Impact of Flood on Children Nutrition

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ABSTRACT

Purpose: *Particularly with regard to floods, landslides, drought, forest fires, and hot and cold waves of viral infections every year, Nepal is a very disaster-prone nation due to the high summer precipitation rates. More landslides occur in Nepal's river hills and Terai region throughout the summer (June to September) due to the heavy monsoonal rain that falls during this time. In the up-stem region of rivers, flooding is more likely to occur, and the down-stem region of rivers has a dipping issue. Sedimentation harms homes, agriculture, and human life all at once. The research aims to distinguish nutritional difference among under-five children with and without flood through Weight, Height and Mid-Upper Arm Circumference (MUAC) reading.* **Design/Methodology/Approach:** *The study was carried out in a Nepali region that had just experienced severe flooding. The nutritional status of children in flood-affected and non-flood-affected communities was assessed and compared as ex-post facto research. Used mixed methodologies (qualitative and quantitative) to analyse how floods affect in ECD children. Review of relevant literature on the consequences of a natural disaster (flood) on children who were affected by it. Establish the target population, take ethical issues into account, and ask the mother of the children to provide her informed consent. Face-to-face interviews were used to collect information from respondents. The children's height, weight, and mid-upper arm circumference were measured. The information was then analysed using SPSS and Ena (WHO software).*
Findings/Result: *The floods affected children, who measured anthropometry and body mass and prepared results. Review of literature related to flood-affected children and the effects of natural floods (disasters). Define the target population, consider ethical considerations, and obtain informed consent from the children's mother. The data shows flood-affected children are more malnourished than children in non-flood-affected in the sane social areas. In the Karnali River, unthinkable floods stop human life. During the flooding duration, almost all houses leave their homes for 1 to 4 weeks and stay as refuse in community buildings (community homes, schools, and Godam buildings). According to the Karnali River floods, this condition occurs 1–3 times per year. After every flooding, it takes huge cost for the maintenance of their home, toilet, and handpump to get back to their normal life.*
Originality/Value: *This is the first empirical research in Nepal to compare and analyse the impact of flood on Children's nutrition status to draw the attention of policy maker and different societies working in the area.*
Paper Type: *Review paper*
Keywords: Flood, Height, Weight, Mid upper arms circumference, malnutrition, Stunting.

1. INTRODUCTION :

Nepal is known for flood impact also in monsoon (IFRC, 2023, p. 5) [1]. Preparation against flood is most during monsoon (WECS, 2011, p. 2) [2]. Bardiya, Rajapur is located in western far western region of Nepal, is also flood prone. Using anthropometric measurements, child growth indicators are reported. The WHO Child Growth Standards reference population and the distribution of height and weight among children under the age of five were compared (WHO 2006) [3]. A population that receives enough nutrition will have a distribution that resembles that of the reference population, whereas the N

274. Distribution of a malnourished population's nutrition among children and adults won't. The ratios of height to height, weight to age, and weight to height can all be expressed as standard deviations (z scores) from the reference population's median. Malnutrition is defined as values that are more than two standard deviations below the median of the WHO Child Growth Standards.

Stunting, also known as low height-for-age, is a sign that growth is slowing. Stunting is a sign of a child's exposure to a poor growth environment and reflects the general health of a community. Stunting has a variety of complex and unidentified reasons, many of which are related to poor nutrition, recurring infections, chronic diseases, and other factors of WHO. Acute undernutrition is measured by wasting, or low weight-for-height. It symbolizes the absence of proper nutrition throughout the time leading up to the study. Wasting might be the result of insufficient dietary intake or a recent bout of illness or infection that caused weight loss.

A composite index of weight-for-height and height-for-age is called underweight, or low weight-for-age. It portrays kids that are wasted, stunted, or both.

Overall, 25% of kids under the age of five have stunted growth, with 6% having severe stunting; 8% have wasted growth; 1% have severely wasted growth; and 19% have underweight growth, with 4% having severe underweight growth. One percent of kids are obese (Ministry of Health and Population and USAID, 2022, pp. 273, 274 & 275) [4].

A "cut-off point" of 11.5 cm was established by World Vision in his guidebook to identify youngsters who are seriously undernourished. Any youngster who measures less than 11.5 cm (red) on the MUAC scale is deemed to be very malnourished, is in danger of dying, and needs emergency medical care. Modestly malnourished children are those with MUACs between 11.5 cm and 12.4 cm (yellow). A youngster is considered to have a normal mid-upper arm circumference if their MUAC measures 12.5 cm or more (green) (World Vision, 2011, p. 65) [5].

Report from the Nepal Demographic and Health Survey in 2022 One percent of children under the age of five are overweight (too heavy for their height), 8% are wasted (short for their height), 19% are underweight (also short for their age), and 25% are stunted (short for their age) (Ministry of Health and Population and USAID, 2022, p. 273 & 274) [4].

Ghimre et al. highlighted the sever effect of floods on children, mothers' and elders in context of Nepal based on intensive review. June to September is the main monsoon month in Nepal. Floods damage houses, foods, agricultural crops, livestock, poultry, and cloth. Floods affect the Terai area of Nepal (Ghimire, 2023, p. 115) [1].

The population along the Karnali River's bank was particularly vulnerable to destruction, according to the Red Cross of Nepal's assessments of the flood in Bardiya Rajapur. According to UNDP, 2009, Nepal is rated as the second-highest country in South Asia for flood threat. Due to the country's steep and rugged mountain geography, delicate geology, active tectonics, harsh weather, unplanned urbanization, and infrastructure development, the nation is susceptible to recurring floods. Affected individuals are often those who reside in low-lying locations or along river basins, are poor, have a susceptible family member or members, or lack coping mechanisms (Nepal Red Cross, 2021, p. 6) [7].

Data on the educational attainment of the male and female populations aged 6 and older, respectively, were presented by NDHS. 16% of men and 35% of women do not have any formal education. Only 6% of women and 8% of men have finished lower basic education, 5% of women and 7% of men have finished upper basic education, 8% of women and 9% of men have finished secondary school, and 3% of women and 5% of men have finished more than secondary education (Ministry of Health and Population; USAID, 2022, p. 15) [1].

The Government of Nepal believes that the majority (28.7%) of the overall literate population has completed primary level (classes 1 to 5) education, as detailed in the census report for 2021. Similar to this, 19.9% of the entire literate population has completed the lower secondary level (classes 6 to 8), and the next highest level is S.L.C. (or equivalent), with 9.5 percent. Similarly, 19.5% have finished higher education levels (above S.L.C. or equivalent) (National Statistics Office, 2021, p. 3) [8].

According to the Nepal NDHS survey, more women (67% versus 27%) than men work in agriculture. Only 8% of women and 12% of men work in professional, technical, or management positions, whereas 11% of women and 17% of men are employed in sales and services (Ministry of Health and Population; USAID, 2022, p. 43) [1].

According to HPHC 2021, there will be 106285 houses built, with galvanized sheet accounting for 54939 of them, reinforced cement 24420, thatch/straw 4331, tile 22080, stone/slate 383 and wood planks 54, respectively (National Statistics Office, 2021, p. 29) [8].

The enhanced sanitation facilities in Nepal are all toilets that are hygienically separated from human contact, according to the NDHS survey. They include vented improved pit (VIP) latrines, pit latrines with slabs, and composting toilets. Flush/pour flush toilets flush water and waste to a piped sewer system, septic tank, pit latrine, or unknown destination. Ninety two percent of the population made use of upgraded sanitary facilities, of which 27% had one in their home and 67% have one in their yard or plot. Compared to urban regions, open defecation occurs more frequently in rural areas (9% vs. 6%) (Ministry of Health and Population; USAID, 2022, p. 426 & 428) [4].

According to the Census Reports 2021, 57.0 percent of all households get their drinking water mostly from taps or pipes, both inside and outside of their homes. Other primary sources of drinking water for families are wells or hand pumps (29.8%), containers of bottled water (4.6%), spouts (3.9%), exposed wells (2.1%), covered wells (1.5%), and rivers or streams (0.4%) (National Statistics Office, 2021, p. 2) [8].

The weight-for-height index, which evaluates body mass in relation to body height or length and reflects acute undernutrition, was described as wasting (weight-for-height) by the NDHS, Nepal. Children are deemed thin (wasted) if their weight-for-height z score is less than minus two standard deviations (–2 SD) from the reference population's median. Severely wasted children are those whose z scores are less than minus three standard deviations (-3 SD) from the median. 8% of young children under five are wasted, and 1% are seriously wasted (Ministry of Health and Population, USAID, 2022, pp. 274, 32) [4].

According to research by Lamsal, K.P. and colleagues using the MUAC and WHZ, respectively, the prevalence of wasting was 3.1% and 10.5%. With specificity of 99.7% and 91.2%, we discovered a 13.6% sensitivity for severe acute malnutrition (SAM) (MUAC 115 to 125mm). Children aged 6-23 months had a higher sensitivity of MUAC than children aged 24-59 months (Lamsal, et al., 2021, p. 881) [9].

Cogill focused age weight and height training guideline to community health workers and community members should measure the mid-upper arm circumference of infants and children who are 6 to 59 months old and check them for bilateral pitting oedema in order to identify children with severe acute malnutrition in the community as early as possible. infants and young children with a mid-upper arm circumference between the ages of 6 and 59 (WHO, 2013, p. 2) [10]. According to Brauce Cogill anthropometric indicators measurement guide the child's weight, and height values falling outside the following ranges according to age given below.

Table 1: Age and weight (kg)

Age (months)	**Range of weight (kg)**
36-41	9.5 – 22.15
42-47	10 – 23.00
48-53	11 – 24.5
54-59	11.5 – 26.00

Table 2: Age and height (cm)

Age (months)	**Range of height (cm)**
36-41	80 - 115
42-47	85 - 115
48-53	90 - 120
54-59	90 - 125

(Cogill, 2003 Revised Edition, p. 90)[11].

According to Caroline stunting, rather than wasting or being underweight, was shown to be the most prevalent form of undernutrition in food-affected areas. The review is equivocal on the most important forms during the short term and intermediate periods following foods due to weak and inadequate evidence, respectively, in light of undernutrition during the post-food interval. Stunting was identified

as the most significant form of malnutrition over the long-term period, while wasting and underweight showed mixed results (Caroline, Dambach, Methula, & Phalkey, 2022, p. 20) [12].

According to Lenters, Lindsey, and colleagues, acute malnutrition is frequently accompanied by pathogenic reasons and occurs from abrupt decreases in food intake or diet quality. Various terms with largely overlapping meanings have been used to describe and define acute malnutrition, including protein-energy malnutrition, wasting, kwashiorkor, and marasmus. (Lenters, Wazny, & Bhutta, 2016, p. 205) [13].

Ghimire, M, and Majarjan, R.K., discovered a very minor difference between the nutritional health of Chepang and non-Chepang youngsters. A total of 4.3% of kids were severely underweight or severely malnourished (-3SD of weight for height). Similar to this, 26.9% of children were classified as mildly malnourished (-1SD) and 8.7% as moderately malnourished (-2SD). The report strongly urges further research on the subject among other age groups and geographic areas (Ghimire & Majarjan, 2018, p. 6) [14].

Lamsal, K. P. et al. recommended MUAC cutoffs can be used as a quick screening technique to identify wasting in children aged 6-59 months, they only detect a small portion of all wasted children (Lamsal K., Parajuli, Pun, & Adhikari, 2021, p. 1) [15].

According to Jahan et al., of the total population, 45.8% (or 51.7%) were underweight (i.e., WAZ 2 SD), 109/170 (or 64.1%) were stunted (i.e., HAZ 2 SD), and 48/164 (or 29.3%) were thin (i.e., BAZ 2 SD). According to MUACZ (i.e., MUACZ 3SD), 14.3% (n = 4/28) of children aged 5 years had severe wasting, often known as severe acute malnutrition (SAM); however, this proportion was 7.7% (n = 2/26) when WHZ was employed as an indicator (i.e., WHZ 3SD). The z scores' mean (SD), median, and interquartile range (IQR) have been compiled (Jahan, et al., 2021, p. 4) [16].

According to a reported by USAID summarized in three districts (Kailali, Sindhupalchok, and Jaarkot), Growth Monitoring and Promotion (GMP) in three districts, Nepal has continuous and national priority under 5 years old child nutrition, and 32 percent of children there are stunted (height/length-for-age greater than two standard deviations below the median), 12 percent are wasted (weight-for-height (USAID, 2022, p. 2) [16].

Children were usually undernourished, according to Millar and friends' qt baseline report: 47% of them were stunted, 46% underweight, 17% wasted, and 24% had microcephaly (Miller, Neupane, Joshi, & Lohani, 2020, 7p. 9700) [17].

According to Mamann among school-aged children, the proportions of obesity, overweight, underweight, and stunting were 4%, 12%, 7%, and 17%, respectively. Compared to boys, girls were more likely to be overweight or obese (20% vs. 13%) (Hamann, et al., 2023) [18].

Miah focused overall, 63.5% of GAM cases and 65.4% of SAM cases in Bangladesh were found by WHZ alone; 15.1% of GAM cases and 19.3% of SAM cases were found by MUAC alone; and 21.4% of GAM cases and 15.3% of SAM cases were found by combining WHZ and MUAC (Miah, Alim, & Sarker, 2020, p. 83) [19].

As a result, the MoHP Nepal has incorporated community-based management of severe acute malnutrition (SAM) into the Multi-sector Nutrition Plan (MSNP) 2013-172, which was created in 2011 and approved by the cabinet, as well as into the National Health Sector Program II (NHSPII), which runs until 2017. Currently, scale-up plans for community-based SAM management are being created, and the MSNP now calls for the piloting of successful interventions to deal with MAM. As part of a holistic strategy, the CMAM review suggested that the approach strengthen connections between various sectors as well as with policies and programs for preventing malnutrition. A joint review of the mother and Child Health Care (MCHC) and the 2011 UNICEF CMAM pilot evaluation were conducted at the same time. (UNICEF, 2016, p. 2 & 3) [20].

The Nepal Planning Commission and WFP focus healthy, food-secure population depends on proper nutrition. Malnutrition can hinder a person's capacity to lead a healthy, fulfilling life by affecting their physical and cognitive development. In addition to feeding practices and the sufficiency of health and sanitation services, nutrition is also influenced by food security (including availability to and consumption of healthful foods). Increased nutrition awareness and support from the public and private sectors are responsible for the decline in childhood stunting. Iodized salt is presently consumed by 95% of Nepali youngsters. Similarly, 86% of children between the ages of 6 and 59 months are receiving vitamin A prophylaxis (Nepal Planning Commission and WFP, 2019, p. 23) [21].

According to Ghimire et al. “nutrition and floods," demonstrates Nepal's high susceptibility to natural disasters. Earthquakes, floods, landslides, heat and cold waves, and vector-borne diseases frequently

occur as a result of these catastrophes. The villages in the hills and plains are most susceptible to monsoonal floods and landslides each year Natural disaster floods occur in Nepal during the summer and move from its northern to southern regions. In the summer, it has a greater impact on Nepal's Terai region. The floods cause damage to homes, food, infrastructure, agricultural crops, cattle, forests, and biodiversity. They also destroy human (children, women, and men) materials (Ghimire, 2023, p. 119) [7].

Constitution of Nepal focused, there are 123 castes and ethnic groups. Their cultures also vary. All castes have their own traditional cultural activities and cultures, for example, the Newar of Kathmandu, the Bhote of the Himalaya, the Santhal of Jhapa, the Janakpur of Mithila, etc. This chapter presents a critical review of the nutritive values and possible nutraceutical and health benefits of those fermented food products to widen their use and application in a much broader sense (Khadka, 2022) [22].

Despite Bhutan's generally high levels of food sufficiency, food access and nutrition remain problems in the country, as highlighted by climate risk. With wasting rates of 4.3% for children under 5 and a significant prevalence of anaemia, 21.2% of children under 59 months were stunted (twice as many in rural regions as in urban ones). The number of people in Bhutan who are in danger of going hungry is expected to change as a result of climate change's effects on global food security (World Bank, 2021) [23].

According to Saisy Sharma, the goal of the current study was to assess the nutritional health of flood-affected residents living close to the banks of the Brahmaputra and Assam rivers in India and Assam. The majority of these citizens work in agriculture, which is crucial to the nation's output. Nutritional information was gathered through meticulously compiling medical and dietary histories, physical examination, and information correlation. An evaluation of a population's nutritional status is the most important modern method for figuring out the kind, severity, and degree of malnutrition (Baruah, 2019) [24].

Ghimire, M. focused Chepang community had more food crisis than the non-Chepang community, which can determine the nutrition status of Children in both communities. The study was conducted in rural area of Chitawan and Makawanpur districts of Nepal (Ghimire M. , 2018) [25]

2. STATEMENT OF PROBLEMS:

The adverse impact of flood on communities with widespread of destruction of homes, infrastructure and livelihood. Among the most vulnerable group affected by floods are young children particularly those in the early childhood development (ECD). ECD is a critical period for cognitive, physical and socio-economic development, and during this phase can have long-lasting consequences on a child's overall well-being and future potential.

The problem at hand is to understand and address the unique challenges faced by ECD children in flood-affected area, these are following:

Health and well-being: The problem is suffering from contaminated water resources, lack of proper sanitation facilities, and limited access to health care services which are factors impact the health and well-being of ECD children in the affected area.

Nutrition and food security: Flood loss crops, food security and disrupted supply chains, resulting in malnutrition inadequate diets for small children, its impacts show in children health.

Access to education and early learning opportunities: Flood affected damages their schools, road and furniture's. Its affect to the children in their education and socio-emotional development.

3. OBJECTIVES :

The research aims to distinguish nutritional difference among under-five children with and without flood through Weight, Height and Mid-Upper Arm Circumference (MUAC) reading.

4. METHODOLOGY :

Ghimire, M., Mishra, A. K. and Aithal, P.S. wrote This research adopted the process of scientific review as Meta synthesis to get a solution of annual flood effects on children's nutrition as pragmatic research philosophy. Flooding is an evidence-based empirical issue in Nepal. Every flood is different, but one consequence is a basic need, particularly food. In this review, the researcher attempts to recommend a pragmatic solution for the time being through the systematic literature. That is why the research may be considered pragmatic, philosophy-based research. The researcher uses deductive logic reasoning at large during the review; however, the observation experience of the researcher is arranged as inductive

logic reasoning during inference confined to adductive in a single sense for the completeness of the objective. In-depth archival analysis followed by an intensive review would be strategies adopted during the scientific review (Ghimire, 2023, p. 116) [7].

Used mixed method (qualitative and quantitative methods) understanding of impact of floods on ECD children. review of literature related to flood-affected children and effects of natural flood (disaster). Define target population and consider ethical considerations and obtain informed consent form the children's mother. Data gathered data through questionnaires from children's mothers. Data analysed through SPSS and Ena (WHO software).

The study was carried out in Nepal, Lumbini Province of Bardiya district, Rajapur Municipality. The study was comparative cross-sectional study design. The study objective was to identify nutritional status of food affected and non-flood affected area. A survey questionnaire was developed, both closed and open-ended question. The gathered from flood-affected and non-flood-affected households 3-5 years children's mothers or caregiver. The researcher's target was 3-5 years children of food victims and non-flood victim households. The data was collected through face-to-face interview with 3-5 years households. Data analysed through WHO standard and SPPs.

5. RESULT AND DISCUSSION:

The general descriptive data are presented from Rajapur Municipality.

5.1 Height and weight Report of Flood and Non-Flood affected research area:

Demographic information of respondents' flood-affected and non-flood affected households, including religion, mothers' education, and mothers' occupation, was discussed.

Table 3: Flood Affected Home Gender Crosstabulation

			Gender		Total
			Boy	Girl	
Flood affected home	Yes	Count	55	50	105
		%	52.4%	47.6%	100.0%
	No	Count	39	66	105
		%	37.1%	62.9%	100.0%
Total		Count	94	116	210
		%	44.8%	55.2%	100.0%

Table 3 shows that the total number of flood-affected and non-flood-affected households was 210, of which 105 were flood-affected. Gender-wise, flood-affected boys were 55 (52.4%), and 50 (47.6%) were girls. Non-flood affected households were 105; among them, 39 boys (37.1%) and 66 girls (62.9%) were.

The western region of Nepal, including Bake, Bardia, Kailali, and Kanchanpur districts, is home to residents of Tharus. So that almost all respondents more than 93% were Tharu. Their houses were made traditional and poor citizens home like Khariya (dried plants), wood, and galvanized sheet (Zasta sheet). The artistic traditional houses of the Tharu people are made of wood and thatch. When floods come and go, the flood houses become wet, and then they use their houses. All the houses' walls were broken because poor people were made from thatch, mud, and wood, and the roof of home was galvanized sheet. The flood time, those people who live in low-lying areas or along Karnali River base in poor people more vulnerable family members typically affected due to homes wall become quickly broken. After the flood, there is remained roof and skeleton of the house.

Table 4: Flood affected home Caste Crosstabulation

			Caste			Total
			BC	Janajati	Dalit	
Flood affected home	Yes	Count	6	98	1	105
		%	5.7%	93.3%	1.0%	100.0%
	No	Count	11	83	11	105
		%	10.5%	79.0%	10.5%	100.0%

Total	Count	17	181	12	210
	%	8.1%	86.2%	5.7%	100.0%

Table 4 shows that the total number of flood-affected and non-household households was 210, of which 105 were flood-affected. Caste-wise, flood affected Brahmin/Chhetry (BC) households were 6 (5.7%), Janajati 98 (93.3% Tharu), and Dalit only 1 (%). Total non-flood-affected households were 105, among them Brahmin/Chhatry 11 (10.5%), Janajati 83 (79% Tharu), and 11 No. (10.5%) were Dalits. Being very low, the social construction of the location dominates it. That is why, under both flood-affected and non-flood-affected categories, they are the leading ones. However, the economic status of Nepalese society is generally dominated by the upper caste. This location is not an acceptance that a better economy leads to prosperity through easy access to wisdom practice and confronting higher adaptation against any of the natural calamities.

Table 5*:* Flood affected home Religion Crosstabulation

			Religion		**Total**
			Hindu	Cristian	
Flood affected home	Yes	Count	104	1	105
		%	99.0%	1.0%	100.0%
	No	Count	105	0	105
		%	100.0%	0.0%	100.0%
Total		Count	209	1	210
		%	99.5%	0.5%	100.0%

Table 5 shows that total flood affected and non-household households were 210, among which flood-affected were 105. Religion-wise, 104 (99%) households were Hindus, and only 1 (1%) household is Christian. There were 105 non-flood-affected people, and among them all (100%) were Hindus. The study area's residents were Hindus, and the flood affected all the Hindu households vulnerable to Karnali River floods in Bardiya, Rajapur settlement management. Its gender and caste explained in Table 2 and 3.

Table 6: Flood affected home Mother Education Crosstabulation

			Mothers' Education					**Total**
			illiterate	Literate	SLC and 12	BA	MA and above	
Flood affected home	Yes	Count	6	75	21	3	0	105
		%	5.7%	71.4%	20.0%	2.9%	0.0%	100.0%
	No	Count	1	87	14	2	1	105
		%	1.0%	82.9%	13.3%	1.9%	1.0%	100.0%
Total		Count	7	162	35	5	1	210
		%	3.3%	77.1%	16.7%	2.4%	0.5%	100.0%

Table 6 shows that total households were 210, among which flood-affected mother-education households were 105. The Illiterate mothers were 6 (5.7%), the literate mothers were 75 (71.4%), the SLC/12 class was 21 (20%), and the bachelors were 3 (2.9%). There was no one found master or above at survey time. Non-flood-affected households were 210, among them, only 1 (1%) was illiterate, 87 (82.9%) were literate, SLC/12 class was 14 (13.3%), Batchelor level 2 (1.9%), and Master level only 1 was literate.

Nepal largest population More than one-third (35%) of females and 16% of males have no education, primary level (1-5 class) completed female was 6%, 19.9% completed lower secondary (6-8) 9.5% completed SLC or equivalent, and 19.5% and 19.5 percent have completed higher levels (above S.L.C. or equivalent) of education. In the research area Illiterates was 77.1%, SLC/12 (+2) was 16.7%, Bachelor level 2.4) and Master level only 1 (0.5%) were. The data shows that there was education level of female was less than national level status.

Table 7: Flood affected home Mother Job Crosstabulation

			Mothers Job		Total
			Government/Private	Other	
Flood affected home	Yes	Count	3	102	105
		%	2.9%	97.1%	100.0%
	No	Count	2	103	105
		%	1.9%	98.1%	100.0%
Total		Count	5	205	210
		%	2.4%	97.6%	100.0%

Table 7 shows total flood-affected and non-flood-affected households were 210, among them total flood affected households of 105. From flood affected households' mothers' job engagement was 3 (2.9%), and in non-flood affected households, it was only 2 (1.9%). They were engaged in Private jobs (Boarding schools and local Cooperatives). Nobody was found to engage in Government jobs, although in private (schools and cooperatives) they were in low-level jobs but not at officer level.
Women are engaged in agriculture 67%, only 8% engaged professional jobs and 17% engaged in sales and services. But in research area 67% engaged in house manager, 2.9% (flood- affected area) and 1.9% (non-flood affected area) were engaged in professional job.

5.2 Nutritional Status of Children:

Table 8: *Flood affected home Type Crosstabulation*

			Type of Home		Total
			Brick made	Mud and stone	
Flood affected home	Yes	Count	27	78	105
		%	25.7%	74.3%	100.0%
	No	Count	36	69	105
		%	34.3%	65.7%	100.0%
Total		Count	63	147	210
		%	30.0%	70.0%	100.0%

Table 8 shows that the total number of both flood-affected and non-affected households was 210, of which 50% were flood-affected. Flood affected areas made brick (permanent home, safer) 27 (25.7%), and Mud, wood, and stone made 78 (74.3%). Similarly, non-flood-affected area households made by bricks and cement were (permanent, safer) 36 (34.3%), and Kacchha (temporary) type homes were 69 (65.7%).
Most homes had temporary walls made from Khariya (dried plants), mud, and wood. Some houses were walls made from stone and mud, the Khariya and mud-made homes are Kacchha (temporary) homes and some houses were lanterned, most of the houses were temporary but, roofs covered by Galvanized sheet (Zasta sheet). They construct their home according to financial status (Reacher home linter poorer home temporary type), climate friendly, cultural acceptable and easily construction types.

Table 9: Flood affected home type of Toilet Crosstabulation

			Type of Toilet			Total
			No toilet	Permanent	Temporary	
Flood affected home	Yes	Count	1	42	62	105
		%	1.0%	40.0%	59.0%	100.0%
	No	Count	2	81	22	105
		%	1.9%	77.1%	21.0%	100.0%
Total		Count	3	123	84	210
		%	1.4%	58.6%	40.0%	100.0%

Table 9 shows that the total number of flood-affected and non-affected households was 210, of which 105 were flood-affected. The types of toilets affected by flooding were: permanent toilet 42 (40%); temporary toilet 62 (59%); and only 1 (1%) house had no toilet. Similarly, non-flood affected

households were 105; among them, permanent toilets were 42 (40%), temporary toilets were 22 (21%), and only 2 (1.9%) houses had no toilet.

Ninety-two percent population used an improved sanitation facility (flush/pour flush toilet), ventilated improved pit (VIP) latrine, pit latrine with slab and composting toilets constructed in Nepal. There is open defecation was 9% & 6% in rural and urban national figure

Same types of pour flush toilet constructed in research area. In the research area 98.6% people used permanent and temporary toilet. There is 1.5% open defecation in the research area. It is more than 6% of national data. The toilet constructed main reason was government or INGOs funding up to the base in construction.

Table 10: Flood affected home Toilet affected by flood Crosstabulation

			Toilet affected by flood		**Total**
			Yes	No	
Flood affected home	Yes	Count	105	0	105
		%	100.0%	0.0%	100.0%
	No	Count	0	105	105
		%	0.0%	100.0%	100.0%
Total		Count	105	105	210
		%	50.0%	50.0%	100.0%

Table 10 shows that the total number of flood-affected and non-affected households was 210, of which 105 were flood-affected. Total flood-affected households were 105 (100%) and non-flood-affected households were 105 (100%) during the flooding time.

Both flood-affected households (only 1%) and non-affected households (2.9%) have no toilet; otherwise, all households constructed toilets through government or NGOs subsidies. All the toilets were constructed up to the pan level, and the roof (used galvanized sheet for the roof) was permanent, but all the toilet walls were made temporarily, because there is no subsidy for the construction of toilet walls and roofs.

Table 11: Flood affected home Drinking water source Crosstabulation

			Drinking water source		**Total**
			Hand Pump	Supply Water	
Flood affected home	Yes	Count	105	0	105
		%	100.0%	0.0%	100.0%
	No	Count	105	0	105
		%	100.0%	0.0%	100.0%
Total		Count	209	1	210
		%	99.5%	0.5%	100.0%

Table 11 shows that as a source of drinking water, 100% of flood-affected and non-flood-affected households used hand pumps for drinking water.

Table 12: Flood affected home Water source polluted or not Crosstabulation

			Water source polluted or not		**Total**
			Polluted	Not	
Flood- affected home	Yes	Count	84	21	105
		%	80.0%	20.0%	100.0%
	No	Count	0	105	105
		%	0.0%	100.0%	100.0%
Total		Count	84	126	210
		%	40.0%	60.0%	100.0%

Table 12 shows that the total number of affected and non-affected households was 210, of which 105 were affected households. The respondents main drinking water source is a handpump. Polluted households were 84 (80%) and non-polluted households were 21 (20%); these households constructed their handpumps at high levels (flood could not damage high

The main source of drinking water in the research area was a handpump. Some household hand pumps were constructed at high levels; these hand pumps could not be polluted by floods. After reduced flood, clean and used hand pump water again. They used boiled water, bottle water and jar water during the camp stayed time.

Table 13: Distribution of age and sex

Flood affected							**Non-flood affected**						
	Boys		Girls		Total			Boys		Girls		Total	
AGE (mo)	no.	%	no.	%	no.	%	AGE (mo)	no.	%	no.	%	no.	%
30-41	22	52.4	20	47.6	42	40	30-41	11	25.6	32	74.4	43	41
42-53	24	57.1	18	42.9	42	40	42-53	12	36.4	21	63.6	33	31.4
54-59	9	42.9	12	57.1	21	20	54-59	16	55.2	13	44.8	29	27.6
Total	55	52.4	50	47.6	105	100	Total	39	37.1	66	62.9	105	100

Table 13 shows that the respondent's child distribution of age and sex wise in flood affected area was: boys 30-41 months were 22 (52.4%), 42-53 months were 24 (57.1%), 54-59 months were 9 (42.9%). Similarly, non-flood affected area girls were 30-41 months, 22 (52.4%), 42-53 months, 24 (57.1%), 54-59 months, 9 (42.9%). Similarly, age and sex wide total non-flood affected households were 105, in which total boys were 30-41 months 42 (40%), 42-53 months 42 (40%), 54-59 months 21 (20.0%) were. Similarly, total non-flood affected households were 105, in which total boys 30-41 months were 43 (41%), 42-53 months were 33 (31.4%), 754-59 months were 29 (20.6%). The total of 55 (52.4%), girls 50 947.6%) were in flood-affected areas. Total boys, 39 (37.15) and 66 (62,9%) were in the non-flood-affected area population.

Table 14: Prevalence of acute malnutrition based on weight-for-height z-scores by sex

F lood affected area				**Non-flood affected**			
	All	Boys	Girls		All	Boys	Girls
	n = 105	n = 55	n = 50		n = 105	n = 39	n = 66
Prevalence of global malnutrition	(55) 52.4 %	(25) 45.5 %	(30) 60.0 %	Prevalence of global malnutrition	(28) 26.7 %	(9) 23.1 %	(19) 28.8 %
(<-2 z-score and/or oedema)	(42.9 - 61.7 95% C.I.)	(33.0 - 58.5 95% C.I.)	(46.2 - 72.4 95% C.I.)	(<-2 z-score and/or oedema)	(19.1 - 35.8 95% C.I.)	(12.6 - 38.3 95% C.I.)	(19.3 - 40.6 95% C.I.)
Prevalence of moderate malnutrition	(27) 25.7 %	(10) 18.2 %	(17) 34.0 %	Prevalence of moderate malnutrition	(16) 15.2 %	(5) 12.8 %	(11) 16.7 %
(<-2 z-score and >=-3 z-score, no oedema)	(18.3 - 34.8 95% C.I.)	(10.2 - 30.3 95% C.I.)	(22.4 - 47.8 95% C.I.)	(<-2 z-score and >=-3 z-score, no oedema)	(9.6 - 23.3 95% C.I.)	(5.6 - 26.7 95% C.I.)	(9.6 - 27.4 95% C.I.)
Prevalence of severe malnutrition	(28) 26.7 %	(15) 27.3 %	(13) 26.0 %	Prevalence of severe malnutrition	(12) 11.4 %	(4) 10.3 %	(8) 12.1 %
(<-3 z-score and/or oedema)	(19.1 - 35.8 95% C.I.)	(17.3 - 40.2 95% C.I.)	(15.9 - 39.6 95% C.I.)	(<-3 z-score and/or oedema)	(6.7 - 18.9 95% C.I.)	(4.1 - 23.6 95% C.I.)	(6.3 - 22.1 95% C.I.)

Table 14 shows that the prevalence of acute malnutrition based on weight-for height z-score by sex was 105, in which the prevalence of global malnutrition was 55 (52.4%), prevalence of moderate

malnutrition was 27 (25.7%) and the prevalence of severe malnutrition was 28 (26.7%). Similarly, total boys were 55 (52.4%), prevalence of moderate malnutrition was 10 (18.2%) and the prevalence of severe malnutrition was 15 (27.3%). Total girls were 50, among whom prevalence of global malnutrition was 30 (60%); prevalence of moderate malnutrition was 17 (34%) and prevalence of severe malnutrition was 13 (26.0%).

Similarly, the prevalence of acute malnutrition based on weight-for height z-score by sex wise, total non-flood affected households was 105, in which the prevalence of global malnutrition was 28 (26.6%), prevalence of moderate malnutrition was 16 (15.2%) and the prevalence of severe malnutrition was 12 (11.4%). The total number of boys was 39, of which prevalence of global malnutrition was 9 (23.1%), prevalence of moderate malnutrition was 5 (12.8%) and prevalence of severe malnutrition was 4 (10.3%). Similarly, girls were 66, of whom the prevalence of global malnutrition was 19 (28.8%), prevalence of moderate malnutrition was 11 (16.7%) and prevalence of severe malnutrition was 8 (12.1%).

The prevalence of acute malnutrition based on weight-for-height z-scores by sex shows that flood-affected area child malnutrition results or reports showed double that of non-flood-affected area children.

Table 15 shows that total flood affected households were 105, in which prevalence of acute malnutrition by age, based on weight-for-height z-score severe wasting 30-41 months was 13 (31%), 42-53 months was 8 (19.0%), and 54-59 months was 7 (33.3%). Similarly, moderate wasting 30-41 months was 13 (31%), 42-53 months was 8 (19%), and 54-59 months was 6 (28.6%). Normally, 30-41 months had 16 (38.1%), 42-53 months had 26 (61.9%), and 54-59 months had 8 (38.1%). Similarly, in the non-flood-affected households 105, the prevalence of acute malnutrition by age, based on weight-for-height z-score severe wasting 30-41 months 5 (11.6%), 42-53 months 3 (9.1%), and 54-59 months 3 (10.3%), Similarly, moderate wasting 30-41 months was 10 (23.3%), 42-53 months was 3 (19%), and 54-59 months was 4 (13.8%). Normally, 30-41 months were 28 (65.1%), 42-53 months were 27 (81.8%), and 54-59 months were 22 (75.9%).

Table 15 : Prevalence of acute malnutrition by age, based on weight-for-height z-scores

Flood affected								**Non-flood affected**							
Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%
30-41	42	13	31	13	31	16	38.1	30-41	43	5	11.6	10	23.3	28	65.1
42-53	42	8	19	8	19	26	61.9	42-53	33	3	9.1	3	9.1	27	81.8
54-59	21	7	33.3	6	28.6	8	38.1	54-59	29	4	13.8	3	10.3	22	75.9
Total	105	28	26.7	27	25.7	50	47.6	Total	105	12	11.4	16	15.2	77	73.3

The report shows that the prevalence of acute malnutrition by age, based on weight-for-height z-score, flood- affected area households were105, in which severe wasting was 28 (26.7%), moderate wasting was 27 (25.7%), and normal wasting was 50 (47.7%). Similarly, non-flood affected households were 105, among them, severe wasting was 12 (11.46%), moderate wasting was 16 (15.2%), and normal wasting was 77 (73.3%).

The NDHS report shows 8% wasted, with 1% severely wasted. The research area flood- affected data showed 25.7% wasting and severely wasting 26.7%, in the non-flood-affected area, wasting was 15.2% and severely wasting was 11.46%. The report shows significantly more wasting in flood-affected and non-flood-affected areas than NDHS data.

Table 16: Prevalence of underweight based on weight-for-age z-scores by sex

Flood affected				**Non-flood affected**			
	All	Boys	Girls		All	Boys	Girls
	n = 105	n = 55	n = 50		n = 105	n = 39	n = 66
Prevalence of underweight	(50) 47.6 %	(21) 38.2 %	(29) 58.0 %	Prevalence of underweight	(24) 22.9 %	(9) 23.1 %	(15) 22.7 %
(<-2 z-score)	(38.3 - 57.1 95% C.I.)	(26.5 - 51.4 95% C.I.)	(44.2 - 70.6 95% C.I.)	(<-2 z-score)	(15.9 - 31.8 95% C.I.)	(12.6 - 38.3 95% C.I.)	(14.3 - 34.2 95% C.I.)
Prevalence of moderate underweight	(27) 25.7 %	(7) 12.7 %	(20) 40.0 %	Prevalence of moderate underweight	(16) 15.2 %	(6) 15.4 %	(10) 15.2 %
(<-2 z-score and >=-3 z-score)	(18.3 - 34.8 95% C.I.)	(6.3 - 24.0 95% C.I.)	(27.6 - 53.8 95% C.I.)	(<-2 z-score and >=-3 z-score)	(9.6 - 23.3 95% C.I.)	(7.2 - 29.7 95% C.I.)	(8.4 - 25.7 95% C.I.)
Prevalence of severe underweight	(23) 21.9 %	(14) 25.5 %	(9) 18.0 %	Prevalence of severe underweight	(8) 7.6 %	(3) 7.7 %	(5) 7.6 %
(<-3 z-score)	(15.1 - 30.7 95% C.I.)	(15.8 - 38.3 95% C.I.)	(9.8 - 30.8 95% C.I.)	(<-3 z-score)	(3.9 - 14.3 95% C.I.)	(2.7 - 20.3 95% C.I.)	(3.3 - 16.5 95% C.I.)

Table 16 shows that total flood households were 105, in which prevalence of underweight based on weight-for-age z-scores by sex was 55, in which prevalence of underweight was 21 (38.2%), prevalence of moderate underweight was 7 (12.7%), and prevalence of severe underweight was 14 (25.5%). Similarly, girls were 50, in which the prevalence of underweight was 29 (58.0%), the prevalence of moderate underweight was 20 (40.0%), and the prevalence of severe underweight was 9 (18.0%).
Similarly, total non-flood households were 105, in which the prevalence of underweight based on weight-for-age z-scores by sex was 39, in which the prevalence of underweight was 9 (23.1%), the prevalence of moderate underweight was 6 (15.4%), and the prevalence of severe underweight was 3 (7.7%). Similarly, girls were 66, with a prevalence of underweight of 15 (22.7%), moderate underweight of 10 (15.2%), and severe underweight of 5 (7.6%).
In total, flood affected households were 105, with a prevalence of underweight based on weight-for-age z-scores by sex of 50 (47.6%), a prevalence of moderate underweight of 27 (25.7%), and a prevalence of severe underweight of 23 (21.9%). Total Non-flood-affected households were 105, among them, prevalence of underweight was all 24 (22.9%), prevalence of moderate underweight was 16 (15.2%), and prevalence of severe underweight was 8 (7.6%).

Table 17 : Prevalence of underweight by age, based on weight-for-age z-scores

Flood affected								**Non-flood affected**							
Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%
30-41	42	14	33.3	14	33.3	14	33.3	30-41	43	6	14	6	14	31	72.1
42-53	42	6	14.3	9	21.4	27	64.3	42-53	33	1	3	8	24	24	72.7

54-59	21	3	14.3	4	19	14	66.7	54-59	29	1	3.4	2	6.9	26	89.7
Total	105	23	21.9	27	25.7	55	52.4	Total	105	8	7.6	16	15	81	77.1

Table 17 shows that the total number of flood-affected households was 105, in which the prevalence of underweight by age, based on weight-for-age z-scores, was as follows: Boys 30-41 months were severely underweight, 14 (33.3%), 42-53 months were 6 (14.3%), and 54-59 months were 3 (14.3%). Moderately underweight 30–41 months: 14 (33.3%), 42–53 months: 9 (21.4%), and 54–59 months: 4 (19%). Normal 30-41 months were 14 (33.3%), 42-53 months were 27 (64.3%), and 54-59 months were 14 (66.7%). Similarly, the total number of non-floods affected households was 105, in which the prevalence of underweight by age, based on weight-for-age z-scores, was as follows: Girls aged 30-41 months were severely underweight at 6 (14%), 42-53 months at 1 (3%), and 54-59 months at 1 (3.4%). Moderately underweight (30–41 months) 6 (14%), 42–53 months: 8 (24%), and 54–59 months: 2 (6.9%). Normal 30-41 months were 31 (72.1%), 42-53 months were 24 (72.7%), and 54-59 months were 26 (89.7%). Total flood-affected households were severe underweight at 23 (21.9%), moderate underweight at 27 (25.7%), and normal at 55 (52.4%). Similarly, non-flood-affected households totalled severely underweight 8 (7.6%), moderately underweight 16 (15%), and normal 81 (77%).

The NDHS report shows 19% were underweight, with 4% severely underweight. There were 25.7% underweight, 21.9% severely underweight, and 15% underweight and 7.6% severely underweight in the flood-affected area. The data shows that both flood-affected and non-flood-affected area children are more underweight than overall national NDHS data.

Table 18: Prevalence of stunting based on height-for-age z-scores and by sex

Flood affected				**Non-flood affected**			
	All	Boys	Girls		All	Boys	Girls
	n = 105	n = 55	n = 50		n = 105	n = 39	n = 66
Prevalence of stunting	(20) 19.0 %	(8) 14.5 %	(12) 24.0 %	Prevalence of stunting	(17) 16.2 %	(9) 23.1 %	(8) 12.1 %
(<-2 z-score)	(12.7 - 27.6 95% C.I.)	(7.6 - 26.2 95% C.I.)	(14.3 - 37.4 95% C.I.)	(<-2 z-score)	(10.4 - 24.4 95% C.I.)	(12.6 - 38.3 95% C.I.)	(6.3 - 22.1 95% C.I.)
Prevalence of moderate stunting	(16) 15.2 %	(6) 10.9 %	(10) 20.0 %	Prevalence of moderate stunting	(12) 11.4 %	(7) 17.9 %	(5) 7.6 %
(<-2 z-score and >=-3 z-score)	(9.6 - 23.3 95% C.I.)	(5.1 - 21.8 95% C.I.)	(11.2 - 33.0 95% C.I.)	(<-2 z-score and >=-3 z-score)	(6.7 - 18.9 95% C.I.)	(9.0 - 32.7 95% C.I.)	(3.3 - 16.5 95% C.I.)
Prevalence of severe stunting	(4) 3.8 %	(2) 3.6 %	(2) 4.0 %	Prevalence of severe stunting	(5) 4.8 %	(2) 5.1 %	(3) 4.5 %
(<-3 z-score)	(1.5 - 9.4 95% C.I.)	(1.0 - 12.3 95% C.I.)	(1.1 - 13.5 95% C.I.)	(<-3 z-score)	(2.1 - 10.7 95% C.I.)	(1.4 - 16.9 95% C.I.)	(1.6 - 12.5 95% C.I.)

Table 18 shows the prevalence of stunting based on height-for-age z score and by sex. Total flood-affected boys were 55, of whom the prevalence of stunting boys was 8 (14.5%), the prevalence of moderate stunting was 6 (10.9%), and the prevalence of severe stunting was 2 (3.6%). Similarly, girls' prevalence of stunting was 12 (24%), the prevalence of moderate stunting was 10 (20.0%), and the prevalence of severe stunting was 2 (4.0%).

The non-flood affected households' total boys were 39, of which the prevalence of stunting based on height-for-age z score of boys' prevalence of stunting was 9 (23.1%), the prevalence of moderate

stunting was 7 (17.9%), and the prevalence of severe stunting was 2 (5.1%). Similarly, girls' prevalence of stunting was 8 (12.1%), the prevalence of moderate stunting was 5 (7.6%), and the prevalence of severe stunting was 3 (4.5%).

Table 19: Prevalence of stunting by age based on height-for-age z-scores

Flood affected									Non-flood affected							
Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-core)		Normal (> = -2 z score)		Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%
30-41	42	2	4.8	10	23.8	30	71	30-41	43	3	7	8	18.6	32	74.4
42-53	42	2	4.8	4	9.5	36	86	42-53	33	1	3	3	9.1	29	87.9
54-59	21	0	0	2	9.5	19	91	54-59	29	1	3.4	1	3.4	27	93.1
Total	105	4	3.8	16	15.2	85	81	Total	105	5	4.8	12	11.4	88	83.8

Table 19 shows the total number of flood-affected households (105), in which the prevalence of stunting by age is based on height-for-age z-scores for severe stunting 30-41 months 2 (4.8%) and 42-53 months 2 (4.8%) only. 42–53 months: 9 (21.4%), 54–59 months: 4 (19%). Normal 30-41 months: 14 (33.3%), moderate stunting 30-41 months: 10 (23.8%), 42-53 months: 4 (9.5%), and 54-59 months: 2 (9.0%) Normal 30-41 months were 30 (71%), 42-53 months were 36 (86%), and 54-59 months were 19 (91%). Similarly, in total non-flood-affected households (105), the prevalence of underweight by age, based on weight-for-age z-scores of 30-41 months, severe stunting was 6 (7%), 42-53 months was 1 (3%) and 54-59 months was 1 (3.4%). Moderately underweight children aged 30-41 months were 8 (18.6%), 42-53 months were 3 (9.1%), and 54-59 months were 1 (3.4%). Normal 30-41 months were 32 (74.4 %), 42-53 months were 29 (87.9%), and 54-59 months were 27 (93.1%).

Total flood affected households were 105, in which the prevalence of stunting by age based on height-for-age z-scores was severe stunting (4 93.8%), moderate stunting (16 15.2%), and normal 85 (81.0%). Similarly, non-flood affected households were 105, of which moderate stunting was 5 (4.8%), moderate stunting was 12 (11.5%), and normal stunting was 88 (83.8%).

Total flood-affected households had severe stunting of 4 (3.8%), moderate stunting of 16 (15.2%), and normal stunting of 12 (11.4%). Similarly, non-flood-affected households had severe stunting (5.8%), moderate underweight (12.4%), and normal 88 (83.8%).

According to research report there was moderate stunting 15.2% and severe stunting 3.8% in flood-affected area and severe stunting 4.8% and moderated stunting 11.4% in non-flood -affected area. The NDHS shows overall 25% stunted and 6% severely stunted. It is better than overall NDHS data in research area.

The NDHS's household survey report for Nepal sums up the following points in 2022:

- The trends in the prevalence of stunting and underweight among children under age 5 decreased markedly between 1996 and 2022, from 57% to 25% and from 42% to 19%, respectively. At the same time, wasting declined from 15% in 1996 to 8% in 2022.
- Fifty-four percent of children reported to be very small at birth are stunted, and 49% are underweight. In contrast, only 22% of children reported to be average or larger at birth are stunted, and only 17% are underweight.
- The proportion of children who are stunted is highest in the mountain zone (42%), while the proportion of wasting is highest in the terai zone (10%).
- The prevalence of stunting, wasting, and underweight is higher among children whose mothers are thin (33%, 17%, and 35%, respectively) than among those whose mothers have a normal

body mass index (26%, 7%, and 19%, respectively).

- The prevalence of stunting, wasting, and underweight is higher among children born to mothers with no education (36%, 10%, and 30%, respectively) than among children born to mothers with a basic education or higher.
- Stunting is nearly threefold higher among children from the lowest wealth quintile (37%) than among children from the highest wealth quintile (13%) (Ministry of Health and Population, USAID, 2022, p. 276 & 277).

Table 20: Height in Cm Correlations

		Weight kg
Height cm	Pearson Correlation	.746**
	Sig. (2-tailed)	.000
	N	210
**. Correlation is significant at the 0.01 level (2-tailed).		

Table 20 shows that there is a significant correlation between height and weight because the p-value of each relationship is less than 0.01. So, it indicates that if there is a 1-point change in height, then it can bring a change of.746 point in weight.

Table 21: Mid Upper Arm Circumference (MUAC) status:

			Types of respondents		**Total**
			Flood affected	Non-affected	
MUAC	Red	Count	0	1	1
		%	0.0%	100.0%	0.5%
	Green	Count	105	104	209
		%	100.0%	99.0%	99.5%
Total		Count	105	105	210
		%	100.0%	100.0%	100.0%

Table 21 shows that there were 105 total flood-affected households, of which severe malnutrition (Red) accounts for 0%, Moderate malnutrition (yellow) accounts for 0%, and Normal (Green) accounts for 100% of the mid-upper arm circumference measurement. Similarly, non-flood-affected total households were 105, of which severe malnutrition (Red) was 1 (1%), Moderate malnutrition (yellow) was 0%, and Normal (Green) was 104 (99%) of the mid-upper arm circumference (MUAC) measurement.

Table 22: MUAC, flood-affected and non-affected households' gender wise

			Gender							
			Boy		**Girl**			**Total**		
			MUAC	Total	MUAC		Total	MUAC		Total
			Green		Red	Green		Red	Green	
Flood_ affected_ home	Yes	Count	55	55	0	50	50	0	105	105
		%	58.5%	58.5%	0.0%	43.5%	43.1%	0.0%	50.2%	50.0%
	No	Count	39	39	1	65	66	1	104	105
		%	41.5%	41.5%	1.0%	56.5%	56.9%	100.0%	49.8%	50.0%
Total		Count	94	94	1	115	116	1	209	210
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 22 shows that total flood-affected households were 105, of which gender-wise, boys were 55 (58.5%), and girls were 50 (43.5%). Similarly, non-affected households' total boys were green: 39 (41.5%), girls were red: only 1 (1.0%), and green: 65 (56.5%).

Table 23: Weight and MUAC of flood-affected HHs gender wise

			Gender					
			Boy		Girl		Total	
			MUAC Green	Total	MUAC Green	Total	MUAC Green	Total
Weight	Below 9.5 kg	Count	2	2	4	4	6	6
		%	3.6%	3.6%	8.0%	8.0%	5.7%	5.7%
	9.5 to 10 kg	Count	9	9	13	13	22	22
		%	16.4%	16.4%	26.0%	26.0%	21.0%	21.0%
	10 to 11 kg	Count	7	7	9	9	16	16
		%	12.7%	12.7%	18.0%	18.0%	15.2%	15.2%
	Above 11 kg	Count	37	37	24	24	61	61
		%	67.3%	67.3%	48.0%	48.0%	58.1%	58.1%
Total		Count	55	55	50	50	105	105
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 23 shows that the weight and MUAC of flood-affected HHs were gender-wise below 9.5 kg for boys 2 (3.6%), girls 4 (4%), 9.5 to 10 kg for green boys 9 (16.4%), girl 13 (26%), 10 to 11 kg green boys 7 (12.7%) and girls 9 (18%), above 11 kg for green boys 37 (67.3%) and girl 24 (48%).

Table 24: Height and MUAC of flood-affected HHs gender wise

			Gender					
			Boy		Girl		Total	
			MUAC Green	Total	MUAC Green	Total	MUAC Green	Total
Height	Below 80cm	Count			1	1	1	1
		%			2.0%	2.0%	1.0%	1.0%
	80 to 85cm	Count	2	2	2	2	4	4
		%	3.6%	3.6%	4.0%	4.0%	3.8%	3.8%
	85-90cm	Count	5	5	10	10	15	15
		%	9.1%	9.1%	20.0%	20.0%	14.3%	14.3%
	Above 90cm	Count	48	48	37	37	85	85
		%	87.3%	87.3%	74.0%	74.0%	81.0%	81.0%
Total		Count	55	55	50	50	105	105
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 24 shows that height and MUAC of flood-affected HHs were gender-wise: total flood-affected HHs were 105, of which below 80 cm green girl 1 (2%) only, 80-90 cm MUAC green boys 2 (3.6%) and girls 2 (4%) were, 85-90 cm green boys 5 (9.1%), green girls 10 (20%) were, above 90 cm green boys 48 (87.3%) and girls 37 (74%) were.

Table 25: Weight and MUAC of non-flood affected HHs gender wise

			Gender							
			Boy		Girl			Total		
			MUAC Green	Total	MUAC Red	Green	Total	MUAC Red	Green	Total
Weight	Below 9.5 kg	Count			1	2	3	1	2	3
		%			100.0%	3.1%	4.5%	100.0%	1.9%	2.9%
	9.5 to 10 kg	Count	2	2	0	5	5	0	7	7
		%	5.1%	5.1%	0.0%	7.7%	7.6%	0.0%	6.7%	6.7%
	10 to 11 kg	Count	3	3	0	9	9	0	12	12
		%	7.7%	7.7%	0.0%	13.8%	13.6%	0.0%	11.5%	11.4%
	Above 11 kg	Count	34	34	0	49	49	0	83	83
		%	87.2%	87.2%	0.0%	75.4%	74.2%	0.0%	79.8%	79.0%
Total		Count	39	39	1	65	66	1	104	105

	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 25 shows that weight and MUAC of non-flood affected HHs below 9.5 kg MUAC were red girls only 1, and green girls 2 (3.1%) were, 9.5-10 kg green boy 2 (5.1%), girls green 5 (7.7%), 10-11 kg green boy 3 (7.7%), green girls 9 (13.8%), and above 11 kg green boys 34 (87.2%), and green girls 49 (75.4%) were.

Table 26: Height and MUAC of non-affected HHs gender wise

			Gender							
			Boy		**Girl**			**Total**		
			MUAC	Total	MUAC		Total	MUAC		Total
			Green		Red	Green		Red	Green	
Height	80 to 85cm	Count	1	1	1	2	3	1	3	4
		%	2.6%	2.6%	100.0%	3.1%	4.5%	100.0%	2.9%	3.8%
	85-90cm	Count	4	4	0	9	9	0	13	13
		%	10.3%	10.3%	0.0%	13.8%	13.6%	0.0%	12.5%	12.4%
	Above 90cm	Count	34	34	0	54	54	0	88	88
		%	87.2%	87.2%	0.0%	83.1%	81.8%	0.0%	84.6%	83.8%
Total		Count	39	39	1	65	66	1	104	105
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 26 shows that height for MUAC gender-wise is not below 80 cm; 80-85 cm were green boys 1 (2.6%), red girls only 1(1%), and green girls 2 (3.1%) were, above 90 cm green boys 34 (87.2%), green girls 54 (83.1%) were.

A quick and straightforward body measurement called the MUAC is frequently used for screening in emergency settings as well as for nutrition surveys in development environments. Use MUAC to quickly determine nutritional status in emergency settings (World Vision, 2011, p. 63) [2]. This all draw attention to recommend further research in the area focused to Housing practice and risk management in relation to maintain healthy and productive human in the particular locality[25-30].

6. CONCLUSIONS :

Tharu are the ethnic group of Terai, Nepal. They are the Nepali lands of western Nepal. Their dense habitats are located in Banke, Bardiya, Kailali, and Kanchanpur districts of Nepal. They are either hilly area of Madesi; they are separate, but they are tribe communities of Terai, Nepal.

The findings show that the flood came in Karnali, the river in monsoon time from the Himalaya via the hills, and collected water in precipitation rain time in monsoon time during July and August in Nepal. Yearly, such floods come 1-3 times and cause damage to the beaches of the Karnali River in Rajapur, Bardia, Nepal. The research outcomes show that flood-affected children suffer more malnutrition than non-flood-affected area children. At the time of the flooding, all things stopped due to the Karnali River flooding. Affected participants stayed in flood refugee camps like community buildings, School buildings, and Godam buildings. They have faced more problems during flooding, such as no food, no clothes, scarcity of drinking water, children becoming ill, treatment problems, no light, etc. The Nepalese government built a dam on the Karnali River's beach, but floodwaters rose to 14 meters, destroying the dam and flooding human neighbourhoods.

Respondents request for a residential area could have come from a flood-affected location because everything (land, relatives, culture) is here. The government prepared a long-term Karnali River flood management plan and implemented it. It is implemented through municipalities, other government organizations, provinces, and the central government, which helps local governments. Second, construct other community-level buildings for people to easily stay with goods during the flooding time. Third, help every flood victim at the camps with food, clothing, water, medicine, and a torch during the flooding duration. Fourth, help poorer people maintain their homes, hand pumps, and toilets after returning from floods through local government.

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