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A glimpse of the unseen: An assessment of the core shelters in Tuguegarao City, Cagayan, Philippines

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Abstract

Tuguegarao City, a lone city in Cagayan province, is situated in a low-lying area and is frequently flooded during rainy seasons and typhoons. The three core shelters erected in the city are home to 250 indigent families who were beneficiaries of the housing program through the Department of Social Welfare and Development (DSWD). This research delved into profiling the core shelters in the barangays of Cataggaman Pardo, Annafunan East, and Namabbalan as to their general characteristics and environmental conditions. The findings reveal that while the core shelters are generally livable, there are areas of concern that need to be immediately addressed to improve the living experiences of its residents and can be a basis in planning for the possible construction of core shelters in the near future. The areas of concern are poor drainage system, inaccessibility to the main roads, transportation and health establishments, unpaved roads, overcrowding, and poor structural conditions of the housing units. It is recommended that a rapid assessment of the houses in the core shelters be conducted by the local government units spearheaded by the core shelter officials. An evaluation of the health and wellness condition of its dwellers must likewise commence.

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Introduction

Tuguegarao City, the capital of Cagayan province from among 29 municipalities, is situated in a low-lying area and has been experiencing flooding up to five times a year. The worst floods were brought by typhoons- Lawin, Ompong, and Ulysses, which happened in 2016, 2018, and 2020. Considering that the city is in a valley, heavy rains, even just in episodes of low pressure, cause erosion in the Caraballo, Sierra Madre, and Cordillera mountains, making it a catch basin. As many houses are underwater up to the ceiling level, the city government has considered solutions to the perennial problem. One of which is relocation.

Among the rehabilitation projects of the government through the Department of Social Welfare and Development (DSWD) the National Housing Authority (NHA), is directed toward the immediate provision of shelter to disaster-affected indigent families whose houses were damaged by a typhoon or other natural disasters and to those families whose lots were reclaimed by the government because of the construction of roads, bridges, schools or any public-owned infrastructures. These are called the core shelters, which can eventually become permanent residences, especially if the beneficiaries themselves were mandated to provide manpower or financially contribute to the construction of the core shelters.

Three thousand eighty-three core shelter units have been erected in Region 2 since 2010, thus making it the second top implementer of the Core Shelter Assistance Program (CSAP). The province of Cagayan has 1,019 units situated in different towns (PIA, 2011), and there are ongoing plans to erect more core shelters in other municipalities of Solana, Amulung, and the coastal areas. There are three core shelters in Tuguegarao City: Annafunan East, 100 housing units; Cataggaman Pardo has 56 units, and Namabbalan has 51 units. It was the city government that provided the lot where houses of relocated families were put up. Engineering and supervision of the construction and the re-graveling of roads leading to the core shelter site were also initiatives of the Local Chief Executive.

While the core shelters should provide decent homes for low-income families whose houses were adversely affected by typhoons and those who were displaced because of road and infrastructure development projects of the Local Government, it is observed that the housing units, apart from being sub-standard with limited floor space would even cater to extended families. To lessen the burden of overcrowding, the local government waived the rights for the residents to improve their housing units.

This research assesses the profile of the core shelters in Tuguegarao City, Cagayan Valley, highlighting its housing units' profiles. The government can utilize the results of this research as a basis for improving core shelters, site- selection, and establishing policies for any plan to construct core shelters in the future.

Materials and methods

Study Design

This study employed a descriptive survey research design in assessing the profile of the three core shelters situated in Tuguegarao City, Cagayan, in terms of its general characteristics, environmental condition, and profile of its housing units.

Data Gathering Tools

A quantitative method for data collection and data analysis was used in the study. A survey checklist and an interview guide, both of which underwent validity and pilot testing, were used as the primary data gathering tool. In addition, however, triangulation was done through visual observation, records review, and interviews with some residents of the core shelters to further the analyses. Data to obtain the general characteristics of core shelter in general and core shelter housing units were derived using a survey checklist and Key Informant Interview. The respondents for this part are the core shelter residents. The data to elucidate the environmental profile of the core shelter residents utilized an Interview Guide. The interviewed respondents included the City DSWD Staff, Barangay Council Officials, Barangay Health Worker in charge of the respective Core Shelter; Neighborhood Association

for Shelter Assistance Officer assigned to manage the core shelter programs the midwife in-charge of the barangay. Further, the content validity of the questionnaires was determined through the agreement system, where the evaluators were academic collaborators. The final instruments were reviewed and approved by the Research Ethics Review Committee of Cagayan Valley Medical Center (RERC- CVMC).

Setting

The study sites were the three core shelters located in Barangay Annafunan East, Cataggaman Pardo, and Namabbalan of Tuguegarao City in Cagayan. After the site validation, key informant interviews and documents review was conducted at the barangay hall where the core shelter is situated. Finally, the finalization of the research was carried out at Cagayan State University, Andrews Campus.

Study population

Two hundred one (201) core shelter residents were visited in their homes and were derived from the profile of their core shelter units and their health and social conditions. In addition, another 17 key informants were invited (two Barangay Officials which specifically included the Barangay Captain, the Barangay Councilor in charge of Health and Development, and the Barangay Councilor in charge of Disaster Risk Reduction and Management; a Barangay Health Worker, a Member of the Neighborhood Association for Shelter Assistance Office, a City Health Staff, the Midwife in-charge of the barangay assigned of keeping the records of health problems in the core shelter) to be involved in an in-depth interview for the profiling of the individual core shelter and give us a clearer picture of why health and social turmoil occur. Additional informants were the two DSWD staff from the City Social Welfare and Development Unit.

As for the residents of the core shelter, the family should have been residing in the core shelter for at least a year and have experienced flooding or any other type of disaster while living in the core shelter. In addition, only the head of the family must be interviewed on behalf of his family. For the Key Informants Interview, the respondents were selected based on their role in the core shelters. It included the DSWD staff assigned in the core shelter program of the government regardless of the tenure of service; the barangay officials who had been managing the core shelters during the time of the study; the barangay health worker assigned in each of the core shelters; a Neighborhood Association for Shelter Assistance (NASA) official of each core shelter regardless of position; and the Midwife who is assigned to the keep the records of health problems of the core shelters and who reports the same to the City Health Office. Those who declined or were unable to provide informed consent were excluded from the study.

Data Collection

The study first obtained ethics approval from the Research Ethics Review Committee of a large tertiary hospital in the province [Location Masked for Blind Review]. Ethical principles were applied to the whole research process. Before data collection, an inception activity was also done to seek permission from the respective barangay captains and core shelter officials. Data were gathered from the participants after presenting the informed consent form and eliciting their voluntary participation by affixing their signatures in the said form. The families in the core shelters were personally visited, and the head of the family was identified to respond on behalf of the household members. In the undertaking involving Key Informant Interviews, the respondents were personally visited in their respective workplaces.

Data analysis

All the responses were collated using a frequency distribution table and were presented to the respondents before writing the final manuscript. The research results were communicated to the concerned agencies of the government.

Results and discussion

The general characteristics and environmental conditions of the core shelters present information on

the living situations of the residents. In addition, they may explain the occurrence of circumstances that may occur in the area. As seen in Table 1, Namabbalan has the largest land area, followed by Annafunan East and then Cataggaman Pardo. According to the PIA (2012), the City Government of Tuguegarao identified and provided the land where families were relocated based on the guidelines set forth by the DSWD under CSAP.

These agencies likewise chose the recipients of the housing units based on criteria given by the City Urban Planning Department. However, in Namabbalan, the lot where the core shelters were erected was owned by the residents themselves, although the construction of core shelters was supported by the Department of Social Welfare and Development Region 2- why the housing units in Namabbalan are widely dispersed.

Table 1. Profile of each core shelter in terms of its general characteristic.

Characteristic		Annafunan East	Cataggaman Pardo	Namabbalan
Land Area		Approximately 25,000 sq.m	Approximately 20,000 sq.m	Approximately 51,000 sq.m
Number of housing units		100	56	51
Description	Duplex	48	0	0
	Single-detached	4	56	51
Population Size		511	306	257
Sex distribution	Male	267	160	109
	Female	244	146	105
Sex Ratio		1:1	1:1	1:1
Class of Barangay		Urban Category 4	Rural Category 3	Rural Category 6
Topography		Approximately 17.6462, 121.7284, on the island of Luzon. Elevation at these coordinates is estimated at 19.8 meters or 65.0 feet above mean sea level.	Approximately 17.6077, 121.6990, on the island of Luzon. Elevation at these coordinates is estimated at 22.9 meters or 75.1 feet above mean sea level.	Namabbalan Norte is situated at approximately 17.5525, 121.8070, on the island of Luzon. Elevation at these coordinates is estimated at 114.9 meters or 377.0 feet above mean sea level. Nambbalan Sur is situated at approximately 17.5345, 121.8154, on the island of Luzon. Elevation at these coordinates is estimated at 103.2 meters or 338.6 feet above mean sea level.
Proximity to the Main Road/ National Hi-way		1.15 km	3.04 km	0.02 km

The Department of Social Welfare and Development (DSWD) Region 2 has released funding for the core shelters of typhoon-affected families in the three barangays of Tuguegarao City as early as 2010 credited under the Core Shelter Assistance Project and was part of the UNDP technical assistance program. The objective of the project was to assist in the rehabilitation of disaster victims, reduce the number of families who are rendered homeless by providing structurally strong core shelters, promote self-reliance among beneficiaries and the community, and maximize the participation, engagement, and commitment of the beneficiaries and the neighborhood in the construction of structurally strong houses through the “bayanihan” system. The most number of core shelter housing units is found in Annafunan East, having 100 units of which 48 are duplex type, 4 are single-detached units, and another

two units are duplex types with the second floor. As per the report, thirteen (13) families left core shelter and had their units for lease because they could hardly withstand the inconvenience during flooding episodes. As to population size, the core shelter situated in Annafunan East has the most number of residents with a corresponding population density of 20 residents per square kilometer, presenting that it is very crowded. This can be due to the non-existence of regulation regarding how many family members can live in a core shelter unit and its location in an urban barangay.

Also, the results show that the Annafunan East core shelter has the lowest elevation amongst shelters which makes it vulnerable to flooding. Attempts to improve the road condition going to the core shelter units and the erection of residential homes by private citizens have added more reasons why the community is flooded. The table further shows that core shelter Namabbalan is near the hi-way, which is attributed to the reason why there are lots of cases of vehicular accidents and complaints of noise pollution. On the contrary, the core shelter in Cataggaman Pardo is far from the road, which makes it too difficult for the residents to travel to the city. Aside from that, they complain about fare rates. The case of Annafunan East is different. While they may be near the road, there are no tricycles or public utility vehicles that get to the core shelters, so residents complain of walking about 15- 25 minutes to reach the core shelter from the hi-way.

Table 2. Profile of each core shelter in terms of its environmental condition.

Parameters		Annafunan East	Cataggaman Pardo	Namabbalan
Flooding	Frequency	Frequent	Rare	Rare
	Duration	Two weeks – 1 month	1 to 2 days	1 to days
	Depth	10 ft	Less than 1 ft	Less than 1 ft
Drainage		No drainage at all	With drainage but are not interconnected and with no outlet	With interconnected drainage except for houses far from the high-way
Stagnant water		Present in roads and near houses	Present in drainage pits with no outlets	Present in confined to areas near the rice fields
Waste Disposal of the core shelters	Schedule for Waste collection	Once a week	Once a week	Once a week
	Mode of garbage collection	Segregation is done at the source and then transferred by the residents at a designated pickup point ready for collection by the municipal dump truck.	Segregation is done at the source and then transferred by the residents at a designated pickup point ready for collection by the municipal dump truck.	Segregation is done at the source and then transferred by the residents at a designated pickup point ready for collection by the municipal dump truck.
Proximity to the nearest market		1.56 km	2.18 km	10.76 km

A Barangay Health Station is situated in each barangay where the core shelters are found, and the facility promptly addresses the immediate primary health needs of the residents. Flooding is a significant concern for the Annafunan East core shelter (Capili, Chua, Regala, & Mallabo, 2020). Aside from the area's low elevation (Table 2), which is lower than the road level, the core shelter has no drainage. The shelter looks like a pond, even in small rains. Worst, it takes weeks to months for the water to subside. Wooden boats were already made by some residents, which they needed to traverse the flood. Although flooding is not prevalent in Cataggaman Pardo and Namabbalan core shelters, there are many occurrences of stagnant water due to the poor condition of their drainage system. Given prior knowledge that drainage systems are not connected, the residents still continuously dump garbage and sewage in open drainage parts. This has allowed the propagation of vectors. The foul and irritating smell of garbage becomes the source of quarrels among the settlers. During rainy seasons, the dumped trash clogs

the drainage and expedites flooding. As revealed in Table 2, all core shelters in Tuguegarao City follow proper waste disposal, wherein segregation is done at the households. The garbage collectors transacted by the LGU collect them once a week in a designated dumping and collection area. However, not all residents practice segregating their garbage and would instead burn them within the neighborhood. According to Kumar (2004), waste management is brought about by improper collection of waste even when it had been promptly segregated at the primary source and leads to pollution, health hazards, and groundwater contamination.

The findings of the study also reveal that the core shelters have proximal access to food stores. The proximity of food stores is associated with dietary intake and obesity (Krukowski, Sparks, & MC Sweeney 2013). However, nutrition education, including learning to understand food and menu labels, could help residents of low-income communities to make healthier choices.

These innovations could help reduce neighborhood inequalities, enhance environmental justice, and promote lifelong healthy eating habits, optimum health, and vibrant communities (Hilmers, Hilmers, & Dave 2012). The majority of the households in the core shelters conformed to the standard set by the DSWD as seen in Table 3.

The importance of family size was highlighted in the study of Rivera and See (2011), where it specified that the acceptable number of children for a typical Filipino household is four (4) based on the statistics from the National Statistics Office (NSO). However, the findings of this research revealed that several households exceeded the average family size.

As with the Key Informant Interviews conducted, the increase in family size was due to having extended family or close family ties. Although house improvements were made to accommodate additional family members, overcrowding remains an issue. As to the housing structure in each core shelter, the house floor area and the materials used to build the houses are similar. As seen in Table 4, each unit measures 5 x 4 sqm, which falls within the acceptable range of area allocation set by the National Building Code of the Philippines (Gilles 2012).

Table 3. Household Size of the core shelters.

Family size	Standard set by DSWD	Annafunan East (n=96)	Cataggaman Pardo (n=55)	Namabbalan (n=49)
1-3	normal family size is 4-5 persons per unit	18	12	16
4-6		57	27	29
7-9		15	12	4
More than 9		6	4	0
Total		96	55	49

The housing type in the three core shelters varies. Most of the housing units in Cataggaman and Namabbalan are single-detached, while most of the houses in Annafunan are duplex to accommodate two families in one house. Furthermore, the number of rooms in each housing unit varies, although most adhere to an average of two rooms per unit. This situation brings about the poor quality of ventilation and increases the risk of disease transmission (WHO 2010). The study of Solari and Mare (2012) emphasized that adequate space in the house can lead to a lack of privacy which brings about stress, complex social interactions, and behavioral problems of household members. In the core shelter of Namabbalan, it was found out that three toilet facilities are communal. About 3-6 families share a common toilet. It was also noted that all the core shelters do not have a relatively important ceiling to protect their electrical plumbing systems and contribute to the hot temperature inside the core shelter, especially during the summer months.

Further, the data reveal that the core shelter housing units have a Level 3 water infrastructure, a piped water supply, and a private water point. As to sanitation infrastructure, most housing units have a toilet and a sink for sanitation and hygienic purposes. All of the housing units in the three core shelters have access to sanitation toilets, electricity, and water source, specifically from pipes and water stations. However, only 186 of the 200 (92.5%) houses profiled in the core shelters have flush toilets.

Table 4. Description of the housing structure in the core shelters units.

Structure	Standard set by DSWD	Annafunan East	Cataggaman Pard	Namabbalan
Floor Area	5 x 4 sqm	5x4	5x4	5x4
Material	Semi-concrete	Semi-concrete	Semi-concrete	Semi-concrete
Type	Single-detached	4	56	51
	Duplex	48	0	0
Number of Rooms	2	46	32	27
Number of Windows	5	2-4	2-4	2-4
Number of doors	2	47	3	25
Toilet Facility	Private	96	55	49
Ceiling Height	8 ft.	No ceiling	No ceiling	No ceiling
Water Infrastructure (Level 3)	None	96	55	49
Sanitation Infrastructure	Toilet	96	55	49
	Sink	78	55	45
Proportion of access to electricity	None	96	55	49

The residents confirmed through the interviews that electricity is vital for their daily living and interactions; hence, they have prioritized connecting to a power supply. However, even with little rain, they expect to lose current because the main switch found at the barangay hall is shut- down. This finding confirms reports from the NDHS (2017) emphasizing that ninety-three percent of Filipino households have access to electricity and that the majority of families use an improved source of drinking water (bottled water/refilling station and water piped into their homes). In addition, three in four households have an improved toilet facility, and most households have a flush or pour-flush toilet to a septic tank. On the other hand, one-quarter of households use unimproved sanitation, 17% use a shared facility of an otherwise acceptable type, 3% use an unimproved facility, and 5% have no facility.

Conclusion

Each of the core shelters has a varied profile in terms of its general characteristic and environmental condition. However, they were created for the same purposes and by a similar government bureau. Generally, the three core shelters in Tugugegarao City adhere to the Department of Social Welfare and Development standards in terms of floor size but have concerns about poor design, lack of ceiling, accessibility, drainage, and flooding. While some residents who can afford renovations made improvements to their core shelter units, most owners have no means for it.

The resiliency of the housing units must be assured, considering that typhoons at these times are stronger; otherwise, it will leave the core shelter residents homeless. Should not the core shelters' social, environmental, and physical issues be solved, it will cause more serious public health concerns.

References

Capili JT, Chua JT, Regala JM, Mallabo LC. 2020. 'Assessment of Common Health and Social Problems of the Residents in the Core Shelters of Tuguegarao City, Cagayan, Philippines' IAMURE International Journal of Ecology and Conservation **31(1).** http://ejournals.ph/ form/cite.php?id=15304

Gilles S. 2012. 'Humanizing socialized resettlement housing programs: A challenge towards sustainability practices in urban and rural communities 14th SGRA Seminar on Urban-Rural Gap and Sustainability Shared Growth' Sekiguchi Global Research Association.

Hilmers A, Hilmers DC, Dave J. 2012. 'Neighborhood disparities in access to healthy foods and their effects on environmental justice' American Journal of Public Health **102(9),** 1644-1654.

Krukowski RA, Sparks C, DiCarlo M, mcSweeney J, West DS. 2013. 'There's more to food store choice than proximity: a questionnaire development study' BMC public health **13,** 586. DOI: 10.1186/1471-2458-13-586.

Kumar S, Mukherjee S, Chakrabarti T, Devotta S. 2007. 'Hazardous waste management system in India: an overview' Critical reviews in environmental science and technology **38(1),** 43-71.

Solari CD, Mare RD. 2012. 'Housing crowding effects on children's wellbeing' Social science research **41(2),** 464-476.

World Health Organization. 2010. 'Developing guidance for health protection in the built environment mitigation and adaptation responses' Meeting report. International Workshop on Housing, Health, and Climate Change.

World Health Organization. 2017. 'Regional action agenda on achieving the sustainable development goals in the Western Pacific.