and reconstruction stages, is only possible toward the end of the emergency phase, long after initial damage assessments are made. Three types of surveys can be very useful: i) studies carried out by offices and agencies that perform "rapid appraisals" surveys such as on-site inspection of the number and extent to which houses were damaged or destroyed, or local assessments of the number of victims and the morbidity structure; ii) broader studies that offer comparisons against pre-disaster conditions such as employment and unemployment surveys in the main cities (these tools are very useful in several stages of the damage assessment process and are analyzed below as an integral part of the secondary analysis of data) and iii) the rapid appraisal surveys the assessment specialist(s) can conduct, especially during reconnaissance missions (these should be viewed as a last resort whenever no better sources of information are available).

Secondary data analysis

Publications, documents, and reports containing background information prepared by secondary sources (institutions or persons other than the assessment specialists) can be fundamental sources of information. Regardless of the damage assessment methodology adopted, it will require a comparison of the post-disaster situation with a pre-disaster one. Secondary sources are the assessment specialist's best alternative when it comes to ascertaining pertinent values and the situation prior to the disaster. Moreover, pre-disaster background information will provide the starting point for an assessment of the disaster's effects. Without it, an objective damage assessment is impossible.

Interpersonal communication

Assessment specialists often have friends or colleagues who are living within or near disaster areas. Contact with these reliable

sources –by telephone, the Internet, radio or telegraph– is very useful for obtaining background information. Given that one of the first activities is to re-establish communications, it is highly likely that one of these systems will be working. Once contact is made, assessment specialists should make sure they clearly request specific information, which must then be verified by carefully comparing it against any independent sources that might be available.

Remote sensing data

Images obtained by means of remote sensors, especially those taken by satellites, can be extremely useful in damage assessment. However, their application faces certain important limitations. First, there are obvious advantages to using satellite images for assessing the impact of phenomena such as floods, hurricanes, mudslides, earthquakes and volcanic eruptions, forest fires and oil spills. However, these images usually lack the resolution needed to identify physical damage to infrastructure. As we have previously noted, satellite-imaging techniques are a powerful tool in pre-disaster stages, especially in planning, early warning, and vulnerability analysis. They can also be of obvious use during the reconstruction stage when large amounts of satellite data can be rigorously classified and analyzed.

Methodology

Both primary and secondary data were used in this study. Primary data were collected using a structured questionnaire from two simple random samples, comprised of 45respondents from the residents of the affected area, covering all types of characteristics of the properties and15 valuation officers of Government Valuation Department. In addition to the questionnaire, the observations carried out to verify the details of physical aspects. Maps and reports from census data, satellite imaginaries were used as secondary data. The gathered data were tabulated to excel database and analyzed using Statistical Package for the Social Science (SPSS). A

comprehensive model based on replacement cost method was formulated to calculate the fair and reasonabe quantum of compensation.

Model Analysis

The past literature shows that replacement cost method is mostly used for disaster valuation and some factors are added to the replacement cost value in order to find the payable value for compensation. The replacement method in literal sense is as follows (Premathilaka, 2016;Wyatt, 2013).

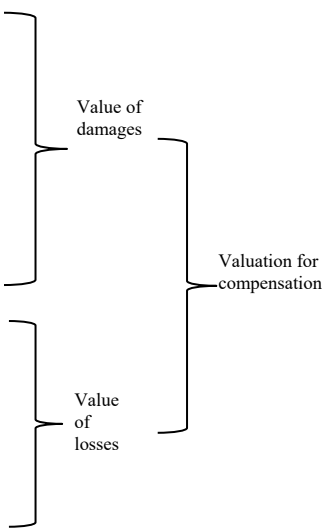
Value of Land	
	= XXXX
(+) Current cost of existing improvement	
Replacement Cost of improvement	XXXX
(-) Depreciation allowances due to age and/ or obsolescence	(XXX)
	= XXXX
Value of the property	
	= **XXXXX**

The basic model for this calculation is as follows.

V = Va – Vb +Vg+ Vl + Ve + Vs

Where,
V = estimated amount to be paid as compensation.
Va= the value of properties with their initial condition.
Vb = the value of discounted effect of the disaster (%).
Vg = the value of damaged goods
Vl = the Value of economic losses

Ve = the value for the environmental quality reduction
Vs = the value for the social well-being



The above model for the calculation of compensation is predominantly based on a combination of cost approach and comparison method. Building value was calculated on the basis of the replacement cost of the building. In addition to that, payable value for the compensation was calculated by adjusting the percentage of the damages occurred by the disaster and adding values of damaged goods and additional payments for economic losses and social and environmental impacts. The values were adjusted in accordance with the collected information. Rate per Square foot value is taken as per the rates adapted by the Government Valuation Department, Sri Lanka. The social and environment loss should be calculated by using willing to pay and willing to accept method with well-structured questionnaire.

Results and discussions

Table 1- Satisfaction on compensation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Highly satisfied	3	6.7	6.7	6.7
	Strongly satisfied	3	6.7	6.7	13.3
	Moderate	8	17.8	17.8	31.1
	Strongly not satisfied	18	40.0	40.0	71.1
	Highly not satisfied	13	28.9	28.9	100.0
	Total	45	100.0	100.0	

Source: Author, 2107

According to the Table 1, the majority of the respondent strongly not satisfied with the compensated value and it is 40% of the total respondent of the sample. At the same time highly not satisfied respondents are taken 28.89% from the sample. 17.78% of the people are moderately satisfied. The significant of this paper and necessity of a proper valuation model are clearly proved the above analysis.

The factors considered are extent of the land, accessibility of the property, location of the property, distance from the city center, legal interest, condition of the building, floor area of the building, accommodation, age of the building, construction materials, type of the floor, type of wall, type of ceiling, type of roof, design of the building, type of the building, renovations, conveniences, loss of goods, type of residence, monthly income, displaced period etc.

The value of land should be added to the compensation value in disaster valuation. It is the value which loss of land. Values for loss of land add to the compensation value only there is a considerable impact to the usage of the property as non-reusable. But in the Salawa explosion no any loss of land can be observed.

As this is disaster valuation the effective floor area is the total floor area of the building and no deductions made for building lines, street line etc. Moreover, deductions are not made for the age of the building as people could have recovered to their previous position and compensation calculated on replacement cost value.

The most difficult task is to calculate value of damaged goods due to inaccuracy of identification of the components as these evidences can be extracted only from householders. In this study also, value of damaged goods was collected from requested values by householders. However, the most accurate method for assessing the value of damaged goods is the method of item by item calculation. Total value of physical damages was calculated by merging the values loss of land, damaged building and loss of goods.

As a new indicator, the value of loss of income was based on the average monthly income of the affected families to generalize everyone in a disaster loss. In this regard, the following values for monthly income were calculated using the collected. Median (Rs. 60,000/=), Mode (Rs. 30,000/=), Mean (Rs. 59,200/=), Minimum

(Rs. 15,000/=) and Maximum (Rs. 150,000/=). Above indicators show that there is a big difference of income distribution in this area. According to the sample analysis, average monthly income of each family should be separately identified and added to the compensation value as loss of income.

In that way, following example describes the application of this model for the disaster valuation process for the compensation purposes. A property near to the Salawa army camp is used to this calculation and that property fully affected from the explosion.

Example 01:

Before Disaster

At the free disaster situation this property comprised with a 19-perch land and permanently fully completed single storied building used for the residential purpose. It's completed with asbestos sheet roofing and exposed rafter ceiling, partly brick work and partly cement block walls plastered and colour washed, Floor is cement rendered, timber framed glazed windows and timber doors. This building had a total floor area of 3000 square feet. Building has been fair condition and constructed 15 years ago. According to the recent land sales in this proximity vary from Rs. 100,000/= to Rs. 350,000/= and according to the adapted rate per square feet of valuation department for this type of building is Rs. 2,500. After the disaster value of the damaged goods are estimated at 2,000,000/=. Average monthly income is Rs. 70,000/= and it is assumed that value for the social and environment losses is assumed as Rs. 50,000/=.

Valuation for the Compensation (Replacement cost method)

Step 01 – Value of Land	
Total extent of land	00 A 00 R 19.00 P
Less – For reservations	00 A 00 R 00 P
Extent to be valued	00 A 00 R 19.00 P
Rate per perch	(Rs.)200,000
Value of land	**(Rs.)3,800,000**

Note: There is no land loss in Salawa armory explosion, in this context compensation is not paid for the land. Therefore, this calculation is only for the model building purpose. Considering all the factors regarding this property rate per perch adapted as Rs. 200,000.

Step 02 – Value of Building

Total floor area	3000 Sq. ft.
Rate adapted	(Rs.) 2500 per Sq. Ft.
Estimated value/Replacement value	**(Rs.) 7,500,000**

Note: This building is fully destroyed. Therefore, total value of the building is allowed for the compensation.

Step 03 – Value of goods

Value of damaged goods	(Rs.) 2,000,000

Step 04 – Value of Physical damages

Value for the loss of land	(Rs.) 0
Value for damaged building 100%	(Rs.) 7,500,000
Value for the loss of goods	(Rs.) 2,000,000
Total value of physical damages	**(Rs.) 9,500,000**

Step 05 – Value of losses

Loss of income for 5 months @ Rs. 70,000 per month	350,000
Value for the social and environment effect	(Rs.) 50,000
Total value of the losses	**(Rs.) 400,000**

Note: Income losses are calculated on the average monthly income of households and pay for the displaced period. The value for social and environment losses should be calculated based on willing to accept and willing to pay method and it is better to take consultations

from social & environmental specialist on the decision for social and environment impact also

Step 06 – Total value for the compensation

Total value of physical damages	(Rs.) 9,500,000
Total value of losses	(Rs.) 400,000
Total value of compensation	**(Rs.) 9,900,000**

Values adding to the formula,

V = Va – Vb + Vg + Vi + Ve + Vs

V = {(3800,000+7,500,000) – 3,800,000} + 2,000,000 + 350,000+50,000

V = 9,900,000

Note: Total value is comprised with values of total damages and total losses. If there is a lease holder or tenant, loss of land value & value for damaged building can be claimed by owner of the property and lease holder or tenant has right to value for damaged goods, loss of income, social and environment value. But it is differed from situation to situation and nature of tenant and lease agreements.

According to the collected data by respondents, the total compensation is given by the government as follows.

For the building (Rs.)	5,800,000
For the goods (Rs.)	800,000
Other (Rs.) (50000*5)	250,000
Total Compensation (Rs.)	**6,850,000**

In this total compensation given by the government consist of government valuation department valuation for the physical assets and value for the expenditure of displaced period decided by the central government. But it is better to be decided by the government valuation department.

Present development

This property has been comprised with 19 perch land and a permanently fully completed single storied building. It's completed with Asbestos sheet roofing and exposed rafter ceiling, partly brick work and partly cement block walls plastered and colour washed, tiled flooring, timber frame glazed windows and timber doors. This building had a total floor area of 3200 Sq. Ft. and newly constructed. The land value of this locality is not reduced because of the disaster and it is taken as Rs. 200,000. Considering new materials used in new construction, and according to the adapted rate per square feet of valuation department for this type of building is Rs.3000/=.

Replacement cost method

Step 01 – Value of Land

Total extent of land	00 A 00 R 19.00 P
Less – For reservations/ Street line	00 A 00 R 00 P
Extent to be valued	00 A 00 R 19.00 P
Rate per perch (Rs.)	200,000
Value of land (Rs.)	**3,800,000**

Step 02 – Value of Building

Total floor area in Sq. Ft.	3200
Rate per Sq. Ft. (Rs.)	3,000
Estimated value/Replacement value (Rs.)	**9,600,000**

Step 03 - Value of the property

Value of land (Rs.)	3,800,000
Value of building (Rs.)	9,600,000
Value of property (Rs.)	**13,400,000**

According to the calculation of this property, before disaster value of the property is Rs. 9,425,000/= (7,500,000*45/60 + 3,800,000), after disaster recovery measures and the development of the property it is increased to Rs. 13,400,000/=. According to the before valuation of the building and after the value of the building, it is increased by Rs. 3,975,000/=. Householders of this property has developed the building with better conditions than it was before the disaster happened by using both their own savings and compensations.

Example 02: Before Disaster

This property comprised with a single storied building used for the residential purpose. It's completed with Asbestos sheet roofing and no ceiling, cement block walls rough finished, Floor is partly cement rendered and partly tiled, timber framed glazed windows and timber doors. This building had a total floor area of 800 square feet and constructed 15 years ago. The value of goods is Rs. 400,000 as to the respondent. According to locality and land sales in this proximity rate per perch taken as Rs. 200,000/= and according to the adapted rate per square feet of valuation department for this type of building is Rs. 2,000/=. The damages to the building are about 25%.

Valuation for the Compensation

Replacement cost method

Step 01 – Value of Land

Total extent of land	00 A 00 R 16.00 P
Less – For reservations/ Street line	00 A 00 R 00 P
Extent to be valued	00 A 00 R 16.00 P
Rate per perch	(Rs.) 200,000
Value of land	**(Rs.) 3,200,000**

Step 02 – Value of Building

Total floor area in Sq. Ft.	800
Rate per Sq. Ft.	(Rs.) 2000

Estimated value/Replacement value **(Rs.) 1,600,000**

Step 03 – Value of goods

Value of damaged goods (Rs.) 400,000

Step 04 – Value of Physical damages

Value for the loss of land (Rs.) 0
Value for damaged building 25% (Rs.) 400, 000
Value for the loss of goods (Rs.) 400, 000
Total value of physical damages **(Rs.) 800,000**

Step 05 – Value of losses

Loss of income for 2 months @ Rs. 60,000 per month 120,000
Value for the social and environment effect (Rs.) 50,000
Total value of the losses **(Rs.) 170,000**

Step 06 – Total value for the compensation

Total value of physical damages (Rs.) 800,000
Total value of losses (Rs.) 170,000
Total value of compensation **(Rs.) 970,000**

According to the data collected by the respondent, total compensation is given by the government as follows.

For the building (Rs.)	260,500
For the goods (Rs.)	373,000
Other (Rs.) (50000*2)	100,000
Total Compensation (Rs.)	**733,500**

Present development

After the disaster, they have not done any construction or repair to the building. They have rejected the compensations given by the government and said that compensation amount was not enough for

their damages and no wealth of them to repair or rebuilding. However, they have not recovered yet.

According to these two examples, the main factors for the make difference between study model valuation and government valuation are goods value and value of losses. Example 01 shows that people who affected from the disaster have built back better their buildings by using compensation and their own wealth. But some of the people still have not recovered at the time of observation. It can be seen in example 02. Therefore, success of the purpose of compensation can be achieved only with the understanding level of the people. Because they look at the value of compensation amount which decided by the government, compare with only compensations for other properties. At the same time, it is identified that the replacement value of the semi damages is difficult to calculate.

Problem and Recommendations in Professional point of view

There are several problems which can be identified from the government valuer's experience in salawa disaster valuation for the compensation. 66.66% of respondents have been experienced disaster valuation and problems and recommendations are only taken from them. In that way, they suggest several solutions to solve those problems for better and easy practice of disaster valuation. Those problems and recommendations are summarized as follows.

Table01 - Summary of problems and recommendations of professionals in disaster valuation

No	Problems	Recommendations
1	Lack of information	Rating card should be properly maintained and Property coding system is needed

2	There is no proper time frame for the assessment process	Arrangement of proper time frame is needed
3	There is no any perfect legal document.	-
4	Communication problems between affected parties and valuers	Proper communication system is required
5	Inadequate assistance of other responsible institutions	Proper coordination between all responsible institutions is required. (ex: Divisional secretariats)
6	Lack of professional interventions	Need other professionals support in addition to valuers (ex: Structural engineers)

Source: Compiled by Author, 2017

Pathway Analysis

According to all gathered experiences and knowledge within this period of researching and discussions with professionals, disaster valuation can be done properly in following steps.

1. Activation
2. Preparation & Planning
3. Data collection, verification & validation
4. Consolidation & analysis
5. Formulating valuations
6. Appeal
7. Final valuation

Step 01 - Activation

Activation of the process is start with the government request.

Step 02 – Preparation & Planning

In this step, plan the all necessary arrangement to support the disaster valuation process. Before made planning strategies, primary

inspection about the affected area should be done. Required team composition, human resources, information, components etc. decided in this step. Under this step, compilation of relevant secondary data, analysis of existing information should be done before the field survey and the responsible divisional institutions and other institution's support should be taken. Appoint teams for identified areas should be done in this step. At the same time common guidelines for the assessment should be provided for each and every team. In that way, a workshop should be organized to inform guidelines before the primary data collection, because all the valuers who engage with the disaster valuation process should similarly inspect similar properties.

Step 03 – Data collection, verification & validation

After gaining proper understand about the affected area primary data collection done by using various data collection methods (questionnaires, interviews, observation surveys, focus groups) secondary data and information collection also should be done in this step.

Step 04 – Consolidation & analysis

Data gathered from the various sources analyze, process, and consolidation are done in this step.

Step 05 - Formulating Valuations

After a proper analysis of all required data and information, compute the payable value for compensation. In this step formulate the draft valuations for each property separately.

Step 05 - Appeal

After informing the formulated valuation for the damages and losses to the affected parties can appealed on that valuation with specific factors which affect to the value of compensation. In that way, Valuers analyze their request weather it is considerable and fair.

Step 06 – Final valuation

Considering appeal and raft valuation, final valuation done by adjust for the considerable factors only. This process cannot properly apply without good time frame. Therefore, A sample of the formulated time frame based on the above steps is given below. This can be used for any disaster valuation process after making the necessary alterations according to the scale of the disaster.

Table 02- Sample time frame of disaster valuation for compensation

Activities	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week
1.Emergency State								
2.Analysis on damages & Losses								
Preparation & planning								
Baseline data collection								
Field survey for primary data collection								
Verifications & valuation								
Consolidation & analysis								
3.Computation of valuation								
Prepared draft of Valuation								
Appeal on valuation								
Write final valuation report								

Source: compiled by Author, 2017

Conclusion

Numerous factors such as physical factors, economic factors, social and environmental factors and legal factors affecting the disaster valuation process for the payment of compensation were identified in this study. However, it was observed that some factors such as business losses, social cultural and environmental losses are not taken into account at present disaster valuation system in Sri Lanka. Moreover, in the meantime it can be seen that those factors are recommended for disaster valuations in some of the research and those are carried out based on different countries around the world. With referencing to those adopted valuation measures, considering values of those omitted factors, problems and recommendations of Valuer's, a comprehensive model was formulated and a guidance pathway for the process of disaster valuation is also developed. On other hand, lack of information is identified as another significant issue leading to complexities in the process of compensation valuation for disasters. It can be used to collect data in this kind of situation by using remote sensing data like satellite imaginary (ex. Google earth) and aerial photo graphics etc.

Recommendations

It is observed that not only values of physical damages but also values of economic, social and environmental impacts should be considered in disaster valuation. At the same time, a baseline information system should be formulated to be used as a secondary source or an information database and immediate actions should be taken to build the system. Moreover, it can be recommended that a policy should be developed by considering all factors as physical factors, economic factors, social and environmental factors and legal factors identified in this study for the disaster valuation.

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