



Profile of the flood-affected families caused by Typhoon Ulysses and the Widespread flooding in Cagayan province

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Abstract

The study was conducted to establish baseline information about the socio-demographic and socio-economic status, effects, and damages of Typhoon Ulysses and the widespread flooding of 3,000 flood-affected families in the 10 municipalities and 1 city of Cagayan province. The study was done on a face-to-face interview with the aid of a structured questionnaire that served as the main tool for data collection. Collected data were analyzed using descriptive statistics. It shows that respondents are dominated by males with a mean age of 48, Ilocanos and Roman Catholic. Most of the respondents are married, belong to a 4-6 member nuclear family, and attained secondary education. The respondents are tenants in the land they are cultivating and not members of any organizations. Furthermore, the major source of their income is crop production. The identified Agriculture, Aquatic, and Natural Resources (AANR) related livelihood and rehabilitation need the most are free-range chicken production and bamboo production. They obtained information about the Ulysses flooding from the Municipal/Barangay announcement where they experienced a 3.1–6 meters depth of flood and assessed it as a severe effect of the typhoon that results in trauma. Sufficient relief goods were received during and after the flooding. Moreover, the damages of Typhoon Ulysses to crop production has an estimated amount of Php9,824,551.00, Php7,476,900.00 on houses and other properties, and Php2,444,100.00 on vehicles and machinery. Therefore, additional funding should be allocated for projects that focus on quick response, recovery, and rehabilitation of damage, particularly in AANR-related interventions.

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Introduction

On November 11, 2020, a powerful Category 4 Typhoon Vamco, also known as Typhoon Ulysses, lashed the main island of Luzon. The typhoon brought continuous heavy rains and caused massive flooding in Cagayan Valley which was one of the severely affected regions (OCHA, 2020) the local authorities reported the widespread flooding as the worst in 45 years. Aside from the damage to houses brought by the typhoon, there was also a displacement of people to evacuation centers or in makeshift shelters in roadside camps. Additionally, damages to agriculture, shelter, and infrastructure were also reported due to the flood up to five meters deep. Electrical power and communication services were severely disrupted. The province of Cagayan and Isabela in Northern Luzon experienced the most damage (IFRC, 2022)

On the situation report from the Cagayan Valley Regional Disaster Risk Reduction and Management Council, as of November 25, 2020, there are 117,160 families or 421,704 individuals who are affected in 487 barangays of 25 municipalities of Cagayan province. Meanwhile, the reported casualties include 13 dead and 13 missing in the province alone due to landslides, electrocution, and drowning.

In addition, an estimated of ₱2.5 billion worth of damage to roads, bridges, flood control structures, public buildings, and other infrastructures the Department of Public Works and Highways (DPWH) Region 02 (as cited by CVRDRRMC, 2020).

On the other hand, the Department of Agriculture (DA-RFO2) reported that Cagayan province had estimated damage to the crops of P503,113,600.00 as of November 16, 2020. Flooding destroyed a total area of 12,647.71 hectares intended for agriculture, where 7,035.10 hectares of this area were severely and totally destroyed.

Hence, this study established baseline information about the socio-demographic and socio-economic status of the flood-affected families in Cagayan

province. Furthermore, information, effects, and damages during the onslaught of Typhoon Ulysses and the widespread flooding were determined which can provide information and possible interventions that will improve future extension projects.

Materials and methods

Study area

This study was conducted in 10 municipalities and 1 city of Cagayan province namely: Alcala, Baggao, Buguey, Camalanuigan, Enrile, Gattaran, Lasam, Piat, Sanchez Mira, Sto. Niño, and Tuguegarao City wherein the most severely affected families reside.

Respondents and sampling procedures

Communities and family respondents were identified with the help of the MSWD officers, Municipal Agriculture Office, and MDRRMO in coordination with Barangay Captains.

Research instrument

The survey was done on a face-to-face interview with the aid of a structured questionnaire that served as the main tool for data collection.

Statistical analysis

Collected data were analyzed using descriptive statistics. Means, frequencies, percentage distributions, and standard deviation were used to establish baseline information about the socio-demographic and socio-economic status, effects, and damages during the onslaught of Typhoon Ulysses and the widespread flooding.

Results and Discussion

Socio-demographic status of the respondents

Table 1 shows that the age of 3,000 respondents in Cagayan province are in their middle age, with an average of 48 and a standard deviation of 14.5.

Out of the total respondents, 697 or 23.2% have ages between 41-50 years old, followed by 599 or 20% of respondents aged 51-60 years old, 598 or 19.9% of respondents aged 31-40 years old, followed by 462 or 15.4% of respondents have age 61-70 years old, while

416 or 13.9% of respondents are within the age bracket of 21-30, followed by 205 or 6.8% of the respondents belong to the age bracket of 71-80, and only 23 or 0.8% of respondents belong to 17-20 years

old. Regarding the respondents' sex, the majority (2,149 or 71.6 %) of the 3,000 total respondents are males, while the remaining 851 or 28.4 %t are females.

Table 1. Socio-demographic status of the respondents.

Socio demographic characteristics	Frequency (n=3,000)	Percentage	Mean	Standard deviation
Age				
17-20	23	0.8		
21-30	416	13.9		
31-40	598	19.9		
41-50	697	23.2	48	14.5
51-60	599	20.0		
61-70	462	15.4		
71-80	205	6.8		
Sex				
Female	2,149	71.6		
Male	851	28.4		
Religion				
Roman Catholic	2,551	85.0		
Born Again	257	8.6		
Iglesia Ni Cristo	90	3.0		
Seventh-Day Adventist	43	1.4		
Methodist	35	1.2		
Jehovah's Witnesses	7	.2		
Aglipayano	6	.2		
Latter-Day Saints	6	.2		
Dating Daan	2	.1		
Protestant	2	.1		
Baptist	1	.0		
Ethnicity				
Ilocano	2,139	71.3		
Itawes	675	22.5		
Ibanag	120	4.0		
Tagalog	26	0.9		
Isnag	25	0.8		
Agta	10	0.3		
Igorot	5	0.2		
Civil Status				
Married	2,364	78.8		
Widow/Widower	360	12.0		
Single	210	7.0		
Separated	66	2.2		
Type of Family				
Nuclear	2,494	83.1		
Extended	506	16.9		
Family Size				
4-6	1,818	60.6		
1-3	1,057	35.2	4.05	1.3
7-10	125	4.2		
Highest Educational Attainment				
High School Graduate	1,536	51.2		
Elementary Graduate	561	18.7		
Elementary Level	285	9.5		
High School Level	247	8.2		
College Level	221	7.4		
College Graduate	136	4.5		
Vocational Graduate	14	0.5		
Membership in Organization				
No	2,370	67.7		
Yes	630	32.3		

Table 1 also shows the religious affiliation of the respondents, where most (2,551 or 85%) of the respondents are Roman Catholic. Other religious affiliations of respondents are Aglipayano, Baptist,

Born Again, Dating Daan, Iglesia Ni Cristo, Jehovah's Witnesseth, Latter-Day Saints, Methodist, Protestant, and Seventh Day Adventist.

Table 2. Socio-economic status of the respondents.

Socio Demographic Characteristics	Frequency	Percentage
Tenurial Status		
Tenant	2,032	67.7
Owner and Tenant	483	16.1
Owner	431	14.4
Share Tenant	30	1.0
Leaseholder	24	0.8
Home Ownership Status		
Owned	2,586	86.2
Staying with parents/relatives	264	8.8
Occupying for free	132	4.4
Rented	18	.6
Home Condition		
Combination of concrete and light materials	1,657	55.2
Combination of concrete and wood	452	15.1
Combination of wood and light materials	441	14.7
Concrete	219	7.3
Light materials	182	6.1
Wood	49	1.6
Kitchen		
Attached to rooms/house	1,885	62.8
Separate	1,115	37.2
Fuel Used		
Wood	1,745	58.2
Combination of gas and wood	802	26.7
Combination of electric and gas	29	1.0
Gas	424	14.1
Lighting Source		
Electricity	2,480	82.7
Electricity and Gas	475	15.8
Solar Power	33	1.1
Battery	12	0.4
Bathroom		
Outside the house	1,971	65.7
Within the house	1,029	34.3
Toilet Type		
Water Sealed	2,897	96.6
Pit Type	103	3.4
Type of Drainage System		
Open Canal	2,600	86.7
Close drainage system	400	13.3
Source of Water Supply		
Manual Pump Well	2,600	86.7
Open Well	378	12.6
Piped Municipal/ Barangay water supply	12	0.4
Electric pump	10	0.3
Water Sufficiency		
Sufficient	2,493	83.1
Insufficient	507	16.9
Water Quality		
Potable	2,600	86.7
Unsafe	400	13.3
AANR economic activities (Multiple Response)		
Crop Production	2,420	80.7
Animal Production	704	23.5
Farm Labor	280	9.3
Identified AANR related livelihood and rehabilitation needs (Multiple Response)		
Free-Range Chicken production	3,000	100.0
Bamboo production	3,000	100.0
Mongo production	2,420	80.7
Rice-Fish-Duck-Gabi production	1,854	61.8
Peanut production	1,550	51.7
Cacao production	1,250	41.7
Mushroom production	1,213	40.4
Coffee production	1,050	35.0
Onion production	815	27.2
Fish Grow-Out	135	4.5

As to their ethnicity, the majority (2,139 or 71.3%) of the total respondents are Ilocano, 675 or 22.5% are

Itawes, while 120 or 4% are Ibanag. Other ethnicities of the respondents are Tagalog, Isnag, Agta, and

Igorot. The same table presents the civil status of the respondents, where most (2,364 or 78.8%) of the respondents are married. Out of the 3,000 respondents, 360 or 12% are Widow/Widower, 210 or 7% are single, while 66 or 2.2% are separated. Most (2,494 or 83.1%) of the respondents maintain a nuclear type of family, while the remaining 506 or 16.9% are extended families. Also, table 1 shows the family size of the 3,000 respondents with an average of 4.05 and a standard deviation of 1.33. Out of the total respondents, 1,818 or 60.6% have a family size of 4-6, 1,057 or 35.2% have a family size of 1-3, and

only 125 or 4.2% have 7-10 family members. Moreover, the highest educational attainment of the majority (1,536 or 51.2%) of the respondents is high school graduates. While 561 or 18.7% are elementary graduates, 285 or 9.5% attained elementary level, 247 or 8.2% earned high school level, 221 or 7.4% attained college level, 136 or 4.5% are college graduates, and only (14 or 0.5%) are vocational graduates. As to their membership in an organization, the majority (2,370 or 67.7%) of the total respondents claimed to have not been members of any organization, while the other 630 or 32.3% are members.

Table 1. Information, effects, and damages of typhoon Ulysses flooding.

Information, effects, and damages of typhoon ulysses flooding	Frequency	Percent
Source of Typhoon Information (Multiple Response)		
Municipal/Barangay announcement	1,998	66.6
Radio	1,231	41.03
Television	1,079	35.96
Social Media	490	16.3
Text Messages	306	10.2
Depth of Flood (meter)		
3.1-6	1,734	57.8
1-3	747	24.9
6.1-9	470	15.7
9.1 and above	49	1.6
Mean		4.69
SD		2.04
Assessment on the effect of Typhoon Ulysses		
Severe	2,232	74.4
Manageable	768	25.6

They are living in their own house which is a combination of concrete and light materials, kitchens are attached to their rooms/houses, and bathrooms are located outside their houses with water-sealed toilets and an open canal drainage system. Most of the respondents use electricity for lighting, manual pump well as the source of sufficient potable water supply, and wood for cooking.

Socio-economic status of the respondents

Table 2 shows the tenurial status of the respondents. The data shows that the majority (2,032 or 67.7%) of

the respondents are tenants, 483 or 16.1% are both owners and tenants, 431 or 14.4% are owners, 30 or 1% are share tenants, and only 24 or 0.8% are leaseholders.

The respondents' homeownership status, as presented in Table 2, depicts that most (2,586 or 86.2%) of the respondents owned the house they occupied. While 264 or 8.8% are staying with their parents/relatives, 132 or 4.4% are occupying for free and 18 or 0.6% of the respondents rent the house they occupy. Regarding the home conditions of the

respondents, the majority (1,657 or 55.2%) of the respondents have their houses made of a combination of concrete and light materials. While the others are made of a combination of concrete and wood (452 or 15.1%), a combination of wood and light materials (441 or 14.7%), concrete (219 or 7.3%), light materials (182 or 6.1%) like nipa, cogon, and bamboo. At the same time, 49 or 1.6% have their house made of wood. Additionally, the data also show that 1,885 or 62.8% of the respondents have a kitchen attached to their rooms/houses, while the other 1,115 or 37.2% have a separate kitchen. As to the fuel used in the

respondents' households, the majority (1,745 or 58.2%) of the respondents used wood for cooking. While more than one-fourth of them (802 or 26.7%) are using a combination of gas and wood, using gas by 424 or 14.1%, and a combination of electric and gas by 29 or 1%. The lighting source of most (2,480 or 82.7%) of the respondents confirmed having electricity serviced by the Cagayan Electric Cooperative. While (475 or 15.8%) revealed to have been using a combination of electricity and gas, using solar power by 33 or 1.1%, and only 12 or 0.4% are using battery-operated lighting.

Table 2. Damages of Typhoon Ulysses in animal, crop, and fish production.

Types of production	Frequency	Area cultivated (ha) /No. of Stocks	Area damaged (ha)/ No. of Dead Animals	Total amount damaged (Php)
Animal Production	704	21,471	14,928	5,975,000.00
Crop Production	2,420	2,170.35	1,824.65	9,824,551.00
Fish Production	125	19.2	19.2	1,804,155.00

The location of the bathroom, type of toilet, and type of drainage system of the respondents are also shown in Table 2. The majority (1,971 or 65.7%) of the respondents declared that their toilets are outside their houses while the others are within the house (1,029 or 34.3%). As to the type of toilet they are using, almost all (96.6% or 2,897) of the respondents are using a water-sealed type toilet, while only 103 or 3.4% are using a pit type toilet. When it comes to the type of drainage system, most (2,600 or 86.7%) of them have an open canal, and only 400 or 13.3% of the respondents have a close drainage system. Moreover, most (2,600 or 86.7%) of the respondents are using manual pumps well as their source of water supply. While the other respondents are using open wells (378 or 12.6%), piped municipal/barangay water supply is enjoyed by 12 or 0.4% and electric pumps by 10 or 0.3% as their source of water supply.

Also, as shown in Table 2, most (2,493 or 83.1%) of the respondents claimed that their water supply was sufficient. While a few disclosed that their supply of water was insufficient (507 or 16.9%). Regarding the quality of water that respondents are using in their households, there are 2,600 out of 3,000

respondents, or 86.7%, claimed to have a potable water supply, while 400 respondents, or 13.3% of them, stated that they are using unsafe quality of water. Furthermore, Table 2 indicates other economic activities of the flood-affected respondents. Most (2,420 or 80.7%) of the respondents are engaged in crop production, followed by 704 or 23.5% who are engaged in animal production, and 280 or 9.3% are farm laborers. While 55 or 1.8% are in fishpond operation, the least number was accounted for 54 or 1.1% are engaged in fishing. Aside from that, when the respondents were asked about their preferred livelihood and rehabilitation needs on the damages caused by flooding brought about by the typhoon Ulysses, all (3,000 or 100%) of them said to have an interest in free-range chicken production and bamboo production. While there are 2,420 or 80.7%, who are interested in mongo production considering its short period of economic return. Majority (1,854 or 61.8%) mentioned rice-fish-duck-gabi production and 1,550 or 51.7% showed interest in peanut production. Other identified AANR related livelihood activities include mushroom production (1,213 or 40.4%), coffee production (1,050 or 35%), onion production (815 or 27.2%), and fish-grow-out (135 or 4.5%).

Table 5. The estimated amount of damage to houses and other properties.

Item	Amount of damages (Php)
House	3,048,500.00
Appliances	2,060,100.00
Utensils	1,361,900.00
Furniture	899,400.00
Clothing	107,000.00
Total	7,476,900.00
Vehicles and Machinery	Amount of Damages (Php)
Car	1,180,300.00
Motorcycle	595,400.00
Tricycle	227,400.00
Tractor	221,000.00
Combine Harvester	80,000.00
Thresher	76,000.00
Bicycle	64,000.00
Total	2,444,100.00

Information, effects, and damages of typhoon Ulysses flooding

Table 3 shows the respondents' source of typhoon information, assessment of the effect of typhoon Ulysses, and the depth of flood experienced by the affected family respondents. A majority (1,998 or 66.6%) disclosed to have obtained information about the Ulysses flooding from the Municipal/Barangay announcement. There are 1,231 or 41.03% who revealed to have acquired information from radio, and 1,079 or 35.96% sourced their information from television. About 490 or 16.3% got information from social media, and 306 or 10.2% received information from text messages. Also, the table below denotes that

flood depth experienced by the respondents was from 1 meter to above 9 meters with a mean depth of 4.69 and a standard deviation of 2.04. Out of the 3,000 respondents, 1,734 or 57.8% experienced the flood depth ranging from 3.1 to 6 meters, 747 or 24.9% experienced 1-3 meters flood depth, 470 or 15.7% experienced 6.1-9.0 meters, while 49 or 1.6% experienced 9.1 meters and above. Moreover, the majority (2,232 or 74.4%) of the respondents assessed the typhoon Ulysses as "SEVERE" while the other 768 or 25.6%, assessed the typhoon as "MANAGEABLE" as they are already used to experiencing yearly flooding and that they have developed their resiliency to such kind of calamity.

Table 3. Health-related effect of typhoon Ulysses to the respondents.

Health-Related Effect	Frequency	Percent
Trauma	2,180	72.7
Illness	240	8.0
Trauma and Illness	580	19.3
Sufficiency of relief goods	Frequency	Percent
Yes	2550	85
No	450	15

Table 4 indicates the extent of damages caused by typhoon Ulysses in animal, crop, and fish production. For animal production, 704 respondents declared to possess a total of 21,471 heads of animals, including poultry and livestock. From this, deaths of 14,928 heads of animals amounting to Php 5,975,000.00

were recorded. For the crop production, 2,420 respondents declared to have been cultivating a total area of 2,170.35 hectares with a total area damaged of 1,824.65 hectares with total losses amounting to Php 9,824,551.00. Moreover, 125 fishpond operators declared a total of 19.2 hectares in their fish

production where all of which were damaged with an assessed value amounting to Php1,804,155.00.

Multiple response

Moreover, the damages to houses and other properties of respondents caused by typhoon Ulysses are presented in table 5. The total amount damaged to the houses of respondents reached a total of Php3,048,545.00. Also, reported damages on appliances are equivalent to Php2,060,100.00, while damages and losses of utensils carried away by the strong flood water current are equivalent to Php1,361,900.00. Damages to furniture reached a value of Php899,400.00 and damages to clothing amounted to Php 107,000.00. The total estimated damages to houses, appliances, utensils, furniture, and clothing amount to Php7,476,900.00. As to the vehicles and machinery, the largest amount of damage was on cars amounting to Php1,180,300.00, followed by motorcycles amounting to Php595,400.00, tricycles amounting to Php227,400.00, tractors with a monetary value of damage amounting to Php221,000.00, combine harvester amounting to Php80,000.00, thresher amounting to Php76,000.00, and bicycle amounting to Php64,000.00, with a total estimated amount of damages on vehicles and machinery of Php2,444,100.00. Table 6 shows the health-related effects brought by flooding caused by Typhoon Ulysses and the sufficiency of relief goods the respondents received. A total of 2,180 or 72.7%, claimed that they were traumatized during the onslaught of the typhoon, while 240 or 8.0% suffered from illness. Meanwhile, 580, or 19.3%, experienced both trauma and illness. As to the sufficiency of relief goods, most (2,550 or 85%) of the respondents received sufficient relief goods during and after the flooding, while 450 or 15.0% claimed otherwise.

Conclusion

The finding of the study shows that typhoon Ulysses and the widespread flooding with 3.1-6 meters depth

in Cagayan province resulted in trauma and severe damages of Php9,824,551.00 to crop production, Php7,476,900.00 to houses and other properties, and Php2,444,100.00 to vehicles and machinery of the respondents. In line with this, the identified AANR-related livelihood and rehabilitation needs the most are free-range chicken production and bamboo production. Therefore, additional funding should be allocated for projects that focus on quick response, recovery, and rehabilitation of damage, particularly in AANR-related interventions.

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