Nutrition Survey Report
JAJARKOT DISTRICT, NEPAL

Report Submitted to:

Concern Worldwide- Nepal

Report submitted by:

Sustainable Development Initiative Network-Nepal

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List of Acronyms

ACF	Action Contre la Faim
CBS	Central Bureau of Statistics
CI	Confidence Interval
CMAM	Community Based Management of Malnutrition
FCHV	Female Community Health Volunteer
GAM	Global Acute Malnutrition
H/A	Height for Age
HDDS	Household Dietary Diversity Score
HDI	Human Development Index
HF	Health Facility
HP	Health Post
IDDS	Individual Dietary Diversity Score
INGO	International Non Governmental Organisation
MAM	Moderate Acute Malnutrition
MIHFP	Months of Insufficient Household Food Provision
MOHP	Ministry of Health and Population
MUAC	Mid Upper Arm Circumference
NCHS	National Centre for Health Services
NGO	Non Governmental Organisation
OTP	Outpatient Therapeutic Programme
PHC	Primary Healthcare Centre
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SHP	Sub Health Post
SUDIN	Sustainable Development Initiative Network Nepal
UNICEF	United Nations Children's Fund
VDC	Village Development Committee
W/H	Weight for Height
WHO	World Health Organisation

Executive Summary

In December 2008, Sustainable Development Initiative Network (SUDIN) -Nepal conducted on request of Concern Worldwide a nutrition survey in Jajarkot district, mid western development region of Nepal. The Jajarkot nutrition survey serves as a baseline survey carried out for the Community Based Management of Acute Malnutrition (CMAM) pilot project. The survey was conducted from 15th December 2008 to 5th January 2009. The survey methodology used by SUDIN-NEPAL in Jajarkot was agreed by Concern Worldwide and had been already piloted during the Bardiya nutrition survey back in May 2008. The survey was conducted using a 30 × 30 cluster sampling methodology with two stage random sampling. Data entry and analysis of anthropometric measurements was done using ENA SMART software and the entire data base for the data entry of household information was done in EPI Info software. Data analysis was done by using the statistical program STATA version 10 and SPSS version 13.

Anthropometric data of children 6 to 59 months was collected, weight, height, MUAC and age recorded. In addition detailed household, water and sanitation, food consumption and child health and nutrition information was collected by interviewing mothers/ caretakers of children of selected households. The objective of this survey is to identify causal factors, feeding and caring practices that might contribute to good nutrition or malnutrition within Jajarkot District.

Anthropometry

- The prevalence of GAM (WHO reference, Z-score) in Jajarkot is 10.5% (7.90 – 12.8, 95% C.I.) with SAM 2.4% (0.7-3.8, 95% C.I.). According to the WHO classification Jajarkot faces a serious nutrition situation (GAM between 10-14%).
- GAM and SAM rates found during surveys in other possible CMAM pilot districts are higher. However the Jajarkot survey is the only survey where the data collection fell into a food secure time and higher malnutrition rates can be expected in Jajarkot during food insecure months.
- Using MUAC one third of the surveyed children were found to be at risk (>=125 and <135mm) of becoming moderately malnourished.
- Age data provided by care givers was unconfirmed in most cases and therefore no chronic malnutrition and underweight rates were calculated.
- No significant correlation was found between gender and malnutrition.
- Children younger than 24 months are significantly more often malnourished than older children (>= 24 months).

Health Seeking Behaviour

- Just above half of the sick children were brought for medical treatment, out of this two third to government health facilities and one third to private health care providers.
- The quality of government health services was perceived poor by many caretakers.

Household Information

- Children of illiterate fathers have a significant higher risk of being malnourished. No correlation was found between malnutrition and the literacy status of mothers.
- Lower caste children (Kami, Damai, Sarki, Gaine, Badi, Chamar, Chandara, Tamata etc) were found to be three times more likely to be malnourished than children of the middle castes (Magar, Tamang, Rai, Limbu, Sherpa, Byansi, Dura, Kumal, etc).
- Both SAM and MAM were observed high in households having casual labour (porter, daily wages) and farming (crop, livestock and fish) as means of livelihood.
- No correlation was found between malnutrition and proxy indicators for the economic wealth of a household (construction materials of the house, ownership of land and livestock).

Water and Sanitation

- In general hand washing practices were found to be good (after latrine use, before eating and cooking) however the use of soap is not common in two third of the households.
- One quarter of households rely on unprotected sources for drinking water. Water treatment is not common at all.
- No significant correlation was identified between malnutrition and water/sanitation related practices.

Household Food and Nutrition Situation

- In the past 12 months, three quarters of the households experienced at least one time of food shortage, mainly caused by depleted food stocks in the months July/August and March/April.
- Household dietary diversity is based on cereals and vegetables with oil and pulses.

Child Health and Nutrition

- Children's diet is less energy dense, little diverse, less rich in vitamins and minerals than the diet of the household. Together with the insufficient meal frequency it can be said that children in most households do not receive an adequate nutrient intake in portions they can digest.
- Children breastfed exclusively for up to three months only had a significant higher risk of becoming malnourished than children exclusively breastfed for up to six months.
- The feeding of colostrum is not significantly correlated with less malnutrition. However more children were found to be malnourished not having received colostrum.
- Even if not significantly linked and only based on very few cases, grandmothers/ mothers in law as care givers seem to have a more negative influence on the child's nutritional status than the mothers themselves whereby siblings younger than 15 years seem to have a positive influence on their younger brothers and sisters.

Recommendations

1. The prevalence of global acute malnutrition indicates a significant public health problem in Jajarkot district. Therefore a nutrition program such as CMAM (community based management of acute malnutrition) is recommended to address the nutrition problem in Jajarkot district.

2. The literacy status of fathers is significantly linked to the prevalence of malnutrition. Therefore the government's policy to provide free education to both boys and girls is likely to contribute to the reduction of malnutrition in Nepal in long-term. Studies on how exactly literacy influences child nutrition at household level could help to further advocate for importance of education.

3. CMAM has to ensure inclusion of low caste groups into the programme. Important is:
   - disaggregated data collection
   - home visits to those with possible higher social barriers to access
   - flexible time frames at OTP (outpatient therapeutic program) facilities taking high work load of the poor into consideration
   - covering of transport costs for referral to inpatient treatment facilities
   - availability of free high quality medical services and drugs at government health facilities

4. Trust into the quality of government health services was found to be low among interviewees resulting into a low rate of children brought for the free medical treatment at the government run health facilities in case of illness. It is recommended that the CMAM project coordinates closely with the MOHP at district, regional and national level to ensure improvement of quality of health services including the availability of free medicines at all times according to the government's policy.

5. The private health service providers and FCHVs should be included in the implementation of the CMAM project and a strong referral system through them should be established by the project to the nearest outpatient and inpatient treatment facilities.

6. A nutrition education package should be developed for care takers particularly grandmothers/ mothers in law covering the following topics:
   - utilisation of soap for hand washing
   - water treatment
   - food diversity with special focus on importance of milk, fruits and vegetables for children

- provision of three meals plus two snacks per day for children below five (introducing fruits as snacks)
- feeding practices during periods of illness
- meaning, importance and duration of exclusive breastfeeding and links between nutritional status/ fluid intake of mothers and quantity of breast milk

7. The nutrition intervention should look into the possibility of including children at risk of becoming malnourished (using MUAC) into a special prevention programme e.g. nutrition counselling to care takers by FCHVs at community level.

8. The CMAM project should look into advocacy for latrine construction and usage or even be linked to a water and sanitation programme in general.

9. For the causal analysis it is recommended to revise the survey questionnaire to also assess the nutritional status of mothers and to link the findings to child malnutrition.

10. Further analyse feeding practices of the new-born to better understand reasons for low acceptance of colostrum and the believe about additional required fluids provided after birth, after stopping exclusive breastfeeding and before introducing first semi-solid foods.

11. To better understand risk factors contributing to malnutrition the positive influencing characteristics of their contraries might be worse researching.
    - What are the middle caste households doing better than the households of the higher castes?
    - How is the father using his education for positively influencing his children's nutritional status?
    - What do care takers of low caste well nourished children below 24 months of age do different which could be replicated by low caste families with malnourished children?

CHAPTER 1

1 Background and Introduction

1.1 Background

Nepal is a land-locked country located at the foothills of the Himalayas. It occupies an area from 26º 22' to 30º 27' north latitude and 80º 4' to 88º 12' east longitude with elevation ranging from 90 to 8,848 meters. The country is sandwiched between the two most populous countries of the world, India to the east, south, and west and China to the north. Nepal is rectangular in shape and stretches 885 kilometres in length (east to west) and 193 kilometres in width (north to south). The total land area of the country is 147,181 square kilometres. The population of Nepal is just over 26.6 million (Central Bureau of Statistics, 2006). Nepal is divided into three distinct ecological zones. These are the mountain, hill, and Terai (or plains). The mountain zone accounting for 35% of the total land area, ranges in altitude from 4,877 to 8,848 meters above sea level and covers a land area of 51,817 square kilometres. For administrative purposes there are five development regions in Nepal - Eastern, Central, Western, Mid-western and Far-western. Nepal is divided into 14 zones and 75 administrative districts. Districts are further divided into smaller units, called village development committees (VDCs) and municipalities. Currently there are 3915 VDCs and 58 municipalities. Each VDC is composed of nine wards, with the number of wards in each municipality ranging from nine to 35. Kathmandu is the capital city as well as the principal urban centre of Nepal (Central Bureau of Statistics, 2006a). The 2001 Census listed 103 diverse ethnic/caste groups, each with its own distinct language and culture (Central Bureau of Statistics, 2003). The percentage breakdown by size of the major groups is as follows: Chhetri (16%), Brahmins (13%), Magar (7%), Tharu (7%), Tamang (6%), and Newar (5%). The 2001 Census has also identified about 92 mother tongues. Most of these languages are originated from two major groups: the Indo-Europeans, who constitute about 79% of the population, and the Sino-Tibetans, who constitute about 18% of the population. Nepali is the official language of the country and is the mother tongue of about half of the population. However, it is used and understood by most people in the country. The other two major languages are Maithili and Bhojpuri, spoken by about 12% and 8% of the population, respectively. According to the 2001 Census, the majority of Nepalese are Hindus (81%), while 11% are Buddhist, 4% are Muslims and 4% are Kirant (Central Bureau of Statistics, 2003).

1.2 Introduction

The population of Nepal is 26.6 million and a GNI per capita US$ 290 (UNICEF, 2006). Nepal is ranked 138 on the 2006 Human Development Index (HDI). Life expectancy is about 61 years and adult literacy rate is 48.6. Nepal's women have a total fertility rate of 3.7 with over half of the births attended by relatives and only 15% by trained personnel. This fact leads to a high number of maternal deaths (a Maternal Mortality Ratio of over 500 per hundred thousand live births) with 21% of the infants having a low birth weight. The 2006 HDI states a national Infant Mortality Rate of 59 per thousand live births. For the 20% of the poorest population an

Infant Mortality Rate of 86 is indicated. The same discrepancy is visible for the Under-five Mortality rate. While the average national Under-five Mortality is indicated with 76, for the 20% of the poorest population this rate is as high as 130. Access to and quality of health care services available to the Nepalese population depends strongly on the economic status of the service seekers and whether living in an urban or rural setting.

Figure 1: Map of Jajarkot

Jajarkot district is located in the hills of the Mid-Western Development Region, Bheri Zone which is one of the 15 districts of the region. Jajarkot district is neighbouring with Rukum, Dolpa, Jumla, Kalikot, Dailekh, Surkhet and Salyan. The district headquarters Khalanga is situated to the south- east of the district. According to the Central Bureau of Statistics (CBS 2006) the district covers an area of 2,230 km².

The total population of Jajarkot is 134, 868, out of which 68,508 are female and 66,360 are male. The population density of this district is 60 persons per km² and the population growth rate is 1.68. The maximum temperature of the district is 34 degree Celsius and the minimum temperature is 8 degree Celsius. Among the entire district of the Mid West Development Region, Jajarkot has less fertile agriculture land and most of the agriculture land is loam soil. Only 49.4% of the population of Jajarkot are having access to safe drinking water and there is only two to three hours electricity in a day. Most of the population (99.85%) practice the Hindu religion. The average life expectancy is 51.9 years. The HDI is 0.343 and with this Jajarkot is in the bottom 4, ranked 71 among the 75 districts of Nepal.

Table 1: Availability of health facilities in Jajarkot District

Health Facility	Quantity	Bed Capacity
District Hospital	1	15 beds
District Ayurvedic Health Centre	1	
Eye Care Centre	1	
Primary Health Care Centre (PHC)	1	5 beds
Health Post (HP)	8	
Sub Health Post (SHP)	25	
Doctors	4	

Politically and administratively, Nepal is divided into five development regions which are further divided into 14 zones and 75 districts. The public health as well as other development and services system in Nepal have divided the districts into 9 to 11 Ilakas as the sub administrative units depending on the number of VDCs and / or geographical setup. A Village Development Committee (VDC) is the basic political unit which consists of nine smaller units called wards. The ward is the smallest administrative unit that can be found with official recorded population and definite boundaries. There are a few villages or smaller settlements within a ward. Jajarkot district has two electoral constituency, 11 Ilakas, 30 VDCs and 270 wards.

A village development committee (VDC) area which always consists of nine smaller units called wards. The ward is the smallest administrative unit that can be found with official recorded population and definite boundaries. There are a few villages or smaller settlements within a ward.

Table 2: Political units of Jajarkot

Politically divided Region for voting	Ilaka Number	VDC Number	Name of VDC			
Electoral constituency one	1	2	Khalanga	Punma		
	2	2	Jagatipur	Bhor		
	3	3	Dhime	Paink	Dandagaoun	
	4	3	Sakla	Lah	Khagenkot	
	5	2	Ragda	Bhagawati		
	6	3	Ramodanad	Rokayagaoun	Nayakbad	
Electoral constituency two	7	3	Majkot	Kortang	Daha	
	8	3	Dashera	Salma	Suwanauli	
	9	3	Jungathapachaur	Sima	Thalaraikar	
	10	4	Garkhakot	Talegaoun	Archhani	Pajaru
	11	2	Karkigaoun	Jhapra		

CHAPTER 2

2 Aims and Objectives of this Study

2.1 General Objective

To evaluate the nutritional status of children aged 6 to 59 months in the context of Jajarkot district.

2.2 Specific Objective

a. To identify higher risk groups for malnutrition: gender, age, caste, wealth ranking.

b. To assess health seeking behaviour for sick persons in the visited households and the rationale for choices in health access.

c. To serve as a baseline nutritional survey for the Community Based Management of Acute Malnutrition (CMAM) pilot project for Nepal.

d. To make recommendations for nutritional interventions in regards to CMAM in Jajarkot District as a component of the overall pilot project for CMAM in Nepal.

e. To identify causal factors and their correlation with nutritional status.

3 Training

3.1 Overall Objective of the Training

The overall objective of the training was to train the health experienced persons on anthropometric measurement and general livelihood household questionnaire for the Jajarkot Nutrition survey.

There were six teams and each team consisted out of four members of different background (health assistant, health worker and female community health volunteer [FCHV], and the team leader with community health and sociology background). Two of the team members were assigned for anthropometric measurements and one for the household interview. One FCHV from the respective ward selected accompanied the teams. The FCHVs were briefed on sampling methodology by the survey team and details of anthropometric measurement.

The nutritional team members attended three days training conducted in SUDIN-NEPAL training Hall, Babarmahal, Kathmandu. The training sessions focused on anthropometric measurements and enabled each trainee to practice in the classroom and also in the field with community people. Attention was given on training on standardization of instruments and data recording. The anthropometric team members were also trained for completing the four health seeking behaviour questions and the interviewer was given specific training on the additional causal analysis questionnaire. The team leaders were specifically trained on quality assurance techniques. A practical classroom anthropometric measurement training session (standardization test) took place and the survey teams were able to measure at least three children each and compare their results with the measurements of a trainer expert. A detailed agenda of the three days training is attached as annex 1.

The training was led by the international nutritional consultant. For practical exercise as part of the training the participants went to Kathmandu municipality ward number 11, Tahapathali (Paurakhi Gaoun). Feedback on the measurements and the questionnaires was provided and outcomes discussed at the side. The team leaders went through one by one to all 45 questions of the questionnaire. As this questionnaire was already piloted in Bardiya during the nutrition survey carried out by Concern Worldwide in May 2008, only slight changes were made. After completing the training, all surveyors left for Jajarkot from Kathmandu. After reaching Salli Bazar on the way to Jajarkot, a meeting was held with local teachers, business man and health workers. All 30 clusters were identified (place, names and ways to specific clusters). After that the teams departed to their assigned destinations/clusters. All the teams were supervised by the international nutrition consultant having all the measuring equipment, the additional household questionnaires and logistics support.

4 Research Design and Methodology

4.1 Research Method

The survey used a quantitative research methodology.

4.2 Study Variables

The variables of the study were height, weight, MUAC, oedema, age, sex, health seeking behaviours and rationales, food consumption, demographics and composition of household, feeding practices, health and nutrition practices, food insecurity questions.

4.3 Type of Study

The type of study was an anthropometric nutrition survey with causal analysis.

4.4 Target Population

For the anthropometric measurements the households of the targeted children were randomly selected and aged 6 months to 59 months in Jajarkot district. The household questionnaire was completed in every third household selected for the anthropometric measurements.

4.5 Sampling Methods and Sample Size

A random cluster sampling of the entire district was taken. A two stage cluster sampling methodology was used. The sample used was 30 clusters. Wards were the primary sampling unit.
The sample size was 30 clusters × 30 children (6 to 59 months) for anthropometric measurements. Every third household randomly selected with a child 6 to 59 months included in the anthropometric measurements was included for the household questionnaire. The total children in Jajarkot district below 5 years are 24,369. According to NDHS 2006 the prevalence of wasting of Mid Western Region is 11.6 %. The desired precision is 3 % and desired effect is 2.9. Hence the sample size of the children for anthropometric analysis is 919. Additional two children were included from each cluster. For causal analysis, the total sample size of households was 312. However, the sample size was reduced to 294 after cleaning the datasets. Only the first child recorded on the anthropometric form was included for the causal analysis, children listed second or third were excluded due to statistical insignificancy.

4.6 Tools and Techniques for Data Collection

The tools used for data collection were MUAC tapes, Salter hanging scales, height boards and questionnaires for verbal collection of information from the household head. The following data

was collected for children 6 to 59 months of age:

Age: Age was recorded by birth date (mm/dd/yyyy) according to the Nepali calendar. This birth date was confirmed by vaccination card, birth certificate or other form of identification. If it was confirmed then a "Y" was marked on the anthropometric form in the appropriate column. If the age could not be verified, then the dates of birth or age in months were recorded as stated by caretaker and an "N" was marked on the anthropometric form in the column for confirmation of date of birth.

The team leader calculated the age in months of the child before performing the anthropometric measurements. If the age could not be confirmed and the mother was unclear of the age of the child, the team leader included all children with a height of 60 cm – 110 cm. This was a last resort for inclusion or exclusion to the survey.

Sex: Sex of the child was recorded as "M" for male and "F" for female.

Weight: The weight was measured using 25 kg hanging Salter scales and recorded in kilograms to the nearest 100 grams. The Salter scale was calibrated each morning by the team leader using a known weight of 2 kg. The scale was hung from a stick held by two measurers, and recalibrated to zero with the hanging pants attached to the scale before the child was put into the weighing pants. The teams weighed all children with light clothes due to winter and the average weight of the clothes came out to be 150 gram which then was deducted from the original weight of the child.

Height: Height measured in centimetres using a 1.30 meter height board graduated to 0.1cm with a movable block. Children were measured recumbent if their height was below 85cm. The children were measured standing if they measure 85 cm or above. The height was recorded to the nearest 0.1 cm. All children were measured barefoot, and without caps or hairdo. For children measured standing up, the measurers were trained to ensure that the child's head, shoulder blades, buttocks, calves and heels were touching the boards and they were looking straight ahead. Children measured lying down were placed in the middle of the board with the head touching the fixed end, the knees pressed down and the heels touching the movable block.

Oedema: Oedema was measured by applying normal thumb pressure to the anterior surface of both feet for three seconds. If an indentation remained after the pressure was removed, presence of oedema was considered positive and a "Y" entered on the data collection form. If the thumb imprint did not persist, or if the oedema was not bilateral, the child was recorded as not having oedema and an "N" entered on the data collection form. The supervisor checked all positive cases of oedema.

Mid upper arm circumference (MUAC): MUAC was measured in centimetres, to the nearest 0.1cm, using standard UNICEF MUAC measuring tapes. The measurers were trained to locate the mid-point between the shoulder and the tip of the elbow on the left arm with the arm bent at a right angle and to note the mid-point. The measurement was taken at this mid-point with the arm extended and relaxed.

For malnutrition cases found: Each child that was found with severe acute malnutrition (< 110 mm MUAC and/or oedema) was referred to the closest health facility or to the FCHV.

Healthcare Seeking Behaviour Questions: Four questions regarding diseases in the past two weeks, related healthcare seeking behaviour was assessed. These questions were either yes or no questions or coded for responses. If the respondent did not want to answer then the space was not left blank but instead a "0" was placed in the space indicating "does not know/no response".

Optional detailed health/ food/ nutrition questionnaire: An additional health/ food security/ nutrition questionnaire was used for every third household selected with children eligible for anthropometric measurements.
The person who collected this data was not part of the nutritional survey team. A single person conducted the interview and followed behind the nutritional survey team. He/she conducted interviews after the nutritional team finished in order not to interfere with the quality of the data collected by the nutritional survey team. If the head of household was not present, then any person within the household over the age of 16 was asked the questionnaire.

4.7 Pre-testing the Data Collection Tools

A practice survey day took place in an area outside of the chosen clusters after the theoretical and practical training sessions were completed. The teams were supervised by the trainers during the test day and data collection forms were modified after this practice survey day for proper understanding and acceptance among the surveyed population.

4.8 Validity and Reliability of the Research

This study was using a standard SMART methodology for studying nutrition and identifying severe acute malnutrition. As such these methods are well tested for validity and reliability of results. The sample size was calculated using ENA software so as to ensure that there was a sufficiently large sample for reliable results.

4.9 Limitation of the Study

This study is focused on a baseline pilot study for CMAM projects. The variables in particular are generated with the nature of the project.
Due to cold weather, the children were not completely undressed when taking the weight measurement and therefore weighed with under garment weighing 150 grams on average.

4.10 Plans for Supervision and Monitoring

Each nutritional survey team had a team leader who was constantly supervising in the field. The team leaders were responsible to check the quality and legibility of the data collection sheets before leaving the cluster area each day.
Each day a debriefing session was conducted between the nutritional survey manager and/or

the assistant nutritional survey manager and the team leaders and all data collected that day was reviewed for errors and necessary clarifications made immediately.
Concurrent crosschecks of the data collected by the teams were performed by the managers in 5% of the sampled households (e.g. supervisors choose households with data already collected and then retook measurements of children while comparing it with the data collected by the teams at a previous time).

4.11 Plans for Data Management

Nutritional survey teams returned data collection forms of one cluster per day at the end of the day during debriefing sessions with the nutrition supervisor. Data entry into the ENA database and EPI Info were done from these data collection forms by one supervisor only.

4.12 Plans for Data Analysis

The data was analyzed using EPI Info and ENA software. For certain analyses on correlations between household dietary diversity or food insecurity and anthropometric indicators, a STATA computer statistical program version 8 was used.

4.13 Classification of Malnutrition

Acute Malnutrition:
The main indicator of nutritional status used in this survey was wasting or acute malnutrition, which assesses how thin the sample population was relative to their height, compared with a reference population.

Weight-for-height (W/H) was expressed either in Z-score or percent of the median (% median). The Z-score index is usually used to measure prevalence of malnutrition at population level, while percent of the median was used to assess the nutrition status of the individuals. The classification of GAM (Global Acute Malnutrition), MAM (Moderate Acute Malnutrition) and SAM (Severe Acute Malnutrition) using Z-score and percent of the median were as follows:

Table 3: Classification of the nutritional status using Z-Score and % Median

Particularise	% of the Median	Z- Scores
Global Acute Malnutrition	< 80 % and /or oedema	< - 2 and / or oedema
Moderate Acute Malnutrition	≥70% to < 80 %, no oedema	≥ -3 to < - 2, no oedema
Severe Acute Malnutrition	<70% and/or oedema	<-3 Z-score and/or oedema

All figures for acute malnutrition were analyzed and reported using WHO 2006 standard and NCHS (National Centre for Health Services) reference values.
The weight for height index is the most appropriate index to quantify wasting in a population in situations where acute forms of malnutrition are the predominant pattern. However the MUAC is a useful tool for rapid screening of children at a higher risk of mortality. MUAC is used as the

primary screening tool and admission criteria for the CMAM program. MUAC measurements were presented for all children from 6 to 59 months. Classification of the Nutritional Status using MUAC:

Adequate nutritional status	MUAC ≥ 13.5 cm
Risk of malnutrition	MUAC 12.5 – 13.4 cm
Moderate acute malnutrition	MUAC ≥ 11.0 - <12.5 cm
Severe acute malnutrition	MUAC <11.0 cm

Chronic Malnutrition:
Children who had a low height-for-age (H/A) were considered stunted. Measuring the height of a child in relation to a standard child of the same age gives an indication of the growth of a child. H/A was used as an indicator for chronic malnutrition and was analyzed from data collected in this survey.

Food insecurity:
Food security is a major determinant of malnutrition; however the relationship between anthropometric indicators of malnutrition (described above) and indicators of food insecurity were not well described. The Jajarkot nutrition survey included:

1. Household Dietary Diversity Score (HDDS) which counts food groups consumed by households in the preceding 24 hours;
2. Individual Dietary Diversity Score (IDDS) which counts food groups consumed by children under five years of age in the household in the preceding 24 hours;
3. Months of Insufficient Household Food Provisioning (MIHFP) which records which months of the year families face food shortages.

4.14 Expected Outcome of the Survey

Outcomes of the research included statistical information regarding the rate of moderate and severe acute malnutrition in Jajarkot District, potential underlying factors of malnutrition and recommendations for addressing severe acute malnutrition in the community.

4.15 Plans for Dissemination of Survey Results

Results will be disseminated to the concerned authorities (NGOs, INGOs and MOHP) after discussion with Concern Worldwide, Nepal.

4.16 Plans for Utilization of the Survey Findings

The results will be used to plan a possible CMAM pilot program in Jajarkot District. They are also used to assess the overall nutritional situation in Jajarkot and to respond to a food crisis if detected.

4.17 Work Plan

See Annex – 7.

5 Results

The data was collected from 15th of December 2008 to 5th of January 2009. The total number of households visited for the anthropometric measurement was 960, and 13 data sets were excluded due to errant data and thus became 947 children. Every third household (out of the selected 30 in each cluster) was selected for filling the household questionnaire. Thus 30 cluster × 10 = 300 households plus two households extra from each team (6 teams × 2) = 12. After removing 18 errant data sets, 294 completed questionnaires were included for the causal analysis.

5.1 Anthropometric results

5.1.1 Age and sex distribution of the sample population

Out of 947 children aged 6-59 months, there were 46.7% of female children (n=442) and 53.3% of male children (n=505). The overall sex ratio of boys/girls in Jajarkot was 1.1 indicating a well balanced situation. However, in the age group 54-59 months girls represent only 31.6% of the children included in the survey in comparison to 68.4% of boys (boys: girls ratio 2.2).

Table 4: Distribution of age and sex of the children 6- 59 months in the sample

Months	Boys		Girls		Total		Ratio
	#	%	#	%	#	%	Boy: Girl
6-17 months	150	55.8	119	44.2	269	28.4	1.3
18-29 months	136	49.1	141	50.9	277	29.3	1.0
30-41 months	115	53.7	99	46.3	214	22.6	1.2
42-53 months	65	50.0	65	50.0	130	13.7	1.0
54-59 months	39	68.4	18	31.6	57	6.0	2.2
Total	505	53.3	442	46.7	947	100.0	1.1

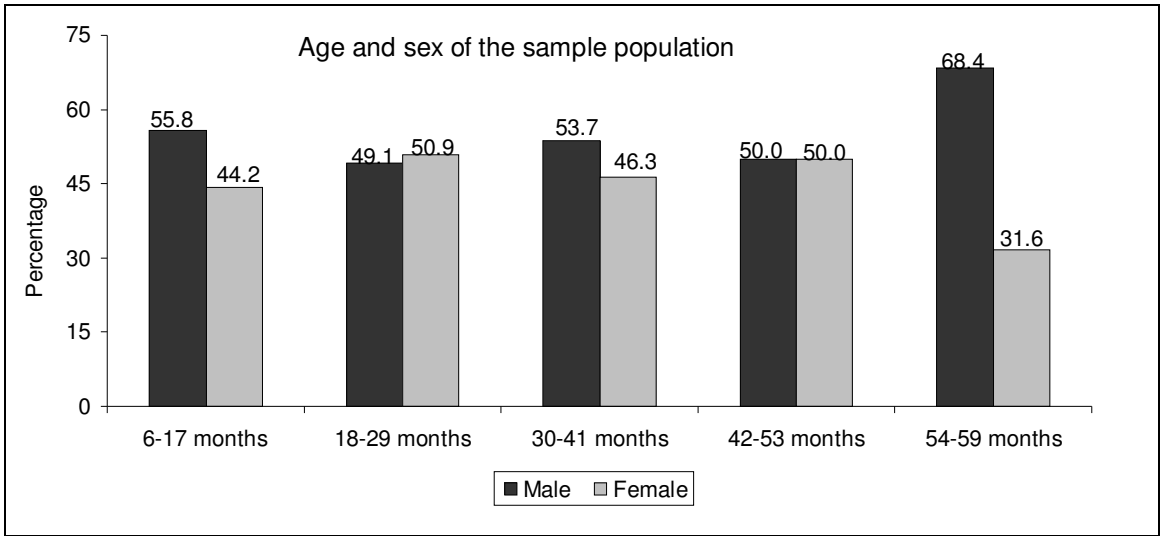

Figure 2: Age and sex distribution of the sample population

5.1.2 Anthropometric analysis: Global Acute Malnutrition (Wasting) WHO standard, Z-score

The mean weight for height of children (6-59 months) in Jajarkot was 78.94 cm ± 8.99, and 9.7 kg ± 2.2 respectively.

Table 5: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex (WHO)

	All n = 947	**Boys n = 505**	**Girls n = 442**
	(95%CI)	(95%CI)	(95%CI)
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(97) **10.5 %** (7.9 - 12.8)	(50) **10.0 %** (7.3 - 12.7)	(47) **10.7 %** (7.0 - 14.5)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(76) **8.1 %** (6.3 - 9.9)	(40) **8.0 %** (5.9 - 10.1)	(36) **8.2 %** (5.3 - 11.1)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(23) **2.4 %** (0.7 - 3.8)	(10) **2.0 %** (0.3 - 3.7)	(11) **2.5 %** (0.2 - 4.8)

Children with a weight-for-height below -2SD from the median of the reference population are too thin for their height, or wasted, while those with a weight-for-height below -3SD are severely wasted.

Table 6: Prevalence of wasting (WHO and NCHS), Z-score

		WHO Standard 2005	NCHS Reference 1977
Global Acute Malnutrition (GAM)	95% CI	10.5 % (7.9 - 12.8)	9.1 % (6.7 - 11.4)
Severe Acute Malnutrition (SAM)	95% CI	2.4% (0.7 - 3.8)	2.0 % (0.5 - 3.5)

The overall prevalence of wasting (GAM, <-2 Z score) of Jajarkot was found 10.5 % (table 6) using WHO standard and 9.1 % using NCHS reference. There was no significant difference found in the percentage of GAM and MAM between male and female children. The overall prevalence of SAM was found 2.4 % with more (but not significantly) girls than boys. The highest prevalence (4.5 %) of SAM was found among the age group 6-17 months whereas the lowest prevalence (0%) was found in the age group 54–59 months.

Table 7: Prevalence of acute malnutrition by age based on weight-for-height z-scores and/or oedema (WHO)

Age in Months	SAM (<-3 z-score)		MAM (>=-3 and <-2 z-score)		GAM (<-2 z-score)		Normal (>=-2 z-score)		Total	
	#	%	#	%	#	%	#	%	#	%
6-17	12	4.5	38	14.2	50	18.7	218	81.3	268	100
18-29	5	1.8	22	8.0	27	9.9	247	90.1	274	100
30-41	4	1.9	7	3.3	11	5.2	202	94.8	213	100
42-53	2	1.6	7	5.4	9	7.0	120	93.0	129	100
54-59	0	0.0	2	3.6	2	3.6	54	96.4	56	100
Total	23	2.4	76	8.1	99	10.5	841	89.5	940	100

Among 940 children in total 99 children were found global acutely malnourished (10.5%) with the lowest prevalence (3.6%) among the age group 54-59 months and the highest prevalence (18.7%) in the age group 6-17 months.
Seven oedema cases were found during the survey exercise but had to be taken out of the analysis during the data cleaning process.

Table 8: Distribution of acute malnutrition and oedema based on weight-for-height z-scores, WHO

Oedema	<-3 z-score	>=-3 z-score
Present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Absent	Marasmic No. 23 (2.4 %)	Normal No. 924 (97.6 %)

5.1.3 Anthropometric analysis: Stunting and Underweight

Out of 947 children assessed only for 80 (8.5%) children the date of birth was confirmed through an immunization card and/or birth registration paper. The age of the majority 867 children was not confirmed and recorded according to care takers answers only. When analysing the data it became clear that there is a problem with the quality of age data provided. Therefore indicators requiring age such as weight for age (underweight) and height for age (stunting) were excluded from the survey entirely.

5.1.4 Anthropometric analysis: Mid-Upper Arm Circumference (MUAC)

The MUAC is a useful tool for rapidly identifying children at a higher risk of mortality at the community level. According to new international guidelines and recommendations MUAC was taken for children of 6 month to below five years.

Table 9: Nutritional Status according to MUAC (n=947)

Nutritional Status	MUAC (mm)	# Children (6-59 months)	%
Severe Acute Malnutrition	<110	9	1.0
Moderate Acute Malnutrition	>=110 to <125	131	13.8
Risk of Malnutrition	>=125 to <135	313	33.0
Normal	>=135	494	52.2
Total		947	100

Out of 947 children aged 6–59 months 1% are severely malnourished associated with a higher risk of mortality and 13.8% are moderately malnourished. Using MUAC one third of the 6-59 months old children are at risk of becoming malnourished.

5.2 Results of health seeking behavior questionnaire

Table 10: Proportion and number of children receiving medical treatment during illness in two weeks preceding the interview

	# Children	%
Child was sick and did seek medical treatment	112	54.4
Child was sick and did not seek medical treatment	94	45.6
Total children sick in the last 2 weeks	206	100

Out of 947 children 206 (21.8 %) were reported to be sick during the last two weeks. Only a bit more than half of these children were brought for medical treatment by their care takers.

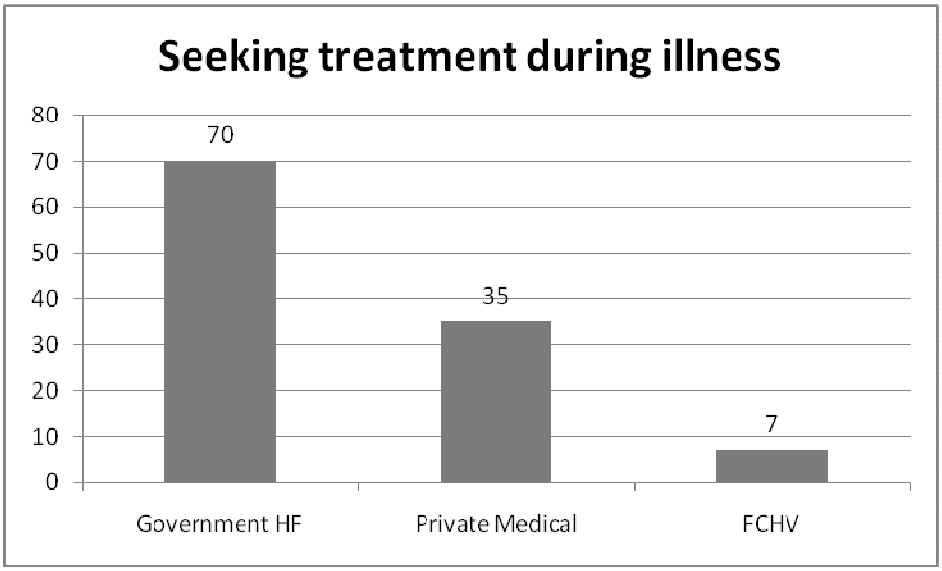

Figure 3: Medical facility used during last illness

The above figure shows that among the 112 children which were brought for medical treatment 62.5% (n = 70) were seen at a government health facility whereby 31.3% (n=35) were treated by the private sector and 6.3% (n = 7) went for treatment to the FCHVs.

Table 11: Reason for not accessing a government health facility (HF)

Reason for not accessing a Government HF	# of Respondents	%
No answer	55	57.3
HF is very far	15	15.6
Medicine given by HF is not effective	10	10.4
HF staff not available during office time	1	1
Service in HF not good	6	6.3
Home visit from private medical person	5	5.2
Medicine not available in HF	4	4.2
Total	96	100

Table 11 shows that the majority of care takers did not answer the question investigating reasons for not accessing a government health facility. For many mothers the health facility is very far from their village. There is the common believe that services provided are not of good quality or not effective and that necessary drugs are not available. For a few care takers private medical providers are another option when seeking medical treatment.

5.3 Household information

Household information was collected from the head of household. In case of absence the questionnaire was answered by another available member of the household.

Table 12: Distribution of head of household

Head of Household	# of Respondents	%
Father	216	69.2
Mother	8	2.6
Grandmother	18	5.8
Grandfather	67	21.4
Other	3	1.0
Total	**312**	**100**

The majority of households interviewed for the household questionnaire are headed by the father followed by households headed by the grandfather. The minority (8%) of households are female headed.

Table 13: Number of members in surveyed households

Household size	# of Households	%
Two	5	1.6
Three	28	9.0
Four	52	16.7
Five	51	16.4
Six	46	14.7
Seven	46	14.7
Eight	35	11.2
Nine	17	5.5
Ten	11	3.5
> Ten	21	6.7
Total	**312**	**100**

The majority of surveyed households have four to eight family members.

Table 14: Number of under 5 children in the family

Number children <5 in the family	# of Households	%
One	180	57.7
Two	118	37.8
Three	11	3.5
Four	3	1.0
Total	**312**	**100**

The above table shows that the majority of surveyed households had one or two children less than five years of age.

Table 15: Educational status of mother and father

Educational status		# of Respondents	%
Mother	Illiterate	218	69.9
	Literate	94	30.1
Father	Illiterate	98	31.4
	Literate	214	68.6

Table 15 indicates the educational status of mothers and fathers. Mothers and fathers who can read and write irrespective of years of schooling were taken as literate. Majority of mothers (69.9%) were illiterate while above two third of fathers (68.6%) were literate.

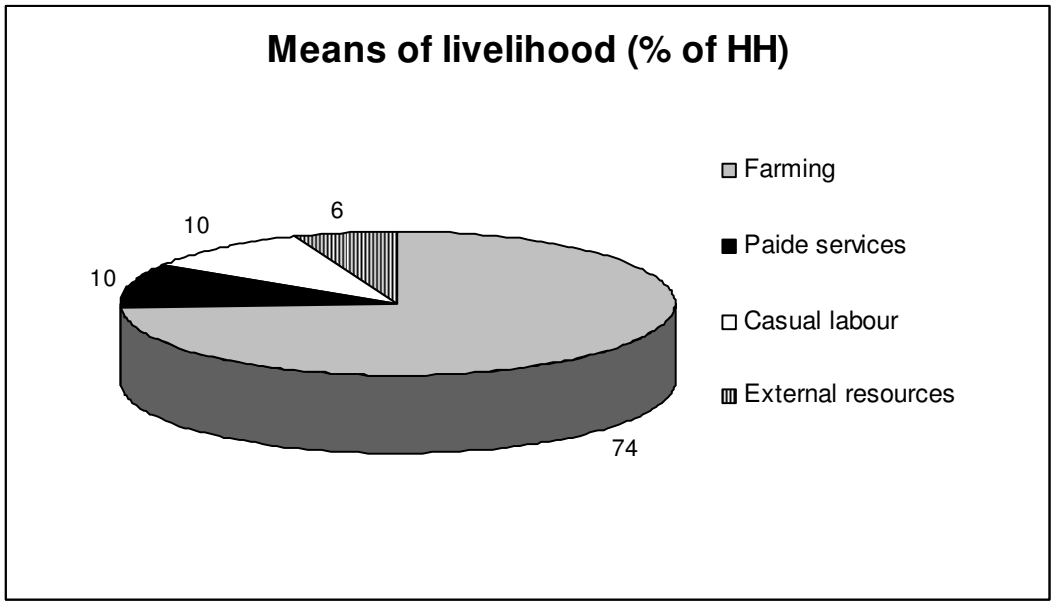

Figure 4: Means of livelihood of the household

Figure 4 shows that for the majority of households (74%) the means of livelihood was agriculture (crop farming, livestock or fishing) followed by paid services (own business or salaried job) and casual labour (10% each), and external sources (6%) such as remittances and pensions.

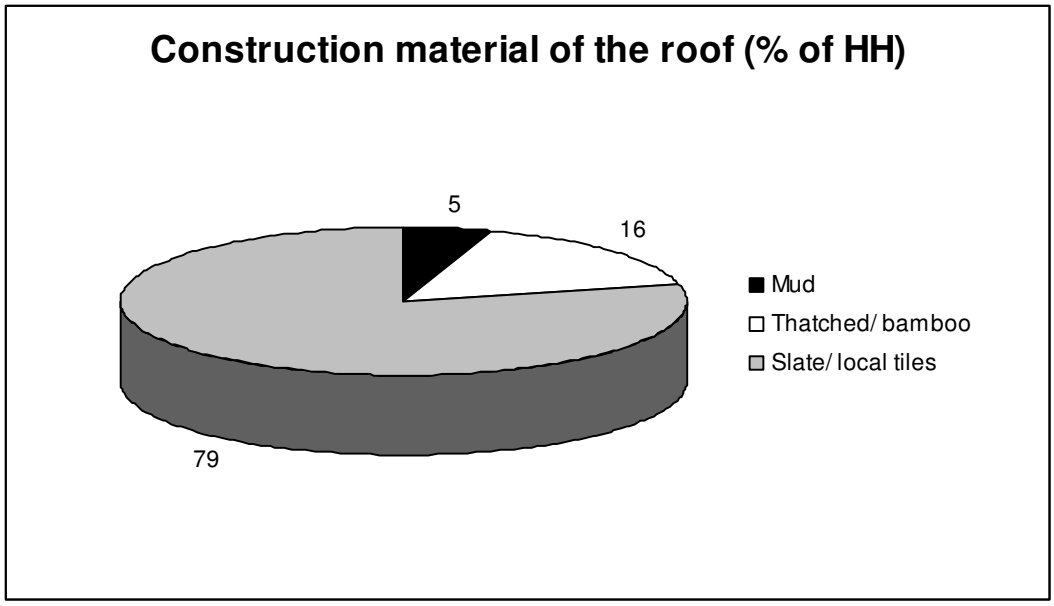

Figure 5: Construction material of the roof

Construction material used for the roof, floor and the walls of the house was used as a proxy indicator for the household's wealth. The assumption is that poor households use local materials for all three but that the roof material is the first to be replaced by a more durable alternative in case the economic situation of the family is improving.

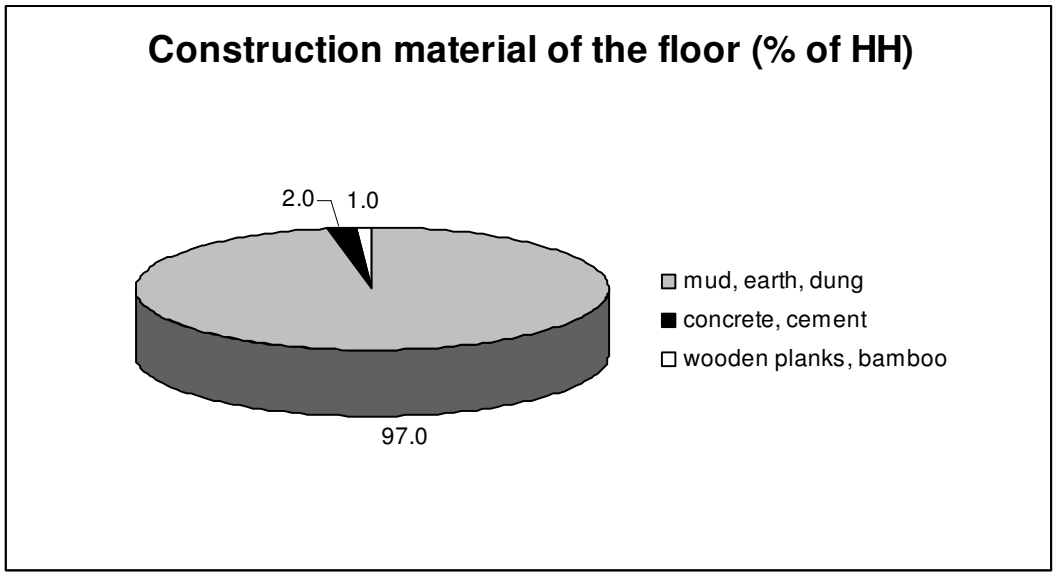

Figure 6: Construction material of the floor

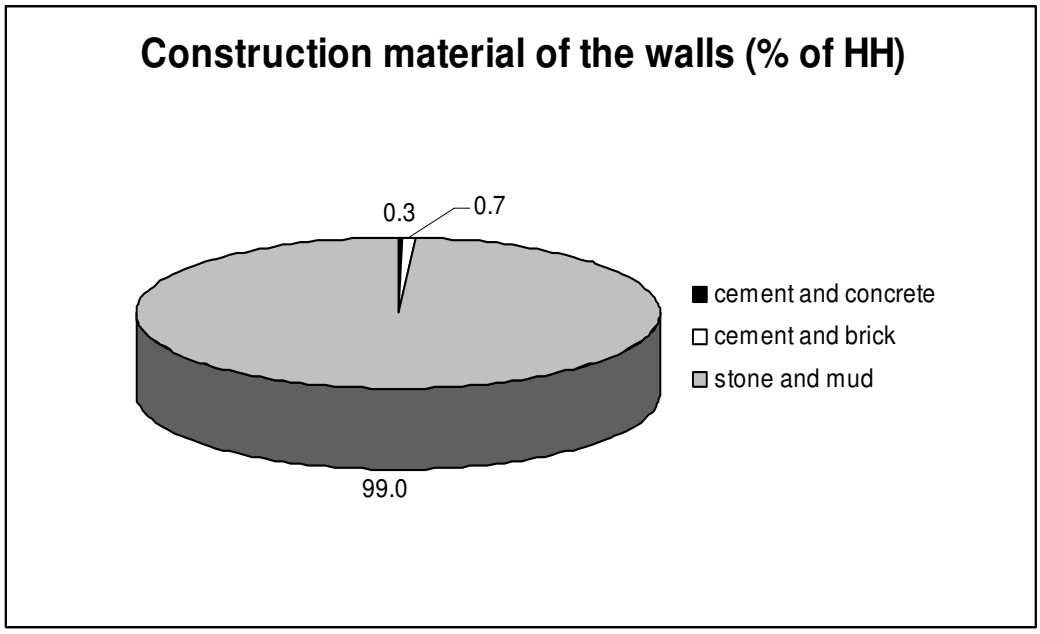

Figure 7: Construction material of the walls

The above figures illustrate results verifying the assumption with nearly all households using local construction materials for the floor. Three quarter of the households replaced local roof construction materials with more costly but longer lasting solutions. The remaining one quarter using local materials even for the roof can therefore be considered as very poor.

Ownership of agricultural land and livestock was assessed as a second indicator for the economic status of the surveyed households. Around one quarter of the interviewed households did not own agricultural land. Out of the group owning land more than half (57%) of the households owned one to six ropani only (approximately 20 ropani is equal to 1 ha). 80% of the surveyed households owned 1 ha or less of land (<=20 ropani).

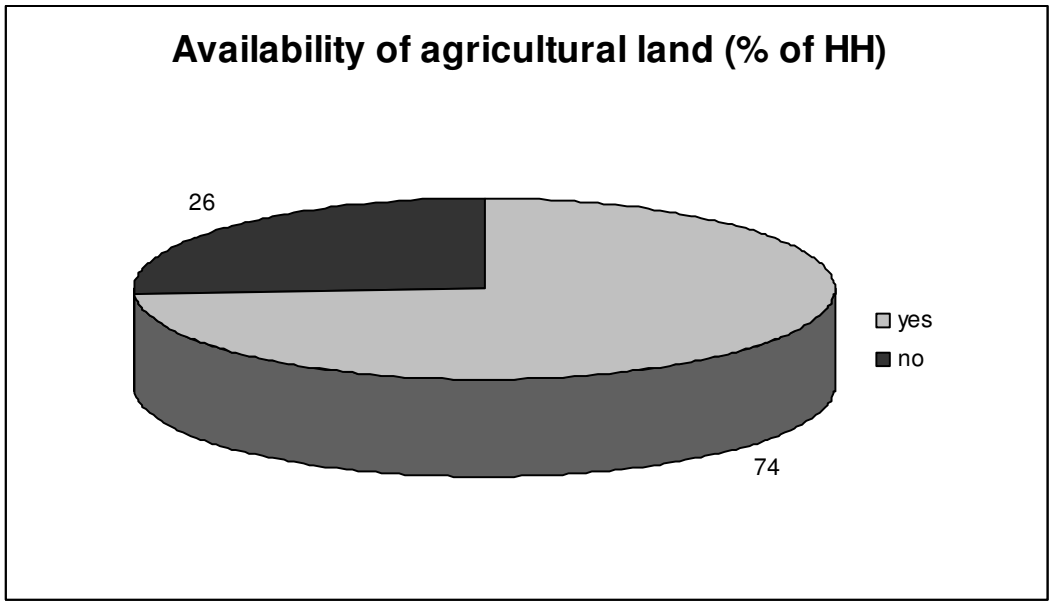

Figure 8: Availaibility of agricultural land

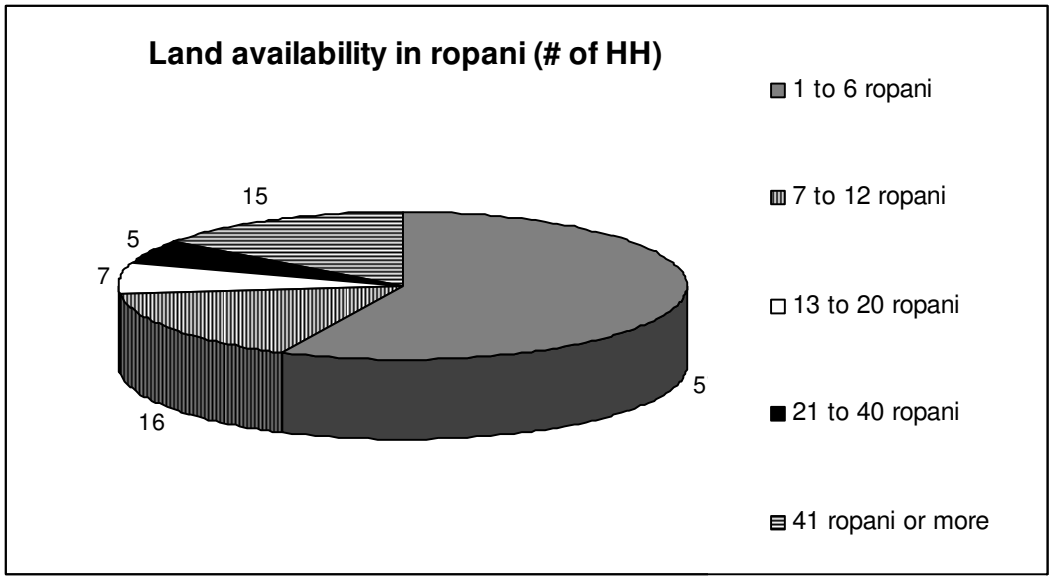

Figure 9: Land availability in ropani (n=232)

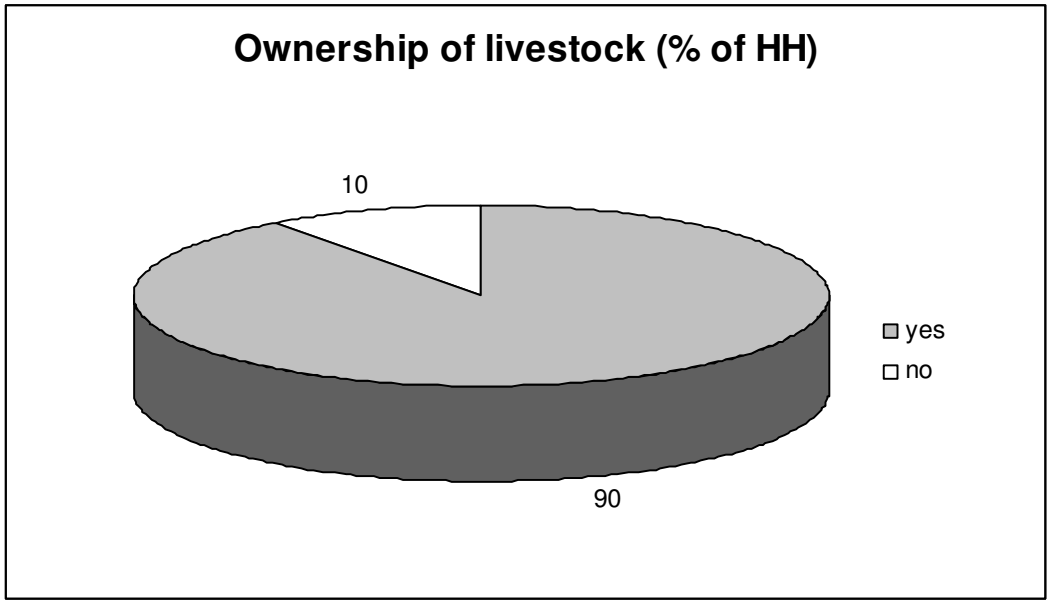

Figure 10: Ownership of livestock (herds, farm animals or poultry)

Livestock (farm animals and or poultry) was owned by the majority of households. However 10% of families did not have any livestock.

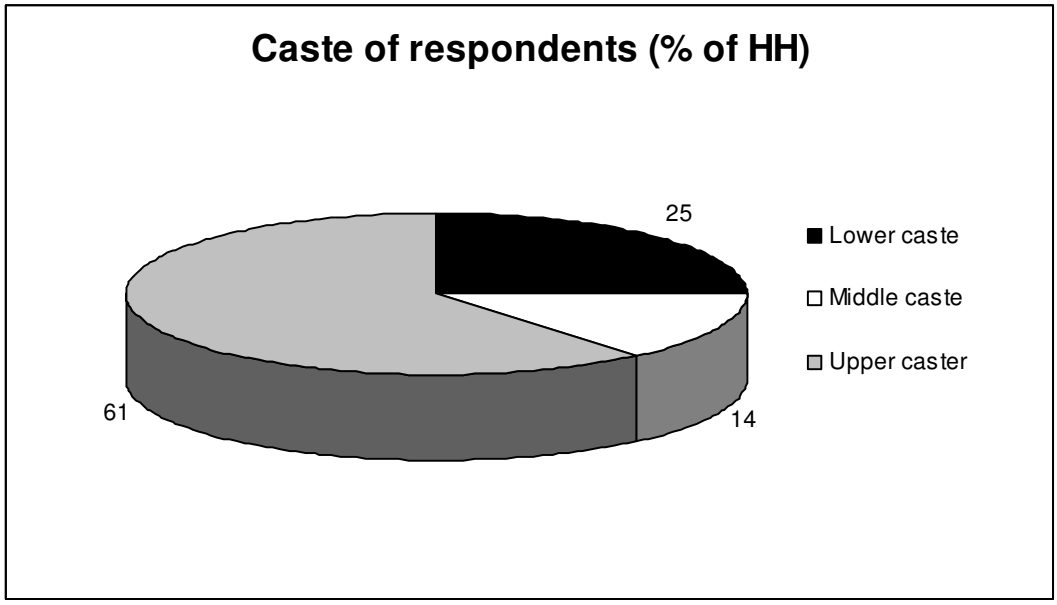

Figure 11: Caste/ ethnicity distribution of the respondents

One quarter of the surveyed households belong to the group of the lower caste whereby the majority of respondents are members of the upper caste.

5.4 Water and Sanitation

This chapter covers water and sanitaton related issues: source of drinking water, hand washing practices and material used for hand washing.

Table 16: Source of drinking water during monsoon and dry season

Source of Water	During Monsoon		During dry Season	
	# of Respondents	%	# of Respondents	%
Public tap	198	63.46	197	63.1
Private tap	2	0.64	2	0.6
Protected dug well/ spring	24	7.69	28	9.0
Unproptected well	34	10.90	32	10.3
Pond/ lake/ river/ stream	54	17.31	53	17.0
Total	312	100	312	100

Majority of households (about 63%) get their drinking water from a public tap, only a few households own private taps (<1%), about 8% collect their water from a protected dug well or spring and about 17% get the water from a pond, lake, river or stream.Table 16 above shows that there is no differences in the source of water source during the monsoon and the dry season.

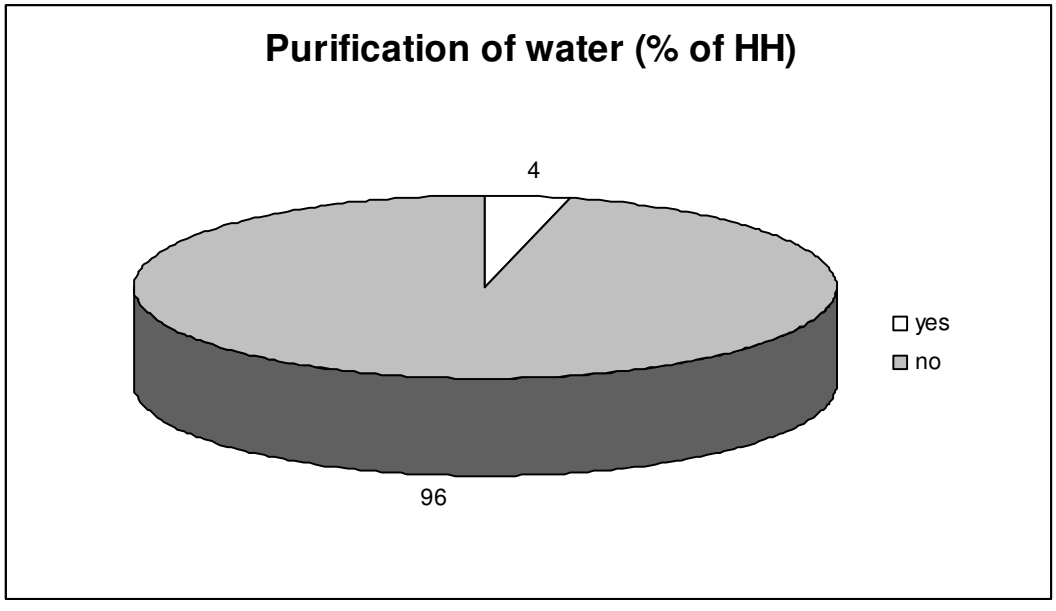

Figure 12: Proportion of households making water safer to drink before consumption

Figure 12 shows that only 4% (n=11) of households use any form of water purification method before consumption. Among the 11 households, 1 household uses cloth to filter the water, 7 households let the water settle down and only 3 households boil the water before drinking.

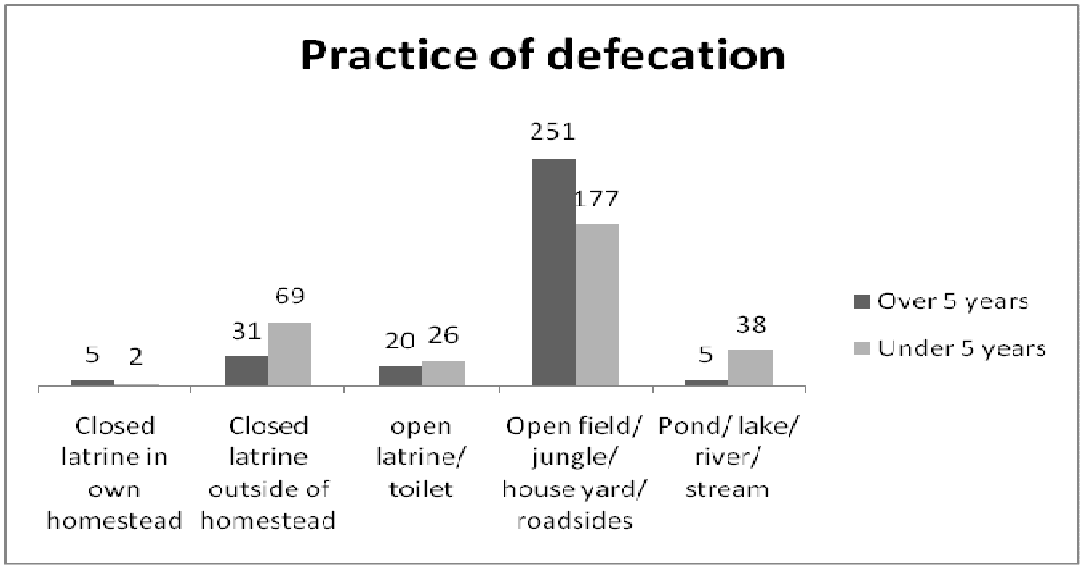

Figure 13: Defecation habit

Regarding defecation practices, majority of respondents stated that family members practice open defecation (field/ jungle/ house yard/ roadsides): family members over 5 years 80.5% (n=251) and under 5 years 56.7% (n=177). There is a minority of family members (over and under five years) using a closed latrine in the own homestead.

Table 17: Hand washing practices (multiple answers possible)

Occasions	%
Before Cooking	71.7
Before eating/feeding a child	53.0
After-Latrine	94.0
After attending child-defecation	82.7
Before-Breastfeeding	5.7

Regarding handwashing practices, the vast majority of respondents replied washing hands before cooking (71.7%), after using the latrine (94.0%) and after attending the child defecating (82.7%). Handwashing before eating/feeding a child (53.0%) and before brestfeeding (5.7%) is less common.

For hand washing the majority of respondents use plain water (50.3%) or soap/oil cake (30.8%). A smaller group uses ash (18.3%) or mud (0.6%) to wash hands.

5.5 Household food and nutrition situation

In a next step households included for the causal analysis exercise were asked about their food consumption patterns. Out of the 312 households asked which food groups they had consumed during the 24 hours prior to the survey nearly all (99%) consumed cereals. Any form of vegetables, pulses and fat products were consumed by at least half of the respondents, milk products were less common (42%) but still among the more frequent consumed food groups. All the other food groups were consumed by less than 15% of the interviewed households including fruits, meat and eggs.

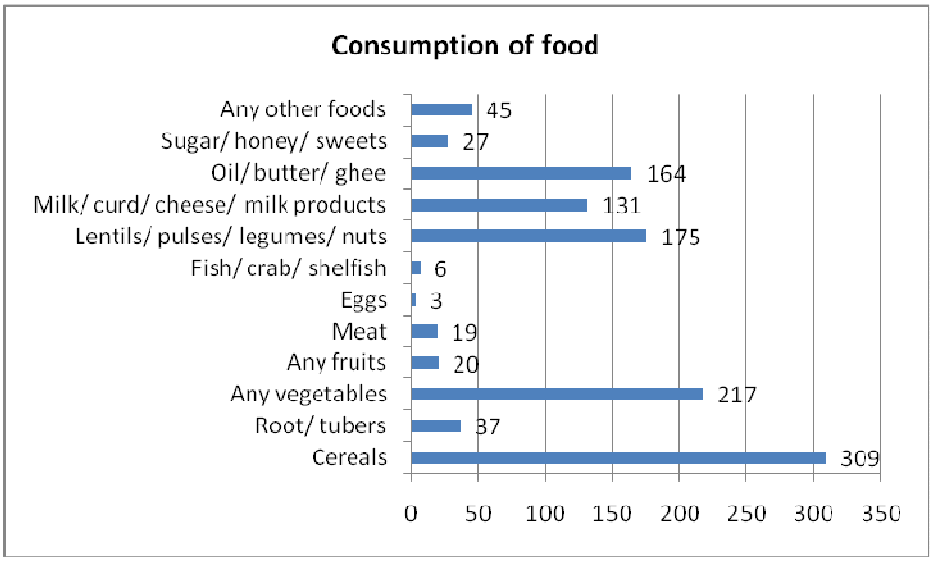

Figure 14: Household food diversity in last 24 hour

When asked for their meal frequency the majority of households (n=262) indicated to eat two main meals a day, followed by 29 households with three meals and 21 households eating only one meal a day.

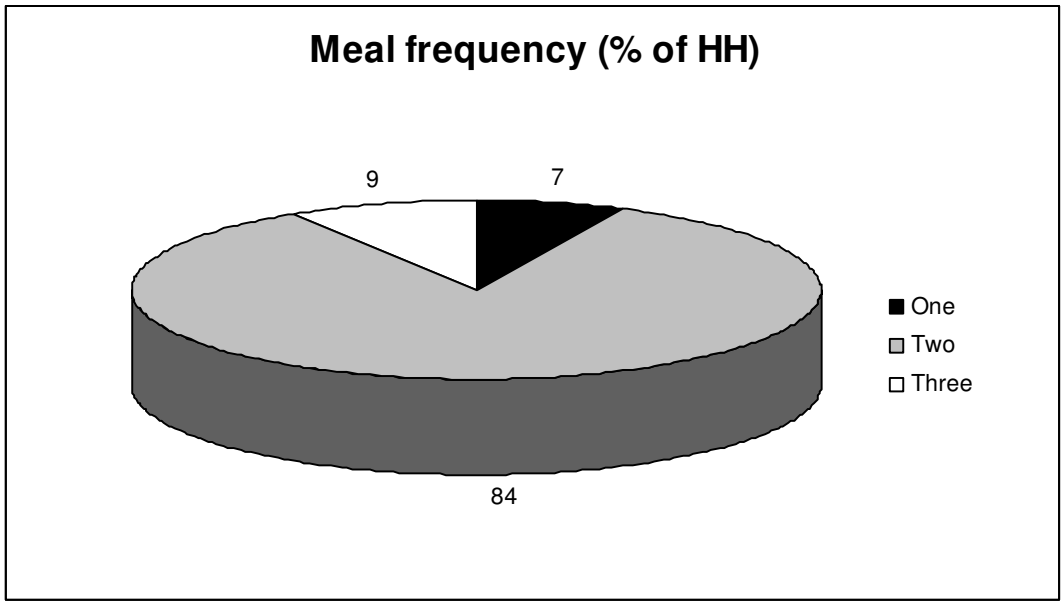

Figure 15: Frequency of meals eaten in the household

Regarding eating snacks, 251 households usually eat one snack during the day, 8 households indicated to have two daily snacks and 53 households do not eat any snacks during the day.

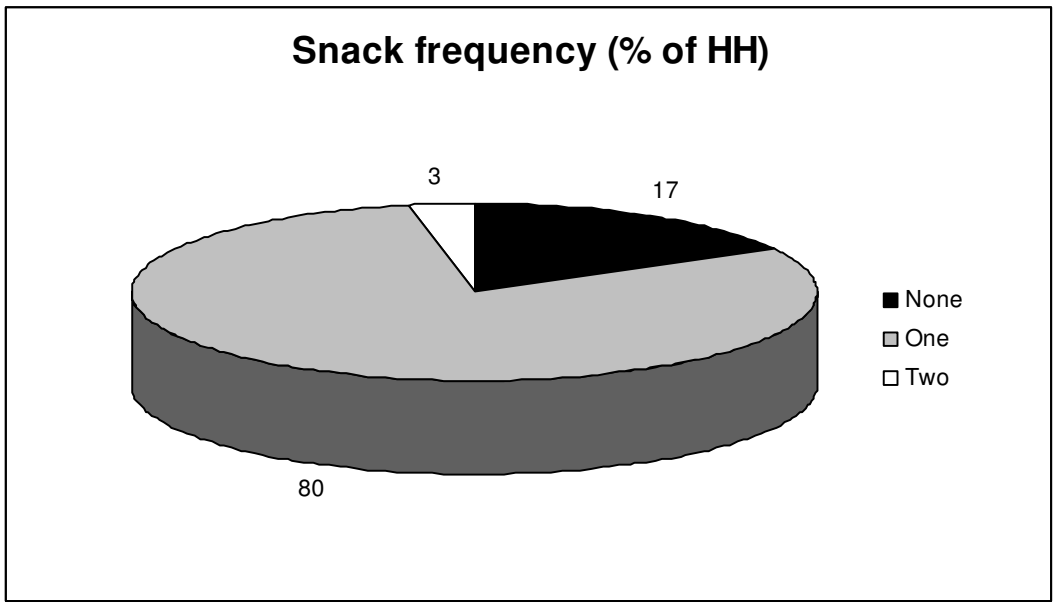

Figure 16: Frequency of eating snacks

Nearly three quarter of the households reported to have expereinced any form of food shortage in the past twelve months.

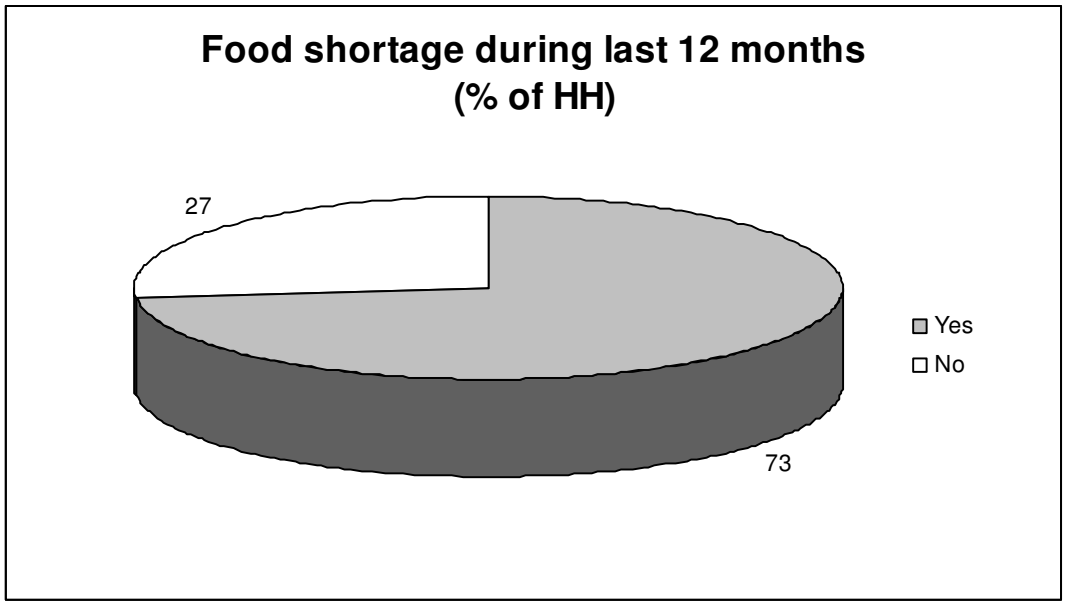

Figure 17: Food shortage experienced in the past 12 months

Households which had experienced any food shortage in the past twelve months were than asked for the time in the year where a shortage was experienced and its causes. Figure 18 and table 18 show that the months February to April and July to August were particularly months of food shortages mainly caused by depleted food stocks. Lack of labour opportunities/ income and remittances were in general of less importance as a cause for a food shortage of the interviewed households.

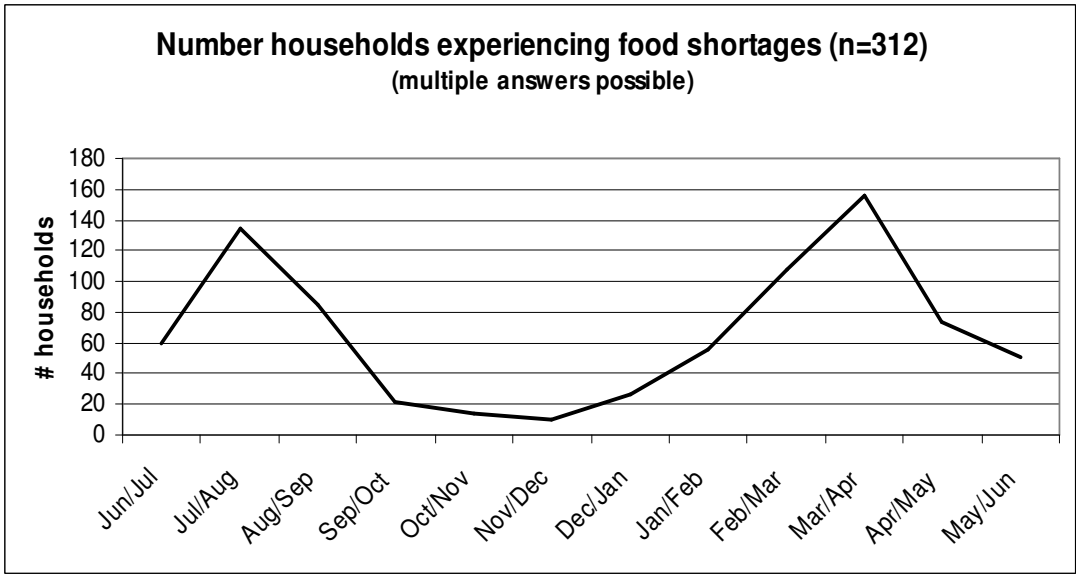

Figure 18: Time and number of households experiencing food shortage

Table 18: Reasons for food shortages

Months	Own production/ food stock depleted	Lack of labour opportunities/ lack of income	Remittance did not come	Other	Total
Jun – July	57	1	0	2	60
July – Aug	126	2	1	5	134
Aug – Sep	78	1	1	5	85
Sep – Oct	21	0	0	1	22
Oct – Nov	13	0	0	1	14
Nov – Dec	8	1	0	1	10
Dec – Jan	25	0	0	1	26
Jan – Feb	52	1	0	3	56
Feb – Mar	100	3	0	5	108
Mar – Apr	142	5	0	9	156
Apr – May	67	2	0	5	74
May - Jun	45	2	0	4	51

5.6 Child health and nutrition

For assessing the child's health and nutrition only the first recorded child of the 312 households was included in the interview. Out of the 312 children included in the assessment 147 were still breastfed at the time of the interview.

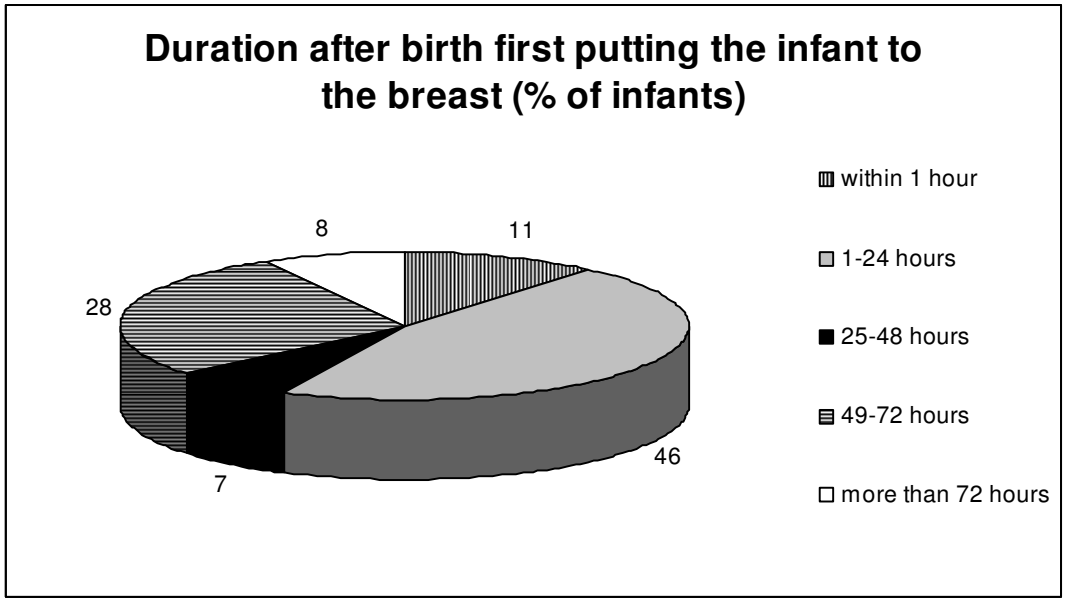

Figure 19: Duration after birth first putting the infant to the breast (n=289)

Only 11% of the infants were put to the mother's breast within one hour after birth. Fourty three percent of the infants had to wait more than 24 hours before being put to the breast first time.

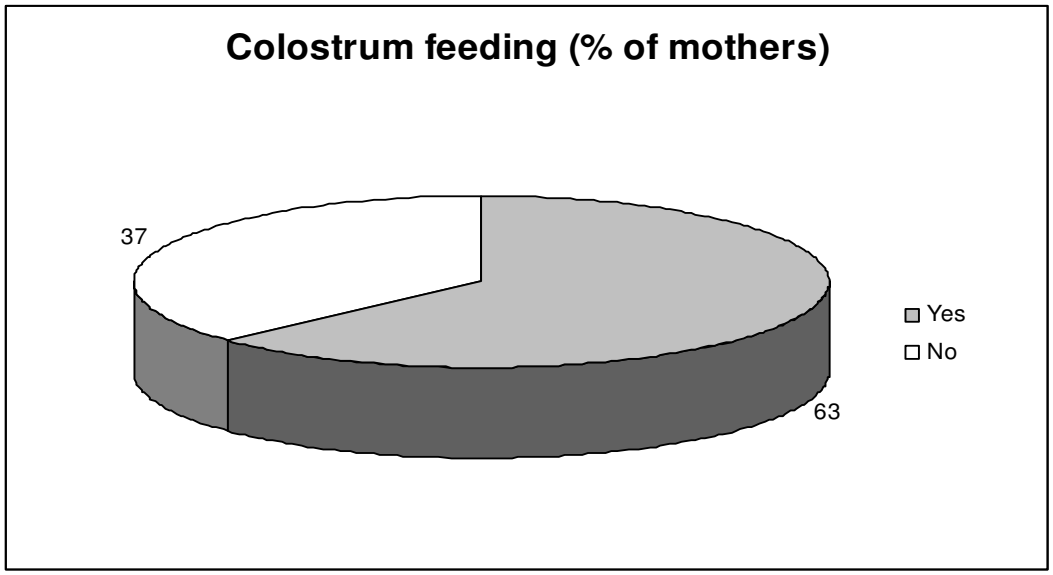

Figure 20: Colostrum feeding (n = 289)

With the next question the practice of providing collostrum to the baby was assesed. According to the interviewees around one third of the children did not receive collostrum.

Additional/different type of fluids other than breastmilk were given within the first three days to 8% of the surveyed children. The survey did not look into the type of these fluids.

Figure 21: Duration surveyed children were exclusively breastfed (n = 289)

Care takers were asked when they started introducing the first semi-solid food to their children. More than two third stated they introduced semi-solids food after the age of six months.

Table 19: Age of child when semi-solid food is introduced

Introduction of semi-solid Foods	# Children	%
Before 6 months	28	30.8
After 6 months	63	69.2
Total	91	100

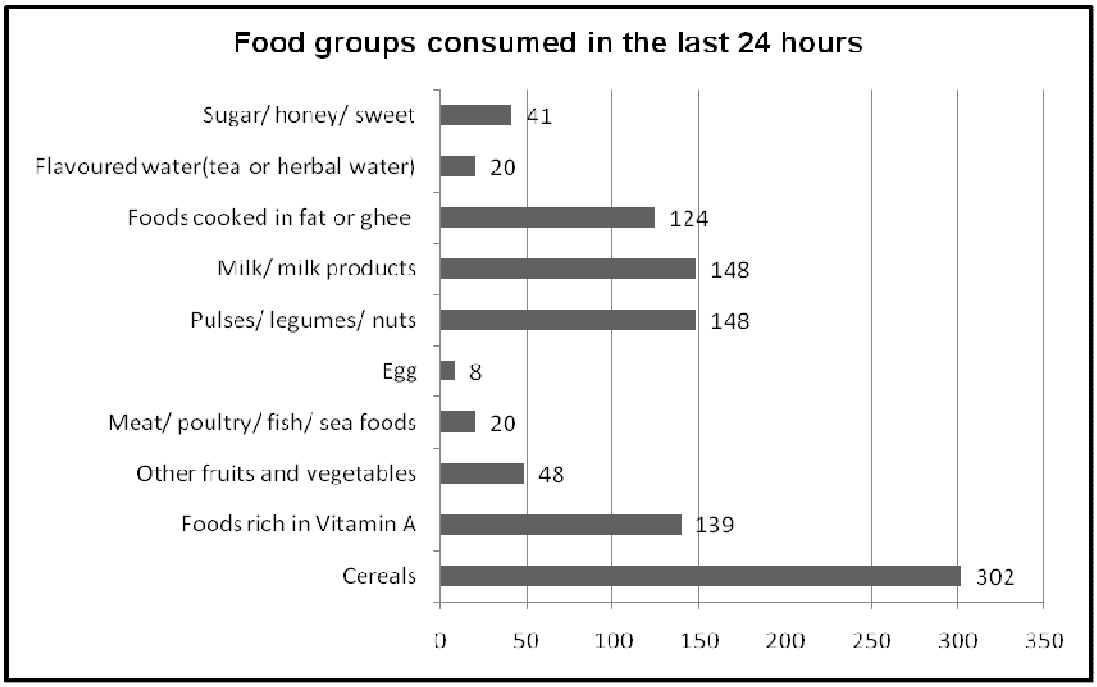

Figure 22: Food groups consumed in the last 24 hours

Regarding food groups consumed in the last 24 hours by the surveyed children nearly all ate cereals. Vitamin A rich veggetables and fruits, pulses and milk products were consumed by around 40% of them. The practice of preparing the food using any type of fat was common to around one third of the care takers. All other food groups were less frequent provided to the children (below 16%) including meat, eggs and sugar/honey/sweets.

Table 20: If not breastfeeding now duration of breastfeeding (N = 156)

Duration	# of Respondents	%
< 6 month	8	5.1
6 months to 1 year	25	16.0
Up to 24 months	89	57.1
>24 months	34	21.8
Total	156	100

Out of 156 children the majority was breastfed for up to 24 months. The main reason why mothers decided to stop breastfeeding was due to a new pregnancy. Only in 15% of the cases the child reaching the age of over 24 months led to the end of providing breast milk. Believing not to have enough breast milk was reason for 17% of the mothers to stop breastfeeding.

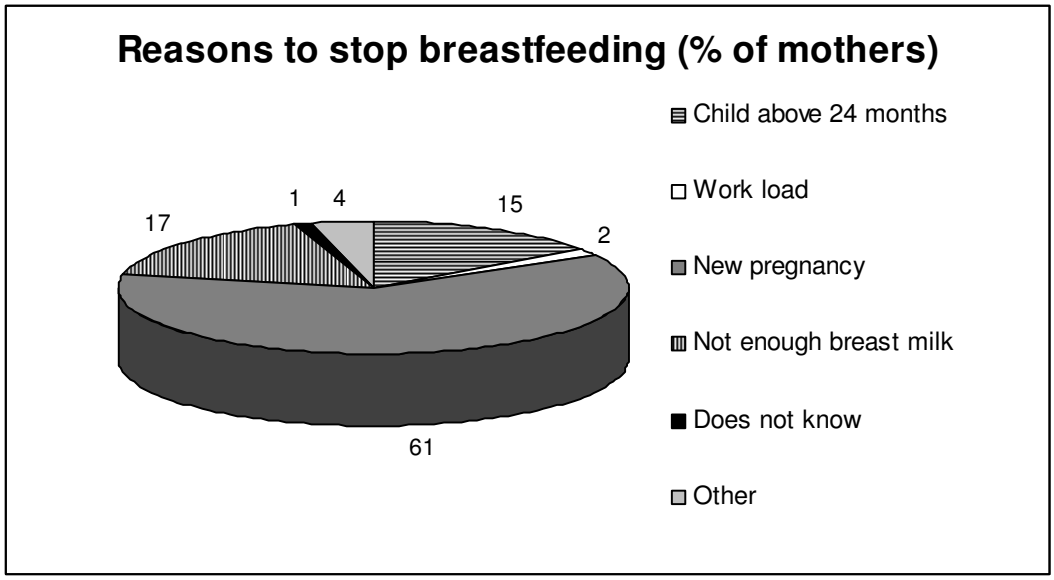

Figure 23: Reason to stop breastfeeding (n = 165)

The next questions investigate caring practices of the surveyed household in regard to children.
If the mother leaves the home the child is mostly left with a sibling younger than 15 years or stays with the mother-in-law/ grandmother or grandfather. The third most common practice is to leave the child on its own at home.

Table 21: Alternative care taker when mother leaves home

Care taker	# of Responses	%
Child comes with me every time	27	8.6
Child stays at home alone	48	15.4
Child stays with mother-in-law/ grandmother/ grand father	90	28.9
Child stays at home with sibling older than 15 years	11	3.5
Child stays at home with sibling younger than 15 years	94	30.1
Child stays home with father	28	9.0
Others	14	4.5
Total	312	100

In most of the cases (69.2%) mothers are the main care givers for their children, the mother-in-law/ grandmother is with 15% the second choice but much less important than the mother herself. Younger siblings are the third important group (6.7%). Fathers (2.6%) and fathers-in-law (3.5%) are less important.

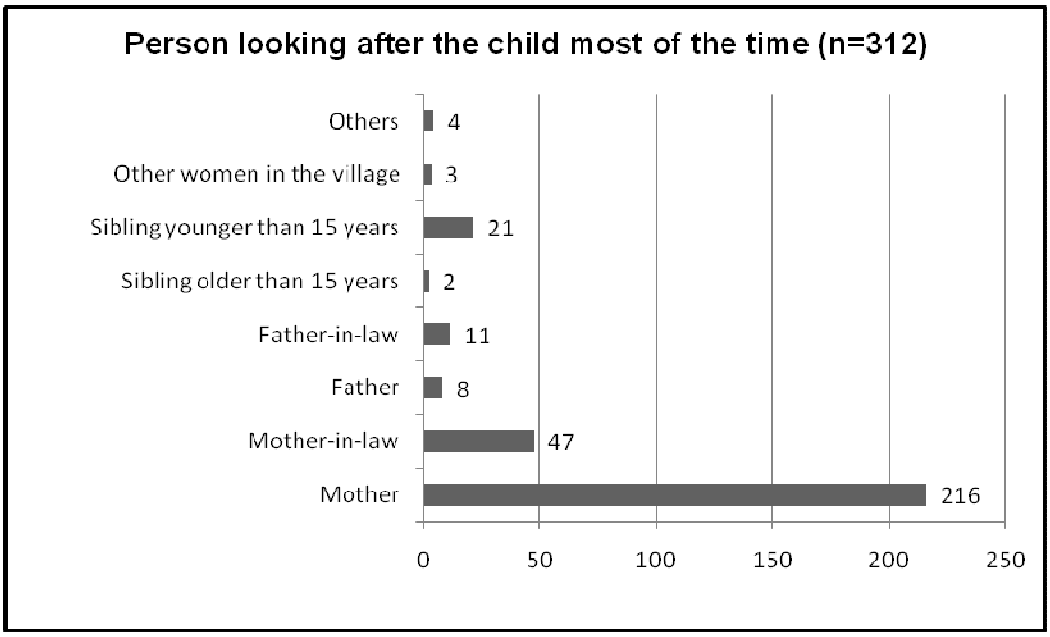

Figure 24: Person looking after the child most of the time

When it comes to who is feeding the child the majority (46%) say the child is eating on its own. The mother is in 36% of the surveyed household feeding the child. Also here the mother-in-law and a sibling younger than 15 years play a role but are much less important than the mother herself.

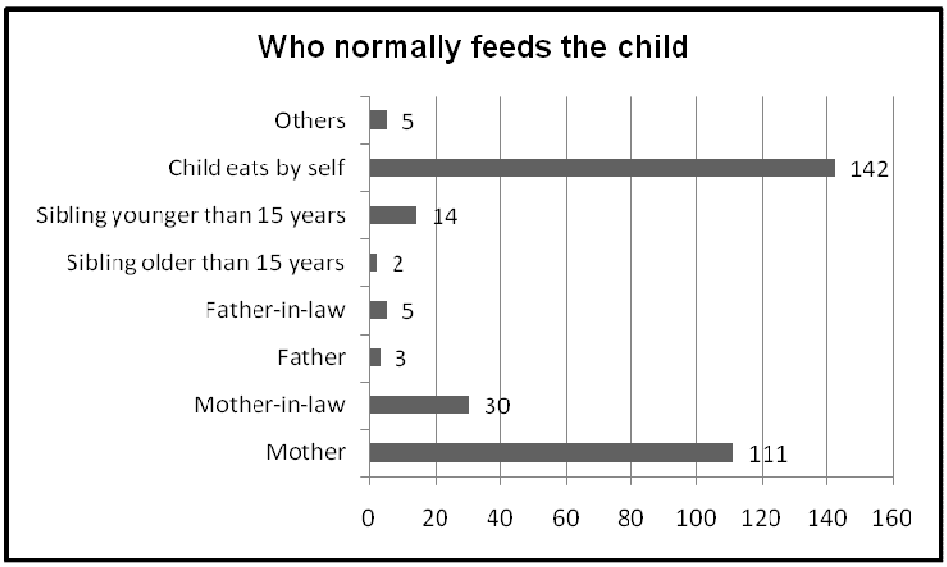

Figure 25: Responsibility of feeding the child (n=312)

For the majority of care takers the mother is the most important person when it comes to the provision of guidance around caring practices. Other women in the village play a more important role in this regard than the mothers-in-law, the grandmothers and the fathers.

Table 22: Responsible providing advice to care taker

Advice Giver	# of Responses	%
Mother	138	44.2
Mother-in-law/ grandmother	41	13.1
Father	40	12.9
Father-in-law	6	1.9
Other women in the village	70	22.4
Others	6	1.9
Do not know	11	3.5
Total	312	100

When asked at what age the child is considered to be able eating on its own around one third of the respondents stated that the child should be 18 months or even older. Nearly two third believe even younger children can eat without assistance.

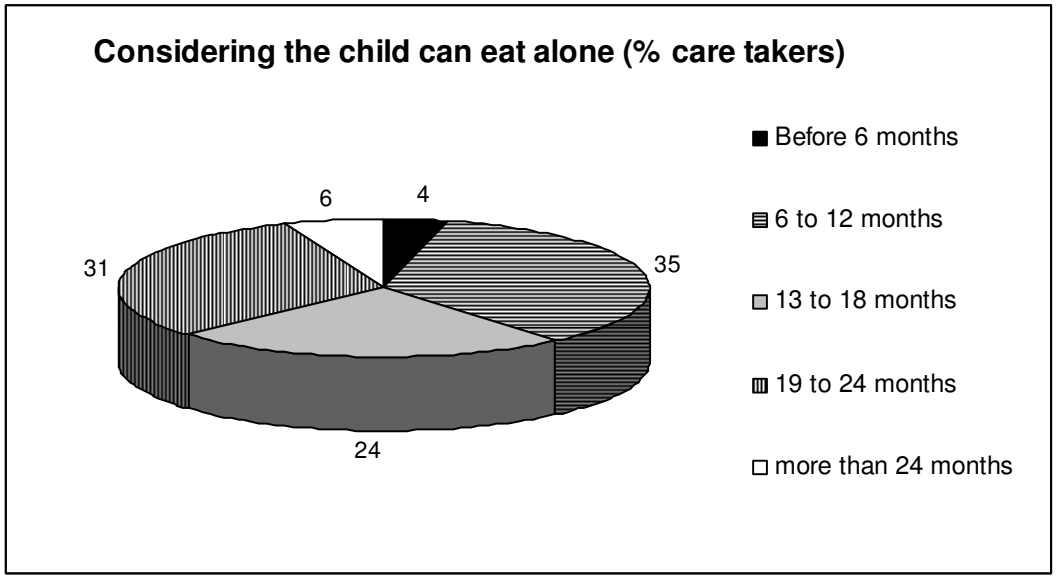

Figure 26: Considering the child can eat alone without the presence of care taker (n = 165)

According to care takers interviewed 59 (19%) of children suffered from diarrhoea within two weeks prior to the survey.

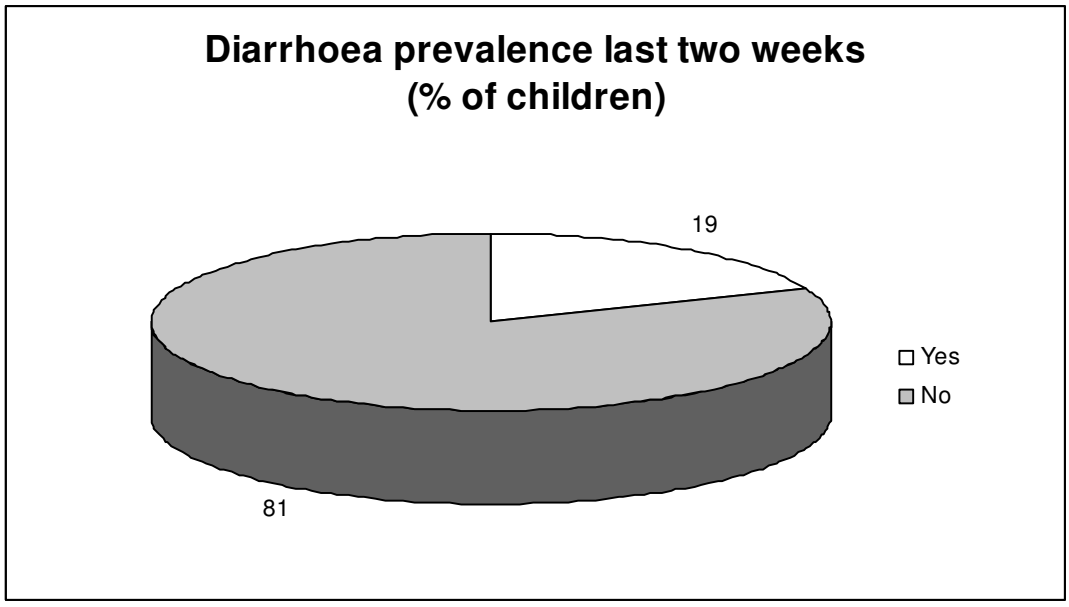

Figure 27: Diarrhoea prevalence among children within last two weeks (n=312)

In cases where the child suffered from diarrhoea in the last two weeks, changes in feeding practices were assessed. In 38% of the cases children received less or no food at all while suffering from diarrhoea. The minority of children were fed more than usual.

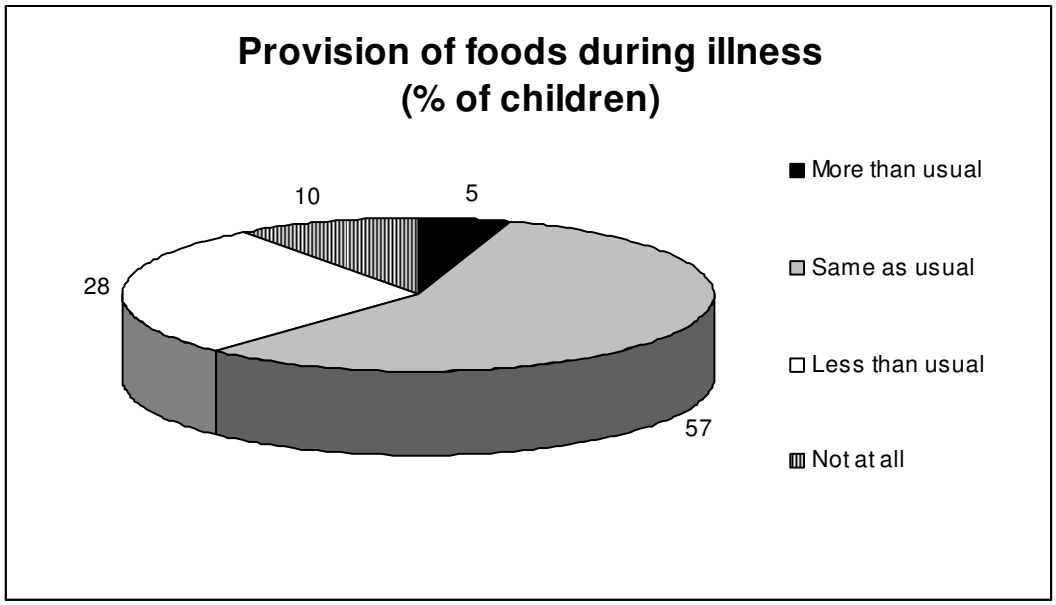

Figure 28: Provision of foods to children during period of illness (n = 59)

In around one third of the cases children received less or no fluids at all while suffering from diarrhoea. The minority of them received more fluids than usual.

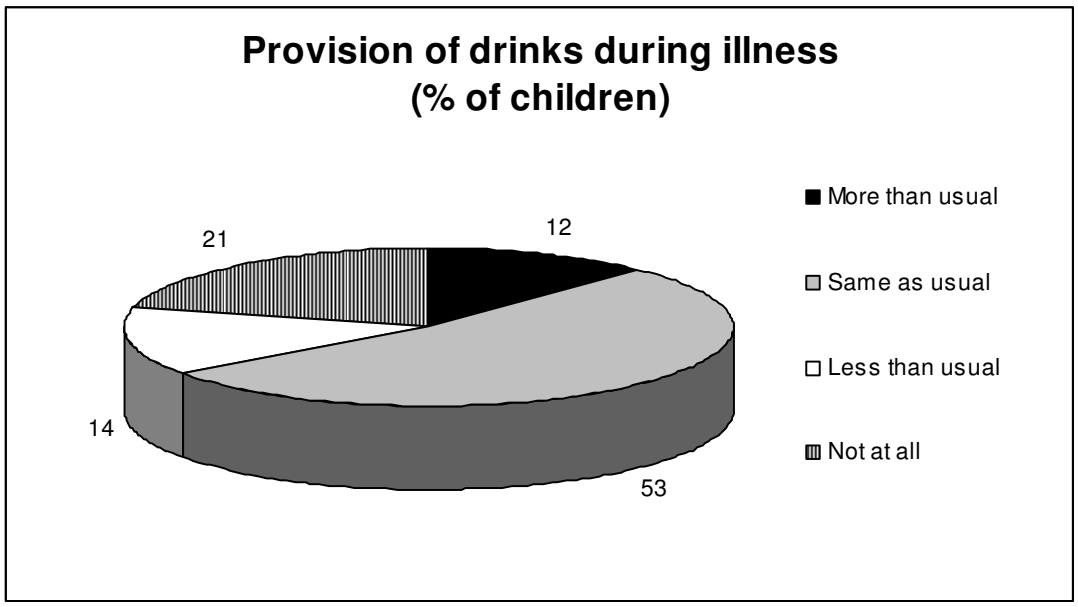

Figure 29: Provision of drinks to children during period of illness (n = 59)

6 Causal Analysis

In this chapter correlations between different indicators related to malnutrition were analysed to identify high risk groups and behaviours for moderate and/ or severe acute malnutrition. For this analysis, indicators of children identified in the anthropometric survey as severe or moderate malnourished were compared to children identified as normal nourished. Household, health seeking and nutrition data available for this analysis comes from the 294 interviewed households only.

6.1 Anthropometry

Assumption 1: Global acute malnutrition is linked to the age of the child

→Children older than 24 months were 2.38 (or 1.17 – 4.87, 95% C.I.) times more likely to be global acute malnourished than children less than 24 months of age.

Table 23: Age of the child and GAM (<-2 Z-score, WHO reference)

Age Group	SAM	MAM	Normal	Total	χ^2 P value
≤ 24 months	7 (5.34%)	17 (12.98%)	107 (81.68%)	131 (100%)	8.5422 0.014
> 24 months	1 (0.61%)	13 (7.98%)	149 (91.41%)	163 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Table 23 depicts that out of 294 children 38 (12.92%) were global acute malnourished (< -2 Z-score). SAM and MAM were observed high in the age group more than 24 months. The association was significant (P < 0.05).

Assumption 2: Global acute malnutrition is linked to gender

→A significant association was not seen between GAM and gender

Table 24: Sex of child and GAM

Sex	SAM	MAM	Normal	Total	χ^2 P value
Male	1 (0.68%)	18 (12.16%)	129 (87.16%)	148 (100%)	5.7023 0.058
Female	7 (4.79%)	12 (8.22%)	127 (86.99%)	146 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

6.2 Household Indicators

Assumption 3: GAM is linked to the educational status of the mother

→ No significant correlation was found

Table 25: Educational status of mother and GAM

Educational Status	SAM	MAM	Normal	Total	χ^2 P value
Illiterate	6 (2.93%)	20 (9.76%)	179 (87.32%)	205 (100%)	0.2431 0.886
Literate	2 (2.25%)	10 (11.24%)	77 (86.52%)	89 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294(100%)	

Assumption 4: GAM is linked to the educational status of the father

→ GAM is significantly higher in households where the father is illiterate

Table 26: Educational status of father and GAM

Educational Status	SAM	MAM	Normal	Total	χ^2 P value
Illiterate	5 (5.43%)	14 (15.22%)	73 (79.35%)	92 (100%)	7.84 0.02
Literate	3 (1.49%)	16 (7.92%)	183 (90.59%)	202 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 5: GAM is linked to caste/ethnic group

→ There is no significant correlation between GAM and caste/ethnic group when SAM and MAM is considered as separate groups. **However when only two groups are considered (<-2 and >-2 z-score) children from lower castes were three times more likely to be malnourished than children from middle castes.**

Table 27: Caste/ ethnic group and GAM

Caste	SAM	MAM	Normal	Total	χ^2 P value
Lower caste[1]	5 (7.05%)	9 (12.68%)	57 (80.28%)	71 (10%)	8.1642 0.086
Middle caste[2]	0 (0.0%)	3 (7.14%)	39 (92.86%)	42 (100%)	
Upper caste[3]	3 (1.66%)	18 (9.94%)	160 (88.40%)	181 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

[1] Low caste includes Kami, Damai, Sarki, Gaine etc.
[2] Middle caste includes Magar, Tamang, Rai, Limbu, Sherpa, Bhote etc
[3] Upper caste includes Brahman, Kshetri, Thakuri, Sanyasi

Assumption 6: GAM is linked to who is head of the household

→ There is no significant correlation between who is head of household and GAM

Table 28: Head of household and GAM

Head of Household	SAM	MAM	Normal	Total	χ^2 P value
Mother	0.0 (0.0%)	0.0 (0.0%)	7 (100%)	7 (100%)	5.6747 0.684
Father	6 (2.96%)	21 (10.29%)	177 (86.76%)	204 (100%)	
Grandmother	0.0 (0.0%)	0 (0.0%)	16 (100%)	16 (100%)	
grandfather	2 (3.13%)	8 (12.50%)	54 (84.8%)	64 (100%)	
Other	0 (0.0%)	1 (33.33%)	2 (66.67%)	3 (100%)	
Total	8 (2.72%)	30 (10.20)	256 (87.07%)	294 (100%)	

It is worth to mention that in households headed by the mother or the grandmother no severe or moderate malnourished child was found in the sampled group. Severe acute malnourished children were exclusively found in households headed by fathers or grandfathers.

Assumption 7: GAM is linked to size of household

→ There is no significant correlation between size of household and GAM

Table 29: Size of the household and GAM

Size of Household	SAM	MAM	Normal	Total	χ^2 P value
≤ 5 persons	1 (0.79%)	15 (11.81%)	111 (87.40%)	127 (100%)	3.6415 0.162
>5 persons	7 (4.19%)	15 (8.98%)	145 (86.83%)	167 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 8: GAM is linked to number of children less than five years

→ There is no significant correlation between the number of children under five years and GAM

Table 30: Number of under five children and GAM

Number of under 5 Children	SAM	MAM	Normal	Total	χ^2 P value
≤ 2 children	8 (1.33%)	29 (10.32%)	244 (86.83%)	281 (100%)	0.497 0.780
> 2 children	0 (0.0%)	1 (7.69%)	12 (92.31%)	13 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 9: GAM is linked to means of livelihood

→ There is no significant correlation between means of livelihood and GAM

Table 31: Means of livelihood and GAM

Means of Livelihood	SAM	MAM	Normal	Total	χ^2 P value
Farming	6 (2.75%)	24 (11.01%)	188 (86.24%)	218 (100%)	7.1439 0.308
Paid services	0 (0.0%)	0 (0.0%)	29 (100%)	29 (100%)	
Casual labour	2 (6.67%)	4 (13.33%)	24 (80.00%)	30 (100%)	
External resources	0 (0.0%)	2 (11.76%)	15 (88.24%)	17 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07)	294 (100%)	

Assumption 10: GAM is linked to land ownership

→ There is no significant correlation between land ownership and GAM

Table 32: Land ownership and GAM

Land Ownership	SAM	MAM	Normal	Total	χ^2 P value
[4]Poor (No land)	1 (1.08%)	11 (11.83%)	81 (87.10%)	93 (100%)	4.9604 0.762
[5]Rich (with land)	7 (3.48%)	19 (9.45%)	175 (87.06%)	201 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 11: GAM is linked to ownership of livestock

→ There is no significant correlation between livestock ownership and GAM

Table 33: Availability of livestock and GAM

Ownership of Livestock	SAM	MAM	Normal	Total	χ^2 P value
No	0 (0.0%)	2 (6.67%)	28 (93.33%)	30 (100%)	1.469 0.480
Yes	8 (3.03%)	28 (10.61%)	228 (86.36%)	264 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

[4] Without any agriculture land for farming and/or agriculture production.

[5] Agriculture land > 1 Ropani

6.3 Water and Sanitation

Assumption 12: GAM is linked to source of drinking water

→ There is no significant correlation between source of drinking water and GAM

Table35: Access to safe water and GAM

Access to clean Water	SAM	MAM	Normal	Total	χ^2 P value
Unsafe	1 (1.33%)	9 (12.00%)	65 (86.67%)	75 (100%)	1.0328 0.597
Safe water	7 (3.20%)	21 (9.59%)	191 (87.21%)	219 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	194 (100%)	

Assumption 13: GAM is linked to defecation practice of family member over 5 years of age

→ There is no significant correlation between open defecation versus latrine use and GAM in family member over 5 years

Table36: Defecation practice of person over 5 years of age and GAM

Defecation Practices	SAM	MAM	Normal	Total	χ^2 P value
Closed latrine in own homestead	0 (0.0%)	0 (0.0%)	2 (100.0%)	2 (100%)	
Closed latrine outside of homestead	2 (3.1%)	5 (7.7%)	58 (89.2%)	65 (100%)	
Open latrine/toilet/	0 (0.0%)	2 (8.7%)	21 (91.3%)	23 (100%)	4.387 0.821
Open field / jungle/house yard, roadsides	4 (2.4%)	21 (12.6%)	142 (85.0%)	167 (100%)	
Pond, lake, river, stream	2(5.4%)	2(5.4%)	33 (89.2%)	37(100%)	
Total	8 (2.7%)	30 (10.2%)	256 (87.1%)	294 (100%)	

Assumption 14: GAM is linked to defecation practice of family member less than 5 years

→ There is no significant correlation between open defecation versus latrine use and GAM in family member under 5 years

Table 37: Defecation practice of person over 5 years age and GAM

Defecation Practices	SAM	MAM	Normal	Total	χ^2 P value
Closed latrine in own homestead	0 (0.0%)	1 (20.0%)	4 (80.0%)	5 (100%)	
Closed latrine outside of homestead	0 (0.0%)	4 (12.9%)	27 (87.1%)	31 (100%)	
Open latrine/toilet/	0 (0.0%)	3 (15.8%)	16 (84.2%)	19 (100%)	4.224 0.836
Open field / jungle/house yard, roadsides	8 (3.4%)	21 (9.0%)	205 (87.6%)	234 (100%)	
Pond, lake, river, stream	0 (0.0%)	1 (20.0%)	4 (80.0%)	5 (100%)	
Total	**8 (2.7%)**	**30 (10.2%)**	**256 (87.1%)**	**294 (100%)**	

Assumption 15: GAM is linked to hand washing practices

→ There is no significant correlation between hand washing practices and GAM

Table 38: Hand washing practices and GAM

Hand Washing Practices	SAM	MAM	Normal	Total	χ^2 P value
Soap or oil cake	2 (2.15%)	11 (11.83%)	80 (86.02%)	93 (100%)	
Plain water	4 (2.72%)	14 (9.52%)	129 (87.67%	147 (100%)	6.487
Ash	2 (3.85%)	4 (7.69%)	46 (88.46%)	52 (100%)	0.611
Soil/ clay	0	1 (50%)	1 (50%)	2 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

6.4 Child Health and Nutrition

Assumption 16: GAM is linked to time when child is first put to the breast

→ There is no significant correlation between time when child first put to the breast and GAM

Table 39: Time when child first put to the breast and GAM

Time when child was first put to breast	SAM	MAM	Normal	Total	χ^2 P value
Within 1 hour	0 (0.0)	2 (20%)	8 (80%)	10 (100%)	18.810 0.404
2 to 10 hours	1(2.9%)	1 (2.9%)	33 (94.2%)	35 (100%)	
11 to 15 hours	0 (0.0)	0 (0.0)	3 (100%)	3 (100%)	
16 to 20 hours	0 (0.0)	0 (0.0)	2 (100%)	2 (100%)	
21 to 24 hours	0 (0.0)	1 (100%)	0 (0.0)	1 (100%)	
2 days	0 (0.0)	0 (0.0)	9 (100%)	9 (100%)	
≤ 3 days	0 (0.0)	0 (0.0)	9 (100%)	9 (100%)	
≥ 3 days	1 (4.0%)	5 (25.0%)	19 (75.0%)	25 (100%)	
Not applicable	6 (3.0%)	21 (10.6%)	171 (86.4%)	198 (100%)	
Does not know	0 (0.0)	0 (0.0)	2	2 (100%)	
Total	8 (2.7%)	30 (10.2%)	256 (87.1%)	294 (100%)	

Assumption 17: GAM is linked to feeding colostrums

→ There is no significant correlation between feeding colostrums and GAM

Table 40: Colostrums feeding and wasting (n = 96)

Colostrums Feeding	SAM	MAM	Normal	Total	χ^2 P value
No	0 (0.0%)	7 (20.00%)	28 (80.00%)	35 (100%)	1.0328 0.597
Yes	2 (3.28%)	3 (4.92%)	56 (91.80%)	61 (100%)	
Total	2 (2.08%)	10 (10.42%)	84 (87.50%)	96 (100%)	

Assumption 18: GAM is linked to duration of exclusive breastfeeding

→ There is a significant correlation between the duration of exclusive breastfeeding and GAM. Children exclusively breastfed for up to three months are more likely to be malnourished than children exclusively breastfed for six months.

Table 41: Duration of exclusive breastfeeding and GAM

Exclusive Breast Feeding	Normal children (> -2z score)	Malnourished children (< -2z score)	Total	χ^2 P value
<one month	180 (88.6%)	23 (11.33%)	203 (100%)	24.3102 0.004
≤3 months	1 (20.00%)	4 (80.00%)	5 (100%)	
≤6 months	22 (92.00%)	2 (8.00%)	24 (100%)	
≤9 months	4 (100%)	0	4 (100%)	
≤1 years	5 (71.43%)	2 (28.57%)	7 (100%)	
Still exclusive feeding	18 (85.71%)	3 (14.29%)	21 (100%)	

Child above 24 months	21 (87.50%)	3 (12.50%)	24 (100%)	
Do not no	5 (83.00%)	1 (17.00%)	6 (100%)	
Total	256 (87.07%)	38 (12.93%)	294 (100%)	

Assumption 19: GAM is linked to the time when semi-solid/soft foods are introduced to the child

→ There is no significant correlation between the time when semi-solid/ soft foods are introduced to the child and GAM.

Table 42: Introduction to semi-solid/ soft foods and GAM

Introduction of semi-solid Food	SAM	MAM	Normal	Total	χ^2 P value
Before 6 months	0 (0.0%)	4 (14.29%)	24 (85.71%)	28 (100%)	1.0328 0.597
After 6 months	2 (3.17%)	5 (7.94%)	56 (88.89%)	63 (100%)	
Total	2 (2.20%)	9 (9.89%)	80 (87.91%)	91 (100%)	

Assumption 20: GAM is linked to who is taking care of the child when mother leaves the home

→ There is no significant correlation between who takes care of the child when the mother leaves the home and GAM

Table 43: Care taker while mother has left the home and GAM

Care taker	SAM	MAM	Normal	Total	χ^2 P value
Comes with mother	0 (0.0%)	3 (11.54%)	23 (88.46%)	26 (100%)	
Stays at home alone	1 (2.27%)	6 (13.64%)	37 (84.09%)	44 (100%)	
Stays with Grandmother/ grandfather	3 (3.53%)	11 (12.94%)	71 (83.53%)	85 (100%)	
Stays at home with sibling >15 years	0 (0.0%)	2 (18.18%)	9 (81.82%)	11 (100%)	8.0704 0.780
Stays at home with sibling <15 years	2 (2.27%)	5 (5.68%)	81 (92.05%)	88 (100%)	
Stays with father	1 (3.70%)	3 (11.11%)	23 (85.19%)	27 (100%)	
0ther	1 (7.69%)	0 (0.0%)	12 (92.31%)	13 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 21: GAM is linked to who is mostly taking care of the child

→ There is no significant correlation between who takes mostly care of the child and GAM

Table 44: Care taker and GAM

Care Taker	SAM	MAM	Normal	Total	χ^2 P value
Mother	6 (2.98%)	19 (9.39%)	178 (87.68%)	203 (100%)	
Grandmother	1 (2.33%)	8 (18.60%)	34 (79.07%)	43 (100%)	
Father	0	0	8 (100%)	8 (100%)	
Grandfather	0	1 (9.09%)	10 (90.91%)	11 (100%)	16.1109
Sibling >15 years	0	0	2 (100%)	2 (100%)	0.307
Sibling <15 years	0	1 (5.00%)	19 (95.00%)	20 (100%)	
Other women	0	1 (33.33%)	2 (66.67%)	3 (100%)	
0thers	1 (25%)	0	3 (75.00%)	4 (100%)	
Total	8 (2.27%)	30 (10.20%)	256 (87.07)	294 (100%)	

Assumption 22: GAM is linked to who is feeding the child

→ There is no significant correlation between who is feeding the child and GAM

Table 45: Person normally feeding the child and GAM

Person Feeding the Child	SAM	MAM	Normal	Total	χ^2 P value
Mother	3 (2.94%)	14 (13.73%)	85 (83.33%)	102 (100%)	8.0704 0.78
Grandmother	0 (0.0%)	4 (15.38%)	22 (84.62%)	26 (100%)	
Father	0 (0.0%)	0 (0.0%)	3 (100%)	3 (100%)	
Grandfather	0 (0.0%)	0 (0.0%)	5 (100%)	5 (100%)	
Sibling >15 years	0	0	2 (100%)	2 (100%)	
Sibling <15 years	0	1 (7.69%)	12 (92.31%)	13 (100%)	
Eats by self	4 (2.90%)	11 (7.97%)	123 (89.13%)	138 (100%)	
0ther	1 (20.00%)	0	4 (80.00%)	5 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 23: GAM is linked to who is guiding the care taker

→ There is no significant correlation between who is feeding the child and GAM

Table 46: Person normally giving advice to the care taker and GAM

Person Giving Advice	SAM	MAM	Normal	Total	χ2 P value
Mother	6 (4.58%)	11 (8.40%)	114 (87.02%)	131 (100%)	16.3948 0.174
Grandmother	1 (2.78%)	8 (22.22%)	27 (75.00%)	39 (100%)	
Father	0	4 (10.53%)	34 (89.47%)	38 (100%)	
Grandfather	0	0	6 (100%)	6 (100%)	
Other women in the village	0	5 (7.46%)	62 (92.54%)	67 (100%)	
0ther	1 (10.00%)	2 (20.00%)	7 (70.00%)	10 (100%)	
Do not	0	0	6 (100%)	6 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

Assumption 24: GAM is linked to feeding practices during periods of illness

→ There is no significant correlation between feeding practices during periods of illness and GAM

Table 47: Feeding during period of illness and GAM

Feeding	SAM	MAM	Normal	Total	$\chi 2$ P value
More than usual	0	0	3 (100%)	3 (100%)	
Same as usual	1 (3.33%)	3 (10.34%)	26 (86.67%)	30 (100%)	
Less than usual	1 (14.29%)	1 (14.29%)	5 (71.43%)	7 (100%)	1.4143 0.994
Not at all	0	1 (16.67%)	5 (83.33%)	10 (100%)	
Not applicable	7 (2.89%)	25 (10.33%)	210 (86.78%)	242 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07)	294 (100%)	

Assumption 25: GAM is linked to provision of fluids during periods of illness

→ There is no significant correlation between provision of fluids during period of illness and GAM

Table 48: Fluids given during period of illness and GAM

Drinks given	SAM	MAM	Normal	Total	$\chi 2$ P value
More than usual	0	0	6 (100%)	6 (100%)	
Same as usual	0	3 (10.34)	26 (89.66%)	29 (100%)	
Less than usual	1 (14.29%)	1 (14.29%)	5 (71.43%)	7 (100%)	5.7688 0.673
Not at all	0	1 (10.00%)	9 (90.00%)	10 (100%0	
Not applicable	7 (2.89%)	25 (10.33%)	210 (86.78%)	242 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 987.07%)	294 (100%)	

Assumption 26: GAM is linked to provision of breast milk during periods of illness

→ There is no significant correlation between provision of breast milk during period of illness and GAM

Table 49: If currently breastfed provision of breast milk during period of illness and GAM

Breastfeeding	SAM	MAM	Normal	Total	χ^2 P value
More than usual	0	0	4 (100%)	4 (100%)	
Same as usual	0	2 (9.52%)	19 (90.48%)	21 (100%)	
Less than usual	0	0	3 (100%)	3 (100%)	2.4279 0.992
Not at all	0	0	3 (100%)	3 (100%)	
Not applicable	8 (2.50%)	28 (10.69%)	226 (86.26%)	262 (100%)	
Total	8 (2.72%)	30 (10.20%)	256 (87.07%)	294 (100%)	

CHAPTER 7

7 Discussion

7.1 Anthropometric Analysis

According to the WHO classification 10-14% GAM indicates a critical nutrition situation, therefore Jajarkot with a GAM rate of 10.5% falls just between the cut-off points classifying the district as serious in terms of its nutritional situation.

The national CMAM protocols for the pilot project in Nepal define that at community level MUAC screening through FCHVs is the standard methodology for referral of severely acutely malnourished children. At health posts and primary health care centers additional anthropometric measurements such as weight for height is used for screening and admission. In addition moderately malnourished children identified using MUAC will receive nutrition counselling and follow up home visits to assist them in their community-based recovery. In case of MAM plus a serious medical complication children will be admitted to the inpatient services for medical treatment. Based on the Jajarkot survey findings the following severe and moderate cases can be expected for referral and nutrition counselling through FCHVs:

Table 50: Expected case load for referrals and counselling through FCHVs using MUAC

MUAC	# Children (6-59 months) (n=947)	SAM prevalence (%)	# Children expected in Jajarkot[6] CMAM
<110mm	9	1.0	244
<125 and >=110mm	131	13.8	3,363

A low MUAC correlates to a high risk of mortality and normally MAM rates assessed using MUAC are lower than using WHO Z-score. In Jajarkot the number of children identified as moderate acute malnourished was found to be higher (13.8%) than using WHO Z-score (8.1%). Assuming that the MUAC measurement was done accurately this means that many of the children are heading towards severe malnutrition with a high mortality risk if their situation further deteriorates.
The nutrition counselling of care takers with moderate malnourished children through FCHVs might be the right mechanism to ensure moderate malnourished children are already assisted before they reach a critical condition with a high mortality risk.

In addition the new agreed MUAC standards for classifying SAM will be already introduced in the CMAM pilot programme in Nepal. Children with a MUAC of <115mm will be classified as

[6] The total population for Jajarkot district is 134, 868 with an estimated 18% (24,369) in the age of below five years of age.

severe acute malnourished instead of using the previous cut off point of <110mm. This will ensure critical children will be identified, referred and treated timely.

Data for chronic malnutrition and underweight was collected as part of the survey. However in only 8.5% (n=80) of the cases the age data provided by the care takers was confirmed through a document such as an immunization card or a birth certificate. Therefore anthropometric indicators relying on age data (stunting and underweight) were completely excluded from the data analysis.

Neither significant correlation nor noticeable difference was identified between malnutrition and gender.
As expected the highest number of malnourished children was identified in the age group six to 24 months which includes the critical phase of weaning. A significant correlation was identified between malnutrition and children below/ above the age of 24 months with a much higher risk of malnutrition for the younger ones. Possible explanations are very much linked to child health and nutrition (please refer to chapter 7.6).

7.2 Health Seeking Behavior

Just above half of the sick children were brought for medical treatment, out of them less than two third to a government health facility, one third to private medical service providers and only less than 10% of them to the community based FCHV. Believing that government health services lack quality is mostly the reason for not seeking help at a HP/SHP or PHC.

With the CMAM programme only run at government health facilities trust into these free services has to be strengthened ensuring the programme is accepted and coverage is sufficient to reduce malnutrition in the district. The recognition of FCHVs as the first instance for consultation in case of child illness might as well be strengthened through their involvement in nutrition screening and referral of the malnourished.

With particularly low caste families affected by malnutrition free treatment at government facilities should be considered as the first option for treatment. However if the quality of the provided health and nutrition services continues to be seen as too low, private practitioners will continue benefiting and the very poor will continue spending their scarce financial resources on health care or might be completely missed out with health services. The CMAM programme with its often quick visible impact can be an instrument helping people to regain trust in government health services and further strengthening the position of the FCHVs.

7.3 Household Information

It was expected that the educational status of the mother might influence the nutritional status of her children. This could not be confirmed through the collected data in Jajarkot. However a significant correlation was found between malnutrition and the literacy status of the father. Moderate and severe malnutrition are clearly more common in households where the father is illiterate. A direct influence of the father through advice provided to the child's care taker seems to be less likely (only less than 15% of fathers/ fathers in law give usually advice). An

indirect influence is possible through less gender disparity in the household and improved child caring and feeding practices created by higher levels of awareness. In addition it can be assumed that with the education the economic situation of the household improves directly through higher income or indirectly through an increased agricultural production.

For assessing the wealth of the surveyed households and to analyze a possible link between wealth and malnutrition, information on the construction material of the house (floor, walls and roof) was collected. For the floor and the walls local construction materials are used by the vast majority of surveyed households. However for the roof construction only a fifth of the surveyed households used local materials leading to the assumption that these households are poorer than the majority.
Land ownership and possession of livestock was used as another proxy indicator for economic wealth. Around one quarter of the surveyed households were found landless and one tenth without any livestock.
No significant link to malnutrition was identified for all these proxy indicators however, when analyzing the correlation between malnutrition and the caste/ ethnic group, a significant link was identified. Households belonging to the low castes (which often accumulate a number of the above listed proxy indicators) have a three times higher risk having malnourished children than households from the middle castes. Surprisingly children from the middle castes are doing best and not the ones from the higher castes as might be expected. Gender disparity is known to be more common in the high castes and might contribute negatively to their child's nutritional situation. A second contributing factor could be the choice of less nutritious but more prestigious foods due to a better economic position of the household e.g. breast milk substitutes, sweets.

Against all expectations, in the female headed households (mothers, grandmothers) no malnourished child was found. Possible reason for this could be sufficient financial resources due to labor related migration of the father/husband and/or the female head of household puts the needs of her children first resulting in a very strong caring aspect.

Even though the means of livelihood were not found to be significantly linked to malnutrition, children from households relying on casual labor are more likely to be malnourished. In households making a living from paid services (own business, salaried job) no malnourished child was identified.

7.4 Water and Sanitation

Whereby the majority of households have access to a save water source during monsoon and dry season, a quarter of the surveyed households rely on unprotected wells or ponds, lakes, rivers or streams combined with a nearly non-existing practice of water treatment at household level. A possible link between malnutrition and prevalence of diarrhoea was not analyzed. There were no significant correlations found between source of drinking water, practice of defecation and hand washing practices with malnutrition. In general hand washing practices were found extremely well with nearly all interviewees practicing hand washing after latrine use/ defecation. However the use of soap remains an issue with only 31% doing so.

7.5 Household Food and Nutrition Situation

The data analysis clearly reveals that at the time of the Jajarkot nutrition survey most households were food secure. December is the most food secure months of the year according to the graph showing the months of insufficient household food provision (MIHFP). Hunger gaps occur two times in the year: July/ August and March/April with three quarters of the households experiencing at least one of the gaps per year due to depleted food stocks.
GAM rates in Jajarkot were found to be lower than in the neighboring hill district Accham and the other CMAM pilot districts (see table 46). However all other pre-pilot surveys were done during times of food shortage and therefore a direct comparison of GAM rates is not possible. It is likely that GAM and SAM rates in Jajarkot are higher during food insecure months, equally to the hill district Accham. This should be considered when planning for case loads for the CMAM pilot project in Jajarkot.

Table 51: Malnutrition prevalence of the CMAM pilot districts in comparison (WHO, z-score)

District	Kanchanpur	Humla/ Mugu	Mugu	Bardiya	Accham	Jajarkot
Agency	ACF	ACF	ACF	Concern	ACF	Concern
Time of survey	May 08	May 08	May 08	May 08	Sep 08	Dec 08
Geographical area	terai	mountains	mountains	terai	hills	hills
GAM	17.0%	19.6%	26.6%	16.2%	18.0%	10.5%
SAM	3.3%	3.6%	7.1%	2.8%	3.6%	2.4%

As part of the household questionnaire the household dietary diversity (HDD) was assessed. A similar exercise was done to recall the individual dietary diversity (IDD) of children 6-59 months. Cereals are the most important food for households and the individual children, eggs are the least consumed group. Even though vegetables and fruits were grouped a bit different in the HDD and IDD questionnaire, it is quite obvious that children eat fewer vegetables and fruits (only 6.4% of households consumed any fruits within 24 hours prior to the survey). Children also consume fewer meals prepared with oil or ghee. With 47% of the children and 42% of households having consumed milk or milk products within the last 24 hours prior to the survey the expected more frequent consumption of milk/ milk products by children was not observed. In comparison to the household children eat more often sweets, sugar or honey.
Summarizing the results it can be said that children's diet is less diverse than the household's, less rich in vitamins and minerals and due to less oil/ghee used likely to be less energy dense.

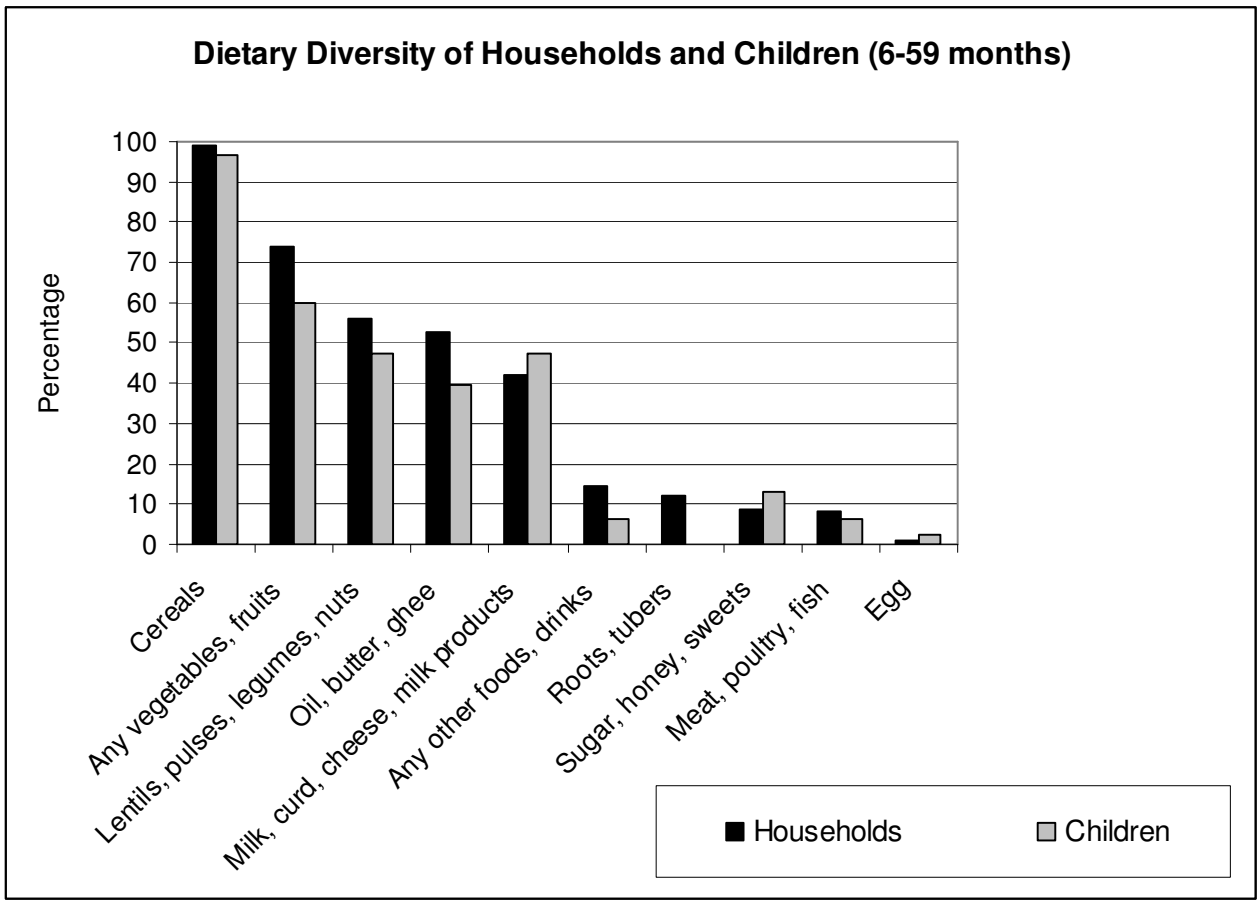

Figure 30: Comparison of HDD and IDD (n = 312)

The majority of households prepare two meals per day with one snack in between. Together with the less energy dense and little diverse and less vitamin-mineral rich food prepared it can be said that children in most households do not receive an adequate nutrient intake in portions they can digest.

7.6 Child Health and Nutrition

A significant link was found between the duration the child was exclusively breastfed and the prevalence of GAM. Children exclusively breastfed for up to three months had a significant higher risk of being malnourished than children exclusively breastfed up to six month.

According to the care takers, nearly half of the children were put to breast 24 hours after birth or even later. It is most likely that within this time period other fluids than breast milk was provided to the newborn even though only 8% of care takers responded positive to that question. In many districts in Nepal the provision of sugar/ honey water to the newborn is not considered interrupting exclusive breastfeeding and therefore it can be assumed that this practice has not been accurately assessed with the used survey methodology.

The collected data reveals that there is a gap of knowledge when it comes to what additional type of fluids the majority of care givers provide to children when exclusive breastfeeding is stopped (mostly after three months) and before the first semi-solid foods are introduced (in general after six months).

The majority of children were breastfed up to 24 months. The second most frequent reason for stopping breastfeeding was due to believing not to have sufficient breast milk. Already during the nutrition emergency response after the flooding in the eastern terai 2008 this was observed to be a major believe of mothers. The link between the quantity of available breast milk and the mother's intake of fluids, nutritional status, workload and stress levels were in general unknown.

A number of questions were asked in regard to who normally provides advice to the mother and who is taking care of the child (when the mother is absent, during feeding, in most of the normal times). For none of the questions a significant link to malnutrition was identified. However malnutrition prevalence is slightly higher if the grandmother, distant relatives or other women from the community take care of the child. Surprisingly children's nutritional status is slightly better when cared for by their siblings younger than 15 years instead of by their mothers. One explanation could be the high work load of mothers leaving insufficient time for child care.

It was assumed that feeding practices during periods of illness are crucial to the nutritional status of the child. No significant link was found. However GAM is higher for the group of children provided less fluids and food as normal during the last period of illness. And in the group of children receiving more fluids and more foods during the last episode of diarrhoea no malnourished child was found at all. It might be possible that in case of frequent reoccurring illnesses the negative impact of inadequate feeding practices accumulates. In this survey frequency of illness was not assessed and therefore a possible link was not analyzed.

7.7 Risk Factors

According to the findings of this nutrition survey a number of factors seem to have a positive or negative influence on children's nutritional status resulting in less or more global acute malnourished children in the households. The following indicators can be considered as higher risk factors (highlighted indicators were found to be significant):

- **The household belongs to the low caste**
- **The father is illiterate**
- The household is headed by the father or grandfather
- The means of livelihood is agriculture, casual labor or depends on external resources
- There are only one or two children under five years of age in the household
- **The child is younger than 24 months**
- The child did not receive colostrum
- **The child was exclusively breastfed for up to three months only**
- The grandmother or any other women from the community are the main care takers

(taking care of the child while mother is away, taking care most of the time, giving advice to the care taker)

- The child is receiving less fluids and foods during periods of illness

The four significant links found to malnutrition were expected. Also findings regarding the provision of colostrum and the feeding practices during periods of illness are in line with nutrition knowledge. Unusual is that malnutrition in male headed households seems to be more common and that in households with higher number of under five children malnutrition seems to be less a problem. Another unexpected finding is that siblings younger than 15 years of age are able to provide good care for their younger brothers and sisters and even better than their experienced grandmothers and mothers. That children of the middle castes are doing best in terms of their nutritional status and not their high caste neighbors is a clear indication that not always food shortage is the reason for malnutrition but rather infant feeding and caring practices.

8 Recommendations

12. The prevalence of global acute malnutrition indicates a significant public health problem in Jajarkot district. Therefore a nutrition program such as CMAM (community based management of acute malnutrition) is recommended to address the nutrition problem in Jajarkot district.

13. The literacy status of fathers is significantly linked to the prevalence of malnutrition. Therefore the governments policy to provide free education to both boys and girls will in long-term contribute to the reduction of malnutrition in Nepal. Studies on how exactly literacy influences child nutrition at household level could help to further advocate for importance of education.

14. CMAM has to ensure inclusion of low caste groups into the programme. Important is:
    - disaggregated data collection
    - home visits to those with possible higher social barriers to access
    - flexible time frames at OTP (outpatient therapeutic program) facilities taking high work load of the poor into consideration
    - covering of transport costs for referral to inpatient treatment facilities
    - availability of free drugs according to the government drug list

15. Trust into the quality of government health services was found to be low among interviewees resulting into a low rate of children brought for the free medical treatment at the government run health facilities in case of illness. It is recommended that the CMAM project coordinates closely with the MOHP at district and regional level to ensure improvement of quality of health services including the availability of free medicines according to the government's policy.

16. The private health service providers and FCHVs should be included in the implementation of the CMAM project and a strong referral system should be established by the project to the nearest outpatient and inpatient treatment facilities.

17. A nutrition education package should be developed for care takers particularly grandmothers/ mothers in law covering the following topics:
    - Utilisation of soap for hand washing
    - Water treatment
    - Food diversity with special focus on importance of milk, fruits and vegetables for children

- Provision of three meals plus two snacks per day for children below five (fruits as snacks)
- Feeding practices during periods of illness
- Meaning, importance and duration of exclusive breastfeeding and links between nutritional status/ fluid intake of mother and quantity of breast milk

18. The survey data indicates a serious sanitation problem in Jajarkot district. The CMAM project should look into advocacy for latrine construction and usage or even be linked to a water and sanitation programme in general.

19. Other sources indicate that the nutritional status of mothers is often correlating with child malnutrition. Therefore it is recommended to revise the survey questionnaire to assess the nutritional status of mothers and to analyse a possible correlation.

20. Further analyse feeding practices of the new-born to better understand reasons for low acceptance of colostrums and the believe about additional required fluids provided after birth, after stopping exclusive breastfeeding and before introducing first semi-solid foods.

21. To better understand risk factors contributing to malnutrition the positive influencing characteristics of their contraries might be worse researching.

    - What are the middle caste households doing better than the households of the higher castes?

    - How is the father using his education for positively influencing his children's nutritional status?

    - What do care takers of low caste well nourished children below 24 months of age do different which could be replicated by low caste families with malnourished children?

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10 Acknowledgements

This Jajarkot Nutrition Survey 2008 provides data on the nutritional status of children, relevant household information, health seeking behavior, breastfeeding practices, food availability and food consumption patterns in the targeted population. This study also provides casual factors and their correlation with the nutritional status of children under five years of age. The study was carried out in December 2008 in Jajarkot district of Nepal with assistance of Concern Worldwide Nepal and the Ministry of Health and Population (MOHP), the Child Health Division, Nutrition Section.

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Basudev Khatiwada
Executive Director
SUDIN-Nepal
Babarmahal, Kathmandu, Nepal
Date: 15th February 2009

11 Annex

Annex 1: Nutrition Survey Training

12-14.Dec 08 Time	Time in minutes	Topics	Trainers
10.00 – 10.30	30 min	Day 1 • Introduction • Expectations of the participant • The objectives of the program and training	Basudev Khatiwada
10.30-11.30	1 hr	• Nutrition situation of 6-59 month children in Nepal • Growth and Development • Nutrition (basic nutrition, nutrients and sources, balance diet)	Basudev khatiwada Sanjay Sanjay
11.30-11.45	15 min	Coffee break	Sudin-Nepal
11.45-13.30	1 hr 45min	• Malnutrition definition, types and basic causes • Symptoms, identification • Warm UP	Sanjay
13:30-14.30	1 hr	• Lunch /Khaza	Sudin-Nepal
14.30-16.30	1 hr 60min	• Discussion of questionnaire in a groups • Addition and modification	Dilli Jee
15.30-15.45	15	Coffee break	Sudin-Nepal
15.45- 16.30	45 min	• Review of first day • Question and Answer	Sanjay R + Basudev K
10.00 – 12.30 10.00- 12.45	2 hr 30 min	Day 2 • Questionnaire practices • Age calculations and use of local calendars to get exact age of the children • Points to be remember before measuring and taking notes • Anthropometrical Measurement (weight, height, MUAC , W/H %age) • Slides show how to measure height and weight • Techniques and Tools (Stunting, wasting and Underweight) • Slides from Nepal, Tajikistan and Kenya	Basudev and Sanjay K Rimal
12:45-14.30	45 min	Questions and answers and Break for Khaza	Sanjay + Basudev + Sudin-Nepal
14:30.00-16.30	2 hr	• Interpretation of degree of malnutrition (Z square and median value , reference card NCHS/CDC/WHO 1982 data use) • Survey technique and Sample size , • Discussion on the selected cluster and allocation of that clusters in the map of Jajarkot • Role of the team leader and planning for the move from Kathmandu to Jajarkot	Sanjay K Rimal 11.1.4.1 Sanjay Rijal
16.30-16.46	15 min	Coffee break	Sudin-Nepal

16.45- 17.30	45 min	• field visit planning and groups • Question and Answer	Sanjay K Rimal Biswa jee and Bista jee
10.00 – 14.00 10.00 – 11.00	4 hr	Day 3 • Field visit 3 groups Danchhi and Dadhikot (field location) • Feed back of the field visit , Problems and constrain	Biswa and Bista Jee
14.00- 15.15	1 hr	• Detail planning for filed trips • Photocopies and necessary documents • Advance and necessary material for field trips collection	Kanchan parajuli

Annex 2: Health and Nutrition Survey Team

Health and Nutrition Survey Team			
S.N.	**Name**	**Designation**	**Address**
1	Basudev Khatiwada	Executive Director	SUDIN-Nepal
2	Sanjay Kumar Rimal	Nutrition Specialist (Consultant)	SUDIN-Nepal
3	Sanjay Rijal	Guest Research Advisor	UNAIDS
4	Seshananda Sanjel	Data Analysist/Report writer	KUSMS-Dhulikhel
5	Basanta Khatiwada	Research Asistant	SUDIN-Nepal
6	Dilli Ram Aryal	Team Leader	SUDIN-Nepal
7	Hari Saran Bista	Team Leader	SUDIN-Nepal
8	Kanchan Parajuli	Team Leader	SUDIN-Nepal
9	Bishwa Raj Pokharel	Team Leader	SUDIN-Nepal
10	Suresh Bhattarai	Team Leader	SUDIN-Nepal
11	Hari Khatiwada	Team Leader	SUDIN-Nepal
12	Ashok Rawal	Enumerator	SUDIN-Nepal
13	Upendra Raj Dhakal	Enumerator	SUDIN-Nepal
14	Manoj Nepali	Enumerator	SUDIN-Nepal
15	Shyam Bhandari	Enumerator	SUDIN-Nepal
16	Anup Pokharel	Enumerator	SUDIN-Nepal
17	Sudip Chiluwal	Enumerator	SUDIN-Nepal
18	Jitendra Malla	Local Enumerator	Jajarkot
19	Bhawana Bi. Ka.	Local Enumerator	Jajarkot
20	Ashesh Rana	Local Enumerator	Jajarkot
21	Kailash Khanal	Local Enumerator	Jajarkot
22	Semanta Bi. Ka.	Local Enumerator	Jajarkot
23	Dilip Sing Chand	Local Enumerator	Jajarkot
24	Januka Rokaya	FCHV	Paink VDC-5
25	Kwali Gharti	FCHV	Ramidada-6
26	Radhika Upadhyaya	FCHV	Nayakbada-6
27	Nanda Singh	FCHV	Sakala-3
28	Nain Kumari Shahi	FCHV	Laha-8
29	Kalasa Malla	FCHV	Bhagawati-7
30	Sunita Kumari Chadara	FCHV	Dadagaun-6
31	Sarita Pun	FCHV	Khalanga-8
32	Sita Chand	FCHV	Khalanga-4
33	Hiukali Chand	FCHV	Dhime-2
34	Lalsara Dangi	FCHV	Punma-3

35	Sunita Basnet	FCHV	Jagatipur-7
36	Lila Sharma	FCHV	Sima-1
37	Janaki K.C.	FCHV	Dasera-3
38	Devi Nepali	FCHV	Suwanauli-1
39	Putali Budha	FCHV	Jugathapachour-6
40	Kalana Giri	FCHV	Pajaru-6
41	Nankala Shahi	FCHV	Bhur-7
42	Laxmi Adhikari	FCHV	Karkigaun-7
43	Laxmi Pun	FCHV	Jhapra-6
44	Mana Maya Pun	FCHV	Archhani-1
45	Dhana Sara Shahi	FCHV	Talegaun-8
46	Sita Basnet	FCHV	garkhot-1
47	Nandakala Shahi	FCHV	Majhkot-6
48	Naina Damai	FCHV	Daha-8
49	Pabitra Rawat	FCHV	Salma-3

Annex 3: Selected Clusters

Health & Nutrition Survey, JAJARKOT			
VDC – Name	Ward.N0.	Cluster-Number	Cluster Name
Archhani	1	1	Thhadibhouta
Bhagawatitol	7	2	Khatigurta
Bhhor	7	3	Bhhorchour
Daha	8	4	Sangiya
Dandagaun	6	5	Tattakuine
Dasera	3	6	Sibajitol
Garkhakot	1	7	Matela
Dhime	2	8	Dhime
Jagatipur	1	9	Bahungaun
	7	10	Kustara
Jhapra	6	11	Khalatakura
Jungathapachour	6	12	Biurekuna
Karkigaun	4	13	Kadagaun
Khagenkot	6	14	Halchour
Khalanga	4	15	Bohoragau
	8	16	Pipe
Kortang	8	17	Sirpachour
Lahai	8	18	Airari
Majhkot	6	19	Majhkot
Nayakwada	3	20	Maina
Paink	5	21	Paink
Pajaru	6	22	Rautangaun
Punma	3	23	Chhiprena
	9	24	Dokana
Ragda	0		
Ramidanda	6	25	ghartigaun
Rokayagaun	0		
Sakala	3	26	Bandala
Salma	3	27	Thhapbuwa
Sims	1	28	Chourtol
Suwanauli	1	29	Midukatol
Talegaun	8	30	Dogree
Thalaraikar	0		

Annex 4: Additional Questionnaire for the Causal Analysis of Nutrition Status

Nepal CMAM Additional Health and Nutrition Survey Questionnaire				A
One sheet per selected household				
District:……. VDC: …… Village: …….. Ward: ……..				
Cluster # …… Team #: …….. HH #: …….				
Name of interviewer: …… Date: ……../……../……..				
	हरेक प्रश्नको उत्तर एक मात्र र उपयुक्त कोड अनुसार दिनुपर्नेछ ।			
Q #	**घरधुरी विवरण/HOUSEHOLD INFORMATION**	**Answers**	**Questions answers**	
1	यो घरको घरमुली को हो ? Who is heading the household?		1= आमा/mother; 2 = बुवा/father 3 = हजुरआमा/grandmother; 4=हजुरबुवा/grandfather 9 = अन्य/Other (specify) 99 = जवाफ दिन्न/no answer	
2	घरको कसले अन्तर्वार्तामा जवाफ दिइरहेको हो ? Who in the household is answering the questionnaire?		1= आमा /mother; 2 = बुवा/father 3 = हजुरआमा/grandmother; 4=हजुरबुवा/grandfather 9 = अन्य/Other (specify) 99 = जवाफ दिन्न/no answer	
3	घरमा कति जना बस्छन र एउटै भान्सामा खान्छन ? How many people live in this household and eat from the same kitchen?		1-50 for number of HH members परिवारका जम्मा सदस्यहरुको संख्या 99 = no answer जवाफ दिन्न	
4	घरमा ५ वर्ष मुनिका कति वटा वच्चाहरु छन ? How many of these are children under the age of five?		0-25 for # of children under five in HH ५ वर्षमुनिका सबै वालवालिकाहरुको संख्या 99 = no answerजव	
5	वच्चाको आमा र बुबाले कति पढेका छन ? How many years of schooling have the mother and father of the household completed ?		Exact number of COMPLETED year(s)/ विधालयमा अध्ययन पुरा गरेको वर्ष 0 = illiterate/ निरक्षर 1 = primary / प्राथमिक 2 = secondary/ माध्यमिक 3 = Intermediary level/प्रमाण पत्र तह 4 = Bachelor level and more/स्नातक वा सो माथि 9 = Non-Formal/Literateअनौपचारिक वा साक्षरता	
	आमा 5A: Mother			
	बुवा 5B: Father			

			88 = Do not know/ थाहा छैन 99 = No answer/जवाफ दिन्न
6	घर परिवारको जिविकाको मुख्य साधन (यस मौसमको) के हो ? What is the household's principle means of livelihood (during this season)?		1= Crop farming/खेतिपाती 2= Livestock farming/Poultryपशु र पंक्षीपालन 3= Casual wage labour / Portering/ज्याला मजदुरी 4= Remittances/बैदेशिक रोजगार 5= Own business or salaried job नीजि व्यापार वा जागिर 6= Firewood / natural resources collection/sale दाउरा वा प्राकृतिक श्रोत संकलन र विकी 7= Fishing माछा मारेर बेच्ने 8 = Assistance programmes (pensions, NGO, disability allowance)/सहयोग (पेन्सन, संस्थागत, अपांगता) 99 = No answer/जवाफ दिन्न
	जिविकाको मुख्य उपाय Most important means of livelihood		
7	घरको छाना के ले बनेको छ? (अवलोकन गर्ने) Construction material of ROOF (observation)		1= Mud/माटो 2 = Thatched / bamboo/vखर वा बाँस 3 = Slate / local tiles/ढुँगा वा स्थानिय टाइल 4= CGI sheet/ग्याल्भानाइज्ड सीट कर्कट पाता 5 = Concrete/कन्क्रिट 6= Timber/काठ 8 = Do not knowथाहा छैन 99 = No answer /जवाफ दिन्न
8	घरको भुइ के ले बनेको छ? Construction material of FLOOR (observation)		1= Mud / earth / dung गोवर माटो 2 = Wooden planks / bamboकाठको फलेक वा बाँस 3 = Concrete / cementसिमेन्ट कन्क्रीट 4= Ceramic tilesसेरामिक टाइल 5 = Carpet चट्टाइ 8 = Do not knowथाहा छैन 99 = No answer उत्तर दिन्न

9	घरको दिवाल वा भित्ता के ले बनेको छ? (अवलोकन गर्ने) Construction material of WALL (observation)		1= Cement and brickसिमेन्ट र इँटा 2 = Stone and mudढुंगा र माटो 3 = Bambo and cementबाँस र सिमेन्ट 4= Woodकाठ 5 = Mudमाटो 6 = Plastic / tarpaulin प्लास्टिक 7 = Bamboo strawबाँसको भिंजा 8 = Do not know 99 = No answer
10	घरको कुनै सदस्यको आफनो नाममा जग्गा छ ? Do any members of this household own any agricultural land?		0 = NO/छैन 1 = YES/छ 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
11	घरको सदस्यहरुको नाममा कति जग्गा जमिन छ ? How much agricultural land do members of this household own?		Q11A fill in number /उत्तर अंकमा लेख्नुहोस 1-19 = number of Dhur/धुर Q11B fill in number /उत्तर अंकमा लेख्नुहोस 1-19=number of Katha/कट्ठा Q11C 1-98= number of Bighas/विगाहा 995= 99 or more Bighas/सो भन्दा बढि 996 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	धुर 11A: Number of DHUR:		
	कटठा 11B: Number of KATHA:		
	विगाहा 11C: Number of BIGHAS:		
12	घरमा कुनै पशु चौपाया वा पछी छन ? Does the household own any livestock, herds, farm animals or poultry?		0 = NO/छैनन 1 = YES/छन 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	खानेपानी तथा सरसफाई / WATER & SANITATION		
13	खानेपानी कहाँबाट ल्याउनुहुन्छ ? Where does your household get drinking water?		1= Public tap/सार्वजनिक धारा 2= Private tap/नीजि धारा 3 = Tubewell / borehole/tradel pump हातेकल, नक्ली, बम्बा वा ढिकी पम्प 4 = Protected dug well / spring/सुरक्षित कुँवा, इनार वा मुल 5 = Unprotected well /असुरक्षित कुवा वा इनार 6 = Rainwater/वर्सादको पानी 7 = Pond, lake, river,
	13A: During the monsoon/बर्षादको मौसममा		
	13B: During the dry season/हिउँद वा सुख्खा मौसममा		

			stream/पोखरी, ताल वा खोला 8 = Vendor / buy from shop/किनेर 9 =Private but neighbours नीजि तर छिमेकी 99 = No answer /उत्तर दिन्न
14	पानी सफा र सुरक्षित बनाउन के उपाय गर्ने गरेको छ ? Does the household do anything to the water to make it safer to drink? If No, go to Q16.		0 = NO/छैन 1 = YES/ छ 88 = Does not know/थाहा छैन 99 = No answer उत्तर दिन्न
15	यदि भए धेरैजसो के उपाय गर्ने गरेको छ ? If Q14=YES, what do you usually do to make the water safer to drink?		1 = Boil/उमाल्ने 2 = Ceramic filter/फिल्टर 3 = Chlorine treatment/क्लोरिन हालेर उपचार गर्ने 4 = Solar disinfection/घाममा राख्ने 5 = Let it settle//राखेर 6= Filter with a cloth/कपडाले छानेर 99 = No answer/उत्तर दिन्न
16	घरको सदस्यहरुले कहाँ दिशापिसाब गर्छन ? Where do members of your household usually defecate?		1= Closed latrine in own homestead/घरभित्रको बन्द चर्पी 2 = Closed latrine outside of homestead/घर बाहिरको बन्द चर्पी 3 = Open latrine/toilet/खुला चर्पी 4 = Open field / jungle/house yard, roadsides घरआंगन, बाटो छेउ, खुला खेत वा जंगल 5 = Pond, lake, river, stream/पोखरी, ताल, नदि वा खोला 99 = No answer/उत्तर दिन्न
	पाँच वर्ष भन्दा माथिका सदस्यहरु 16A: HH members over 5 years old		
	पाँच वर्ष भन्दा मुनिका वच्चाहरु 16B: HH members under 5 years old		
17	तपाई कहिले हात धुनुहुन्छ ? When do you wash your hands?		0 = NO/ हैन 1 = YES/ हो 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	खाना पकाउनु अघि 17A: Before cooking		
	खाना खानु अघि 17B: Before eating		
	दिशा गरिसकेपछि 17C: After using latrine		
	विरामी वच्चा हेरे पछि 17D: After attending a child who defecated		
	वच्चालाई स्तनपान गराउनु अघि 17E: Before breastfeeding		
18	हात धुनको लागि के प्रयोग गर्नु हन्छ ? What do you use to wash your hands?		1 = Soap or oil cake/ सावुन वा पिना 2 = Plain water/सादा पानी 3 = Ash/खरानी 4=Soil/Clay/माटो 99 = No answer/ उत्तर

			दिन्न
	खाधान्न उपभोग/Food Consumption		
19	हिजो दिउसो र राती के के खानेकुराहरु खानुभयो ? Which type of food did you or anyone in your household eat yesterday during the day and night?		0 = If nobody in the household ate the food yesterday यदि कसैले खाना नखाएको भए 1 = if anyone in the household ate the food at least once the previous day यदि कमसेकम एक पटक खाना खाएको भए *NOTE: the previous day should be a NORMAL day (not a fasting or a feast day)* (तर अघिल्लो दिनमा कुनै भोज वा व्रत परेको भए सो भन्दा पनि अघिको दिनको बारेमा सोध्नुहोस)
	अन्न चामल वा रोटी 19 A: CEREALS (bread, rice, noodle, roti, maize)		
	आलु, तरुल वा गन्जी वा सखरखण्डा 19B: Root/tuber (potatoes, yams, sweet potatoes)		
	कुनै सब्जी वा तरकारी 19C: Any vegetables		
	कुनै फलफुल 19D: Any fruit		
	मासु (कुखुरा, हाँस वा खसी) 19E: Meat (goat, chicken, duck, etc)		
	अण्डा 19F: Egg		
	माछा, गंगटो वा घुंगी 19G: Fish, crab or shellfish		
	दाल वा गेडागेडी 19H: Lentils/pulses/legumes/nuts		
	दुध, दहि, चिज 19I: Milk/curd/cheese/milk products		
	तेल, ध्यु वा नौनी 19J: Oil/butter/ghee		
	चिनी, मह वा मिठाइ 19K: Sugar/honey/sweets		
	अन्य (चिया कफि वा जडिबुटीयुक्त पानी) 19L: Any other foods (coffee, tea, herbal water, etc)		
20	हिजो तपाईको परिवारले कति पटक खाना खानुभयो? How major many meals did your family eat yesterday?		Enter EXACT number of meals अंकमा लेख्नुहोस
21	हिजो तपाईको परिवारले कति पटक खाजा खानुभयो? How many tiffins/snacks did you family have yesterday?		Enter EXACT number of meals अंकमा लेख्नुहोस
22	यदि घरमा पशुपन्छी भए नियमित रुपमा के के खानुहुन्छ? If the household owns animals (Q12 above), which of their products are regularly consumed by the household?		0 = NO/खाँदिन 1 = YES/खान्छु 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न
	अण्डा 22 A: Egg		
	दुध 22 B: Milk		
	माछा वा मासु 22 C: Meat or fish		
23	विगत बाह महिनामा तपाइको घरपरिवारमा खाधान्नको अभाव भयो ? Did your household experience any food shortage in the past 12 months?		0 = NO/भएन 1 = YES/भयो 88 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न

24	यदि खाधन्न अभाव भएको भए त्यसको खास कारण के थियो ? If food shortages were experienced, what was the primary reason for this shortage?		1= own production/food stocks depleted/ आफनो उत्पादन वा भण्डारको अन्न सकिएर 2= Lack of labour opportunities/lack of income श्रमको अवशर घटेर वा आम्दानीको अभाव भएर 3 = Increase in food prices खानेकुराको भाउ बढेर 4 = Remittances did not come विदेशबाट खर्च नआएर 5 = HH members migrated out परिवारको सदस्य बसाइ सरी आएर 6 = HH members migrated in परिवारको सदस्य बसाइ सरी गएर 7 = Food not available in the market बजारमा खाधन्नको अभाव भएर 8 = No nearby market बजार नजिक नभएर 9 = Other specify अन्य भए उल्लेख गर्ने 77 = Not applicable नमिल्ने उत्तर 88 = Does not know थाहा छैन 99 = No answer उत्तर दिन्न
	असार 24 A: Asad (Jun-Jul)		
	साउन 24B: Shrawan (Jul-Aug)		
	भदौ 24C: Bhadau (Aug-Sep)		
	असोज 24D: Asoj (Sep-Oct)		
	कार्तिक 24E: Kaartik (Oct-Nov)		
	मंसीर 24F: Mangsir (Nov-Dec)		
	पुस 24G: Push (Dec-Jan)		
	माघ 24H: Magh (Jan-Feb)		
	फागुन 24I: Phagun (Feb-Mar)		
	चैत्र 24J: Chait (Mar-Apr)		
	बैसाख 24K: Baisakh (Apr-May)		
	जेठ 24L: Jyesth (May-Jun)		
25	जातिगत विवरण के हो ? What is the caste and ethnic group of the household?		आवश्यक भए थप व्याख्या गर्नुहोस ।
	जात वा जनजातिय समुह 25A Caste/Ethnicity		
	धर्म 25B: Religion		

Annex 5: Additional Health and Nutrition Survey Questionnaire

Nepal CMAM Additional Health and Nutrition Survey Questionnaire						
One sheet per selected household						
District:…….. VDC: …… Village: …… Ward: …….						
Cluster # …… Team #: …….. HH #: ……						
Name of interviewer: …… Date: ……/……/……..						
Q #	**बाल स्वास्थ्य र पोषण/CHILD HEALTH & NUTRITION**	**Child 1 पहिलो बच्चा**	**Child 2 दोस्रो बच्चा**	**Child 3 तेस्रो बच्चा**	**Coded Answers**	
26	Birth date/जन्म मिति	…/…/…	…/…/…	…/…/…	Format should be dd/mm/yyyy अंग्रजी पात्रो	
27	Sex of child/लिंग				1= छोरा male 2 = छोरी female	
28	Is the child currently breastfed?/ बच्चाले हाल दुध पिइरहेको (स्तनपान गरिहेको छ ?				0 = NO/छैन 1 = YES/छ 77 = Does not know/थाहा छैन 99 = No answer/उत्तर दिन्न	
29	बच्चा जन्मेको कति समयपछि तपाइले स्तनपान गराउनु भयो ? How long after birth did you first put the child to the breast?				0 = within 1 hourएक घण्टा भित्र 1-24 = the exact number of hours कति समय पछि खुवाएको If more than 24 hours: write number of DAYS 77 = Not applicable (FOR CHILD ABOVE 24 MONTHS)यदि 24 घण्टा भन्दा बढि भए दिनमा लेख्नुहोस 88 = Does not know 99 = If the HH does not want to answer	
	घण्टा Hours					
	दिन Days					
30	बच्चालाई शुरुको बिगौती दुध खुवाउनुभयो ? Was the child given the colostrum (first milk)				0 = NO/खुवाइन 1 = YES/खुवाएँ 77 = Not Applicable नमिल्ने उत्तर 99 = No answer/उत्तर दिन्न	
31	बच्चा जन्मिएको तीन दिन भित्रमा दुध बाहेक कुनै अरु खानेकुरा पनि दिनुभयो? In the first three days after delivery, was the child given anything other than breastmilk?				0 = NO/दिइन 1 = YES/दिएँ 77 = Not Applicable नमिल्ने 88= Does not know थाहा छैन 99 = No answer/उत्तर दिन्न	

32	यो वच्चालाई तपाइले कति महिना सम्म दुध मात्र (अरु खानेकुरा दिनु अघि) खुवाउनुभयो? For how long did you EXCLUSIVELY breastfeed this child (no other food or liquid given)?				0 = एक महिनाभन्दा सानो Less than 1 month 1-24 = कति महिना Corresponds to number of months 66 = हाल पनि दुध मात्र खुवाउने Still exclusively breastfeeding 77 = नमिल्ने उत्तर Not applicable (child above 24 months) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer
33	कति महिनाको उमेरमा वच्चालाई पहिलो चोटी अरु नरम र गिलो खानेकुरा खान दिनुभयो? At what AGE was the child given semi-solid or soft foods for the FIRST time?				0 = एक महिनाभन्दा कम Less than 1 month 1-24 = कति महिना Corresponds to number of months 66 = हाल पनि दुध मात्र खुवाउने Still exclusively breastfeeding 77 = नमिल्ने उत्तर Not applicable (child above 24 months) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer
34	विगत 24 घण्टाभित्र तपाईले वच्चालाई के खुवाउनुभयो ? What did you feed the child in the last 24 hours?				0 = NO खुवाइन 1 = YES खुवाए 66 = Still exclusively breastfed हाल पनि स्तनपान गराइरहेको 99 = No answerउत्तर दिन्न
	खाधान्न (रोटी, लिटो, हलुवा, जाउलो) 34 A: CEREALS (bread, rice, noodle, roti, maize, etc)				
	भिटामिनयुक्त खानेकुरा (पहेला फलफुल, आँप, मेवा, गाँजर, फर्सि, हाियो सागसब्जी र रस) 34 B: food rich in vitamin A (yellow color vegetables-carrot, pumpkin- or fruits -mango, papaya-, green leaves)				
	अन्य फलफुल तथा सब्जी34 C: Other fruits and vegetables				
	मासु, माछा वा अन्य सि फुड 34 D : Meat, poultry, fish, seafood				
	अण्डा 34 E: Egg				
	दाल, गेडागुडी र बदाम 34 F: Pulses/legumes/nuts				
	34 G: Milk/milk products				
	घ्यु वा तेलमा पकाएको कुरा 34 H: Foods cooked in fat or ghee				
	चिया तथा अन्य 34 I: Flavoured water (tea or herbal water)				
	चिनी, मह वा मिठाई 34 J: Sugar, honey, sweet				

35	यदि हाल स्तनपान गराउनुहुन्न भने कति महिनासम्म वच्चालाई स्तनपान गराउनुभयो ? If NOT breastfeeding, for how many months did you breastfeed this child?				0 = Less than 1 month एक महिनाभन्दा सानो 1-24 = Corresponds to number of months महिना अंकमा लेख्नुहोस 77 = Not applicable (child still breastfed) नमिल्ने उत्तर 88 = Does not knowथाहा छैन 99 = No answerउत्तर दिन्न
36	यदि हाल स्तनपान गराउनुहुन्न भने किन वच्चलाई स्तनपान गराउन छाडनुभयो ? If NOT breastfeeding, why did you stop breastfeeding this child?				1= Child above 24 months वच्चा 24 महिना भन्दा माथि 2 = Workloadकामको चाप 3 = New pregnancyनयाँ गर्भ 4 = Not enough breastmilk प्रसस्त दुध नआउने 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 77 = Not applicable (child still breastfed) 88 = Does not know 99 = No answer
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				
37	दैनिक रुपमा घर छाडेर बाहिर काममा जाँनु पर्दा आफनो वच्चालाई के गर्नुहुन्छ ?When you leave your home to take care of daily activities (work, market, water, etc) what do you usually do with this child?				1= Child comes with me every timeवच्चा सधै म संगै आउछ 2 = Child stays at home alone वच्चा संधै घरमा बस्छ 3 = Child stays with mother-in-law / grandmother वच्चा हजुरआमा संग बस्छ 4 = Child stays at home with sibling older than 15 वर्ष भन्दा ठुला वच्चाहरु संग बस्छ 5 = Child stays at home with sibling younger than 15 भन्दा साना वच्चाहरुसंग बस्छ 6 = Child stays at home with father वच्चा बुवासंग घरमा बस्छ 9 = Other, specify अन्य भए उललेख गर्नुहोस 99 = No answerउत्तर दिन्न
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				
38	हाल वच्चाको देखभाल वा हेरविचार कसले गर्छ ? Who is looking after this child most of the time?				1= Motherआमा 2 = Mother-in-law /Grandmother of the baby सासु हजुरआमा 3= Fatherबुवा; 4 = Grandfatherहजुरबुवा

	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				5 = siblings older than 15; 15 माथिका अन्य वच्चा 6 = siblings younger than 15 15 मुनिका अन्य वच्चा 7= Other women in the village/FCH गाउँका अन्य महिला वा सेविका 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 99 = No answerउत्तर दिन्न
39	सामान्यत वच्चालाई कसले खाना खुवाउँदछ ? Who is normally feeding the child?				1= Mother आमा 2 = Mother-in-law /Grandmother of the baby सासु हजुरआमा 3= Father बुवा 4 = Grandfatherहजुरबुवा 5 = siblings older than 15 15 वर्षभन्दा ठुला अन्य वच्चा 6 = siblings younger than 15 15 बर्ष भन्दा साना अन्य वच्चा 7 = Child eats by itself वच्चा आफैले खान सक्ने 9 = Other, specify अन्य भए उल्लेख गर्नुहोस 99 = No answerउत्तर दिन्न
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				
40	धेरैजसो कसले वच्चाको स्याहार बारे सल्लाह दिन्छ ? Who usually give advice to the caretaker on caring for this child?				1= Mother आमा 2 = Mother-in-law Grandmother सासु rहजुरआमा 3= Fatherबुवा द्ध = Grandfatherहजुरबुवा 5 = siblings older than 15 भन्दा माथिका वच्चा 6 = siblings younger than 15 भन्दा साना वच्चा 7 = Other women in the villageगाउँका अन्य महिला वा स्यमंसेविका 9 = Other, specifyअन्य भए उल्लेख गर्नुहोस 88 = Does not knowथाहा छैन 99 = No answer उत्तर दिनन
	यदि अन्य उत्तर भए उल्लेख गर्नुहोस If answer is OTHER, please specify				

41	तपाईको वच्चाले आफै खान सक्छ भन्ने कुरा तपाइले वच्चाको कुन उमेरदेखि थाहा पाउनु भयो ? When do you consider this child can eat <u>alone</u>, without the presence of a caretaker?				0 = Less than 1 month एक महिनाभन्दा कम 1-24 = Corresponds to number of months जति महिना हो अंकमा लेख्नुहोस 77 = Not applicable (child still breastfed) नमिल्ने उत्तर 88 = Does not knowथाहा छैन 99 = No answerउत्तर दिन्न
42	विगत दुइ हप्तामा वच्चालाई पाखाला लागेको थियो ? Did this child have diarrhoea in the last 2 weeks?				0 = NO/थिएन 1 = YES/थियो 99 = No answer/उत्तर दिन्न
43	विरामी भएको वेलामा त्यो वच्चालाई कुनै खानेकुरा दिनुभयो ? Was the child given FOOD during the illness period?				1 = संधै भन्दा धेरै More than usual; 2 = संधैको जस्तो Same as usual 3 = संधै भन्दा कम Less than usual; 4 = खुवाइन Not at all 77 = नमिल्ने Not applicable (Q42 = NO) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer
44	विरामी भएको वेलामा त्यो वच्चालाई कुनै झोल खानेकुरा दिनुभयो ? Was the child given DRINKS during the illness period?				1 = संधै भन्दा धेरै More than usual; 2 = संधैको जस्तो Same as usual 3 = संधै भन्दा कम Less than usual; 4 = खुवाइन Not at all 77 = नमिल्ने Not applicable (Q42 = NO) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer
45	यदि हाल स्तनपान गराइराखेको भए वच्चा विरामी हुँदा पनि दुध खुवाउनु भयो? If currently breastfeeding, was breastfeeding continued during the illness period?				1 = संधै भन्दा धेरै More than usual; 2 = संधैको जस्तो Same as usual 3 = संधै भन्दा कम Less than usual; 4 = खुवाइन Not at all 77 = नमिल्ने Not applicable (Q42 = NO) 88 = थाहा छैन Does not know 99 = उत्तर दिन्न No answer
Thank you very much for your participation and time!!					

Annex 6: Anthropometric Data Form and Code Book[7]

1. CHILD #	2. HH #	3. Name	4. Sex F or M	5. Date of Birth dd/mm/ yyyy	6. Date of Birth Confirmed Y or N	7. Age in months	8. Weight (kg) ± 0.1 kg	9. Clothes on while weighing	10. Height (cm) ±0.1cm	11. Oedema (Y or N)	12. MUAC ±0.1cm	13. Sick in the last 2 weeks?	14. Seek medical treatment for this illness episode?	15. Where did they seek treatment?	16. If they did not access a gov. HF, what is the reason?

[7] This form is translated into Nepalese for the actual survey.

Annex 7: Activity Plan for Jajarkot Survey

Activity Plan for Jajarkot Survey										
		Date 2008 December-Jan 2009								
		December (week)					January			
S.N.	Activities detail	1st W	2nd W	3rd W	4th W		1st W	2nd W	3rd W	4th W
1	|Meeting with Concern for detail planning									
2	Materials preparation (Revision the given questionnaire)									
3	Consultant and group moving to Jajarkot									
4	Training for enumerators (3 days)									
5	District meeting with DHO/PHO and Nut. Focal person									
6	Hiring local enumerators at district									
7	Field move for data collection									
8	Return to KTM (all questions + coding +official management									
9	Data processing analysis									
10	Report writing									
11	Presentation of preliminary findings									
12	Feedback for report and final submission for report									
13	**Note: 1st draft report was submitted on 15th of February 2009**[8]									

[8] Final report was completed by 8th of May, 2009