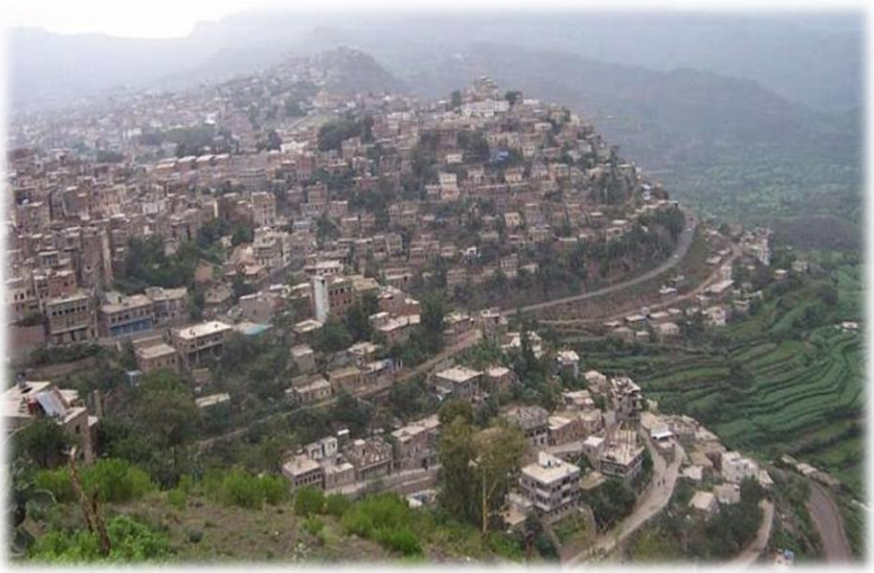

NUTRITION SURVEY Report

EASTERN AND WESTERN HIGHLANDS

Ibb GOVERNORATE, YEMEN

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EUROPEAN COMMISSION

Humanitarian Aid and Civil Protection

Ministry of Public Health and Population (MoPHP)
United Nations Children's Fund (UNICEF)

NUTRITION SURVEY REPORT

Ibb GOVERNORATE, YEMEN

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Conducted 24 November to 6 December 2012

unicef

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EXECUTIVE SUMMARY

Ibb Governorate is the the most densely populated governorate in Yemen, with an estimated 2,131,861 inhabitants in 2004. The governorate contains of two main ecological zones / livelihood groups: the Eastern Highlands and the Western Highlands.

Ibb is famous for its wet weather and high rainfall average, which earned it the nickname “the fertile province”. Abundance of water encouraged farmers to cultivate the whole governorate despite the difficult mountains and steep terrains and considered the major sources of food for most people outside Ibb city. Crops grown on the rich volcanic soil include grains (wheat, barley, and millet), fruits and vegetables, coffee, and Qat. Livestock, mainly sheep, are extensively grazed.

The ongoing increase in the price of the main food commodities has reduced the purchasing power particularly of the poorest and most severely food insecure families in Yemen. The 2012 WFP-CFSS survey reported the moderate and severe food insecurity of 54.5 per cent estimating that 1,366,436 of Ibb population are food insecure. The earlier estimate for Ibb Governorate by IFPRI, 2010 was GAM rate of 6.1 per cent, SAM of 0.4 per cent, underweight prevalence of 45.9, and stunting prevalence of 66.8 per cent. However, recently WFP reported higher figures for GAM (10.1%) and SAM (2.8%) but lower figures for underweight (33.0%) and stunting (50.1%).

In view of these circumstances, as well as high global food insecurity and water stress, in addition to the lack of baseline data on the nutrition situation and poor reporting/information system, it has been deemed crucial to obtain a better understanding of the nutrition situation of the governorates' population. Ibb was prioritized since half of its population is living in the Western Highlands where high prevalence of acute malnutrition is expected. This predication is made based on data collected from Hodeidah and Taiz that have both boarders and similar livelihood and conditions and aggregative factors to that of Ibb.

Between 24 November and 6 December 2012, MoPHP and UNICEF conducted two inter-agency nutrition surveys using the Standardized Monitoring and Assessment for Relief and Transition (SMART) methodology covering the two main ecological zones in Ibb Governorate of Yemen. This was a Yemen Nutrition Cluster initiative to establish and monitor the levels of acute malnutrition, stunting and underweight among children aged 6-59 months in the different livelihood/ ecological zones, identify some of the factors associated with malnutrition, and inform on the appropriate responses.

Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 30 clusters in Eastern Highlands and 30 clusters in Western Highlands were randomly selected for both anthropometric and mortality assessments. The calculated sample sizes in Eastern and Western Highlands using ENA for SMART software were 729 and 816 households respectively. The calculated sample for death estimation purpose using parameters of estimated death of 0.21 per 10000 per day and desired precision of 0.15 per 10000 per day in a recall period of 90 days resulted in a sample size of 931 and 1065 households in Eastern and Western Highlands respectively. Therefore, numbers of households decided for Eastern and Western Highlands were 21 and 23 households respectively, with additional number of 5 and 7 households to complete the requested number for mortality assessment form.

The nutritional situation in the two zones is shown in table 1 below. The Global Acute Malnutrition (GAM) rate was **7.6 per cent** (95% CI: 6.0 – 9.7), with Severe Acute Malnutrition (SAM) 1.2 per cent (95% CI: 0.7 – 2.2) in Eastern Highlands. GAM and SAM rates in the Western Highlands were **8.6 per cent** (95% CI: 6.7 – 11.0) and 0.9 per cent (95% CI: 0.4 – 1.9), respectively. ***According to WHO categorization, these rates indicate that the nutrition situation in Ibb is poor which equal to GAM rates between 5 - 9.9 per cent***. Moreover, pockets of high vulnerability were identified in the two zones.

Stunting rates in the Eastern Highlands and Western Highlands are **55.7 per cent** (95% CI: 48.7 – 62.4) and **58.4 per cent** (95% CI: 52.2 – 46.4) respectively with severe stunting of 24.4 per cent (95% CI: 19.7 – 29.9) and 25.8 per cent (95% CI: 21.5 – 30.8) respectively. ***These rates are beyond the critical levels of 40 per cent; thus the stunting rates are of great concern***.

Underweight rate in the Eastern Highlands is **35.6 per cent** (95% CI: 31.1 – 40.5), with severe underweight of 9.7 per cent (95% CI: 7.4 – 12.5) while the underweight and severe underweight rates in the Western Highlands are **38.7 per cent** (95% CI: 33.2 – 44.5) and 9.7 per cent (95% CI: 7.4– 12.5), respectively. ***These rates are above the critical levels of 30 per cent, as per WHO categorization***.

The two main sources of drinking water in the Eastern Highlands were House-connected piped water (39.3 per cent) and water from protected open well (17.2 per cent) while in the Western Highlands they were House-connected piped water (32.5 per cent) and Water from covered rainwater harvesting tank (11.7 per cent). Around 79.0 per cent of the both zones population seeks health services from a public health facility when sick. There was high prevalence of common disease as shown in table 1 below. (. Vitamin A coverage was much lower than the Sphere Standards recommendation of 95 per cent coverage (Eastern Highlands – 25.6 per cent; Western Highlands – 26.9 per cent). Furthermore, 80.6 per cent of the children aged 9-59 months in Eastern Highlands immunized against measles compared to only 73.6 per cent in Western Highlands.

A significant proportion of children (85 per cent) do not receive the recommended number of meals (4 meals and above), as per UN-FAO recommendations. The number of feeds (other than breastfeeds) shows no effect on levels of stunting, GAM and SAM; however higher level of underweight was noted among those fed no or less than four meals per day than those having four feeds and above (34.5% vs. 24.3%, X^2 4.1, P<0.05, df 1). Regarding vaccination, although GAM and SAM was not associated with the third dose of polio vaccination, children who receive it have lower underweight prevalence (34.9% vs. 42.4%, X^2 9.3, P<0.01, df 1). Similarly, the prevalence of stunting is significantly higher among those who did not receive polio vaccination (63.2% vs. 54.3%, X^2 12.6, P<0.0001, df 1). Having no measles vaccination is significantly associated with higher prevalence of stunting (67.2% vs. 55.4%, X^2 17.5, P<0.0001, df 1) and underweight (43.1% vs. 36.0%, X^2 6.6, P<0.05, df 1). Furthermore, almost all types of morbidities found to be significantly higher among non-vaccinated children as shown on table which necessitates fostering EPI program fixed and outreach services.

Diarrhea surprisingly found not be associated with wasting, stunting, or underweight but ARI was significantly associated with stunting (59.2% vs. 53.8%, X^2 6.0, P<0.05, df 1), and underweight (54.3% vs. 33.6%m X^2 9.0, P<0.01, df 1). Furthermore, underweight prevalence found to be higher among those who had measles during last month (60% vs.

36.7%, X^2: 5.8, P<0.05, df 1) as well as the stunting (88.0% vs. 56.2%, X^2: 10.2, P<0.01, df 1). The resulting nutritional deficiency causes impaired immunity and increased vulnerability to more infection may be resulting in a vicious cycle of infection and malnutrition.

Illiterate mothers' children found to have significantly higher prevalence of stunting (60.0% vs. 47.6%, X^2 27.0, P<0.0001, df 1) and higher prevalence of underweight (39.1% vs. 31.8%, X^2 9.0, P<0.01, df 1). Additionally, mother's education found to be significantly associated with ARI (52.1% vs. 46.7%, X^2 4.7, P<0.05, df 1), and fever (62.6% vs. 54.1%, X^2 12.3, P<0.0001, df 1). Therefore, a focus on girls' education is necessary in the long term battle against malnutrition.

WASH found to be an important factor related to both morbidities as well malnutrition. Diarrhea found to be significantly higher among households not using clean storage for drinking water (42.6% vs.37.6%, X^2 5.0, P<0.05, df 1). Although, there is no significant association found between not using clean storage for drinking water and GAM or SAM, there is a highly significant association between not using clean storage and underweight (43.8% vs.33.0%, X^2 23.1, P<0.0001, df 1) as well as stunting (64.5% vs.51.8%, X^2 30.4, P<0.0001, df 1). Having no flush/pour flush latrine found to be strong associated with diarrhea (47.3% vs.35.4%, X^2 26.8, P<0.0001, df 1), with GAM (10.5% vs. 7.2%, X^2 6.1, P<0.05, df 1), underweight (44.8% vs. 32.9%, X^2 27.4, P<0.0001, df 1), and stunting (61.8% vs. 53.8%): X^2: 11.7, P<0.01, df 1).

The household caretaker handwashing practice (e.g. hand washing: after toilet, before cooking, before feeding child, and after disposal of child's faces) showed important associations with diarrhea. Furthermore, lack of soap found to be associated with higher diarrhea prevalence. More importantly, water availability for hand washing, soap availability for hand washing is significantly associated with GAM and underweight. Hand washing after toile and before feeding child also significantly associated with stunting. This implies that these factors may be contributing to the poor nutrition situation in Ibb, hence the need to address them in the intervention package.

Finally, food insecurity indicators found to be high in Ibb governorate (e.g. 41% reduce the size of meals, 17.7% reduce the number of meals, 19.3% slept hungry etc.). This confirm previous reports that Ibb is one of the five governorates that have the highest numbers of food insecure households with severe hunger. Food security also were more in rural than urban areas which support previous findings that rural-urban inequalities are high in Yemen and the number of food insecure people living in rural areas is more than five times higher than in urban areas. Furthermore, Western Highlands were found to have significantly higher percentage and more vulnerable than Eastern Highlands on different indicators e.g. reducing the size of meals because of the scarcity of resources (46.3% vs. 30.3%, X2 49.7, P<0.0001, df 1), member go the bed in night hungry because of not enough food (25.1% vs. 10.7%, X2 92.7, P<0.0001, df 1) respectively. Food insecurity found to be significantly associated with stunting i.e. the prevalence of stunting is higher among those who reduce meals size than those who did not (62.7% vs.52.5%, X2 20.4, P<0.0001, df 1), those reduce males' number (64.4% vs.55.1%, X2 10.1, P<0.01, df 1), slept hungry (61.7% vs.55.7%, X2 4.5, P<0.05, df 1), borrow

food/money to purchase food or purchase food in credit (61.2% vs.48.5%, X2 29.6, P<0.0001, df 1), reduce expenditure on education or health to save money to purchase food (61.0% vs.55.6%, X2 3.9, P=0.05, df 1) respectively. Similarly, food insecurity found to be significantly associated with underweight i.e. the prevalence of underweight is higher among those reduce males' size (43.1% vs.33.1%, X2 20.4, P<0.0001, df 1), reduce males' number (44.9% vs.35.6%, X2 10.6, P<0.01, df 1), reduce expenditure on education or health to save money to purchase food (41.1% vs.36.1%, X2 4.3, P<0.05, df 1), borrow food/money to purchase food or purchase food in credit (41.2% vs.30.1%, X2 23.6, P<0.0001, df 1), reduce expenditure on education or health to save money to purchase food (41.1% vs.36.1%, X2 4.3, P<0.05, df 1) respectively. Only the prevalence of GAM found to be higher among those who slept hungry (11.1% vs.7.8%, X2 4.2, P<0.05, df 1) and SAM found to be higher among those who reduce expenditure on education or health to save money to purchase food (2.4% vs.1.1%, X2 3.9, P=0.05, df 1).

Specific recommendations include:

Immediate Interventions

- Develop detailed integrated response micro-plan articulating district level humanitarian needs, delivering response package, coverage and gaps to document the progress, advocacy and lessons learnt.
- Priority should be given to pockets of vulnerability in both zones through mobilizing outreach services to rapidly address the high GAM/SAM rates.
- Development of CMAM protocol, strengthen and expanding CMAM services to reach all the existed health facilities and outreach services.
- CMAM services should adhere to the CMAM protocol (ensuring systematic treatment and full consideration of moderate acute malnutrition management) that should be integrated with infant feeding, hygiene promotion and food security interventions.
- to promote appropriate IYCF practices (early initiation of breastfeeding, exclusive and sustained breastfeeding for 2 years and promotion of appropriate complementary feeding practices for children aged 6 to 24 months) along with micronutrient supplementations and deworming.
- Accelerate the integration of IYCF counseling into all CMAM services delivered by both fixed and mobile clinics.
- Intensive social mobilisation campaigns on IYCF feeding and caring practices through behavior change / communication interventions mainly in the following areas; timely introduction of complementary food and continue breastfeeding up to two years, along with Vit. A supplementation, micronutrient supplements, and promotion of safe sanitation and hygienic practices including hand washing with soap as well as safe disposal of children’s excreta, diarrhoea prevention measures and appropriate management of ARI among young children

Medium Term Interventions

- From the development point of view, there is an essential need for Yemen to be an active member in the global SUN movement.

- High level advocacy with the GOY and politicians to mobilise their commitment to fight undernutrition among U5 Yemeni children.
- Scaling up implementation of the national nutrition strategy and related action to address the high level of malnutrition in line with the lifecycle approach along with promotion of maternal nutrition.
- Continued support for longer term water development and sanitation programmes throughout the governorate, with community mobilization activities to promote safe sanitation and hygienic practices.
- Follow up SMART nutrition survey and coverage survey in 2013 to track the progress on implementation of the response plan.
- Exploring new initiatives to promote small scale income generating projects, draw lessons learnt and replicate the successful projects.
- Promote improved latrine use and other hygiene services like Community Led Total Sanitation (CLTS) strategy.

Other Recommendations

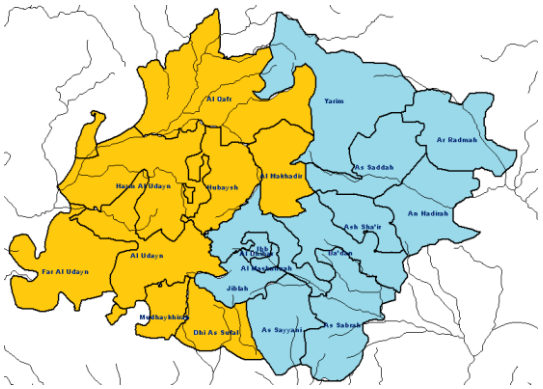
- Further investigation is needed to understand the causality tree behind high level of acute malnutrition among boys compared to girls found in this survey as well as earlier surveys conducted in Hodeidah, Taiz, Hajja governorates.
- Undertaking full scale national nutrition and mortality survey.
- In a view of high malnutrition among illiterate mothers' children found in this as well as previous surveys in Yemen, a focus on girls' education is necessary in the long term battle against malnutrition.

Table 1. Summary of Ibb Governorate Nutrition Survey Findings, December 2012

Indicator	*Eastern Highlands (N=996)*			*Western Highlands (N=999)*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*
I- Child Malnutrition						
Total number of households assessed for children	848	100		885	100	
Mean household size	7.41			7.37		
Total number of children assessed	996			1015		
Child sex: Males (boys)	516	51.8		480	47.3	
Females (girls)	480	48.2		535	52.7	
Global Acute Malnutrition (WHZ<-2 z-score or oedema)	74	7.6	6.0-9.7	86	8.6	6.7-11.0
Severe Acute Malnutrition (WHZ<-3 z score or oedema)	12	1.2	0.7-2.2	9	0.9	0.4-1.9
Oedema	0	0		0	0	
Chronic Malnutrition (H/A<-2 z score)	529	55.7	48.7-62.4	561	58.4	52.2-64.4
Severe Chronic Malnutrition (H/A<-3 Z score)	232	24.4	19.7-29.9	248	25.8	21.5-30.8
Underweight prevalence (W/A<-2 Z score)	347	35.6	31.1-40.5	387	38.7	33.2-44.5
Severe Underweight (W/A<-3 z score)	94	9.7	7.4-12.5	102	10.2	7.9-13.1
II- Child Morbidity						
Children reported with suspected measles within one month prior to assessment	8	0.8	0.3-1.4	19	1.9	1.1-2.8
Children reported with diarrhoea in 2 weeks prior to assessment	388	39.0	35.8-42.1	403	40	37.0-43.0
Children reported with ARI within two weeks prior to assessment	522	52.4	49.4-55.5	485	47.9	44.9-50.8
Children reported with febrile illness in 2 weeks prior to assessment	599	60.3	57.4-63.2	605	59.8	56.5-62.6
III- Immunization and Supplementation Status						
Children aged 9 – 59 months immunised against measles	754	80.6	78.1-83.1	666	73.6	70.6-76.6
Children who have received 3 doses of polio vaccine	771	77.6	74.8-80.2	674	67.5	64.7-70.4
Children reported to have received vitamin A supplementation in last 6 months	255	25.6	23.0-28.5	263	26.9	24.0-29.7
III- Child Feeding						
Children (6-24 months) reported to be breastfeeding	217	66.6	61.6-71.3	236	68.0	63.1-73.0
Children (6-24 months) fed 4 times and above	44	13.3	9.9-17.5	64	18.4	14.4-22.5
IV- Salt iodization						
Households consumes adequately iodized salt	144	17.1	14.5-19.6	88	10.0	8.0-12.1
V- Mortality						
0-5 Death Rate (U5DR) as deaths/10,000/ day	0.42		0.15-1.18	0.49		0.24-0.97
Crude Death Rate (CDR) as deaths/10,000/ day	0.16		0.09-0.28	0.19		0.12-0.29

1.0 INTRODUCTION / BACKGROUND

Figure (1): Ibb map



Ibb is a governorate of Yemen that is located in the south inland of the country with Taiz Governorate to the southwest, AdDali' Governorate to the southeast, Dhamar Governorate to the north, and short borders with Al Bayda' Governorate to the east and Al Hudaydah Governorate to the west (Fig 1). It has an area of 5,344 km² and a population estimated at around 2,131,861 in 2004, making it the most densely populated governorate in Yemen.

The province contains many attractions in districts such as Yareem, Ba'dan and Al-Sabrah. Ibb is located on the southwestern side of the escarpment of the Yemeni Highlands, with dramatic drops to Ta'izz city and the Tihama coastline. There are also impressive views of 3,070 meter high Jebel Sabir to the south.

Its capital is Ibb, which, along with Jibla, are extremely significant historic cities. The city is one of the most picturesque in Yemen; it is surrounded by a thick wall, inset with tall houses.

Administratively Ibb is 20 districts: Al Dhihar District, Al Makhadir District, Al Mashannah District, Al Qafr District (the largest district), Al Udayn District, Al Nadirah District, Ar Radmah District, As Sabrah District, As Saddah District, As Sayyani District, Ash Sha'ir District (the smallest district), Ba'dan District, Dhi As Sufal District, Far Al Udayn District, Hazm Al Udayn District, Hubaysh District, Ibb District, Jiblah District, Mudhaykhirah District, Yarim District.

Ibb Governorate is contains two ecological zones , the Western Highlands and Eastern Highlands. Ibb has the largest Yemeni expatriates abroad distributed in Saudi Arabia; about 500,000 (mainly from Hubaysh, Hazm Al Udayn, Far Al Udaynetc.) and USA; about 200,000 (mainly from Alaod, Baadan, Alshaer, and Alsabrah).

Climate and rains

Ibb is famous for its wet weather and high rainfall average, which earned it the nickname “the fertile province”. Abundance of water encouraged farmers to cultivate the whole governorate despite the difficult mountains and steep terrains and considered the major sources of food for most people outside Ibb city. Crops grown on the rich volcanic soil include grains (wheat, barley, and millet), fruits and vegetables, coffee, and Qat. Livestock, mainly sheep, are extensively grazed.

Socio-political situation

In recent years, Ibb governorate has been the scene of numerous sit-ins in protest at government policies and many of the most significant anti-government protesters have been natives of Ibb and surrounding areas.

In 2010, the IFPRI National Food Security Paper estimated Global Acute Malnutrition rate based on HBS 2005-06 data in Ibb to be 6.1 per cent, with Severe Acute Malnutrition at 0.4 per cent. The underweight and stunting prevalence were 35.0 per cent and 79.5 per cent respectively. Furthermore, A study jointly carried out by the MOPIC and JICA (MoPHP & JICA 2009) reveals that more than 70 percent of the children in Ibb are anaemic[1].

WFP Yemen – Secondary Data Analysis on Food Security and Vulnerability 2009, revealed prevalence of 5.8% and 66.8 for wasting and stunting based on HBS 2005/06[2]. The CFSS, 2010[3] that among U5 children 2.8% were severe malnourished (MUAC<11.5 cm) and 8.9% are malnourished (MUAC <12.5cm). Among women between 15 and 49 years 14.3% were severely malnourished (MUAC <21.4cm) and 20.9% are malnourished (MUAC <22.2cm). The 2012 WFP-CFSS survey[4] reported the moderate and severe food insecurity of 54.5 per cent estimating that 1,366,436 of Ibb population are food insecure. Furthermore, WFP-CFSS survey reported higher acute malnutrition (GAM: 10.1%, and SAM: 2.8%) but lower figures for underweight (33.0%) and stunting (50.1%). According to Nutrition cluster strategy 2012/Yemen[5], Ibb fall within the serious zone (GAM from 10 – 14.9%).

[1] MoPIC and IFPRI. National Food Security Strategy Paper (NFSSP). Final Draft, February 2010
[2] WFP. Yemen – Secondary Data Analysis on Food Security and Vulnerability, 2009
[3] WFP. Comprehensive Food Security Survey, Yemen. March 2010
[4] WFP. Comprehensive Food Security Survey, Yemen. March 2012 WFP (2012). The State of Food Security and Nutrition in Yemen. Summary and Overview

[5] Nutrition cluster strategy 2012/ Yemen

2.0 ASSESSMENT OBJECTIVES

The overall objective of the two SMART surveys was to establish the nutrition situation in Ibb Governorate, determine some of the factors influencing malnutrition, and identify some of the public health services accessible to the Ibb population.

Specific objectives were:

1. To estimate the level of acute malnutrition (wasting), stunting and underweight among children aged 6-59 months in the Eastern and Western Ecological Highlands of Ibb Governorate.
2. To identify factors influencing nutrition status of the children in the two ecological Highlands of Ibb including disease prevalence and access to essential services.
3. To estimate the prevalence of some common diseases (measles, diarrhoea, fever and ARI) in the two ecological Highlands of Ibb.
4. To estimate the measles and polio vaccination and Vitamin A supplementation coverage among children in the two ecological Highlands of Ibb.
5. To estimate the crude and under-five mortality/death rates in the two ecological Highlands of Ibb Governorate.

3.0 METHODOLOGY

3.1: Sampling Design and Sample Size Determination

Two cross-sectional surveys were conducted between 24 November to 6 December 2012 in the Ibb Governorate's Eastern and Western Ecological Highlands. Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 36 clusters in the Eastern Highlands and 36 clusters in Westerns Zone were randomly selected for both anthropometric and mortality assessments. The cluster sampling methodology was selected in view of lack of an exhaustive updated list of household details and accurate demographic characteristic by village; only population estimate at village level was available. The total estimated population in the Eastern Highlands was 1,534,422 while the total estimated population in Western Highlands was 1,069,933 (Ref: Annexes 9 and 10: Sampling Frame: Source: CSO Projection, 2012).

From the 20 districts, 12 districts were put in the Eastern stratum; they are: Al Dhihar, Al Mashannah, Al Nadirah, Al Sabrah, Ash Sha'ir, Al Radmah, As Saddah, As Sayyani, Al Saddah, Ba'dan, Yari, Jiblah, and Ibb. The other eight districts were put in the Western stratum; they are: Al Makhadir, Al Udayn, Far Al Udayn, Hazm Al Udayn, Al Qafrm Dhi As Sufal, Hubaysh, and Mudhaykhirah districts.

Table 2: Parameters used in the Sample Size Determination

Parameters	Eastern Highlands Survey	Western Highlands Survey
Estimated Acute Malnutrition Prevalence (%)	**10.1**	**10.1**
Desired Precision (%)	**2.5**	**2.5**
Design Effect[6]	**1.5**	**1.5**
Average Household Size[7]	**7.2**	**6.3**
Under 5 year old (%)[8]	**19.9**	**20.3**
Non response household (%)[9]	**3**	**3**
Sample Size (N)	**729**	**816**

The calculated sample sizes in Eastern and Western Highlands using ENA for SMART software were 729 and 816 households respectively. The calculated sample for death estimation purpose using parameters of estimated death of 0.21 per 10000 per day and desired precision of 0.15 per 10000 per day in a recall period of 90 days resulted in a sample size of 931 and 1065 households in Eastern and Western Highlands respectively. Therefore, numbers of households decided for Eastern and Western Highlands were 21 and 23 households respectively, with additional number of 5 and 7 households to complete the requested number for mortality assessment form.

Based on this, it was decided that 23 households per cluster per day could be visited in the Western Highlands for assessing the anthropometry and mortality; while considering the time needed to travel daily due to the challenging terrain in the Eastern Highlands, it was estimated that a team could visit a maximum of 21 households per cluster per

[6] Minor heterogeneity within clusters in the study population explored based on presence of "marginalized groups"/ non–integrated groups, differences in infrastructural network hence access to services and information, rain dependence vs irrigation farming, livelihood (*Qat* growers vs *Qat* sellers, fishing and farming, etc)

[7] Calculated on basis of Central Statistics office data of population versus households

[8] Estimated on basis of MoH reports and immunization statistics

[9] Non-response rate of 3% was estimated in case the teams encounter refusal, security-related inaccessibility or absence.

day for anthropometry but continue to complete 7 and 5 households for mortality.

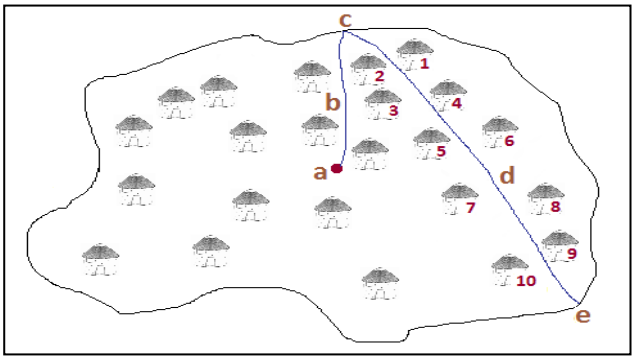
3.2: Sampling Procedure

The ENA for SMART software was used in the random selection of the 36 clusters from the sampling frame, including identification of the reserve clusters. The sampling frame consisted of an exhaustive list of villages or urban area sections known to be accessible within Ibb Governorate and the estimated population size for each of the villages. Independent sampling frames for Eastern and Western Highlands s were used in this selection process (Ref: Sampling frames in Annexes 9 and 10). In this case, all villages in Ibb Governorate were accessible and were included in the sampling frame, thus giving them an equal chance of being selected.

All the 36 clusters randomly selected from the sampling frames for the Eastern and Western Ecological Highlands were accessible and were assessed, hence the reserve clusters were not assessed in the two surveys. Upon reaching the cluster/ villages, the survey teams, with the help of an elder or a village guide, requested the village residents' permission to assess the areas. The purpose of the survey was explained and the process of random selection of a representative sample from the cluster was also elaborated.

Once granted permission to continue with the survey, the survey team used the Modified EPI methodology to randomly pick the household to be interviewed. This involved identifying the centre of the cluster/ village, where they had to spin a pen to randomly select the direction to take to the edge/periphery of the village. The team walked to the edge of the cluster/ village. From the edge of the village, the team had to spin the pen again aiming to randomly get a direction to follow to the other extreme edge of the village. In case the pen pointed towards outside of the village, the teams were to spin the pen multiple times till the pen pointed to any of the directions towards the village. Once a new direction was obtained, the team counted all the households along the randomly selected direction, gave each household a number, and then randomly selected the first household to be interviewed from the numbered households (for example, household number 7 in the households numbered 1 to 10, in the figure (2)).

Figure (2): The modified EPI method used for selection of households



Same direction was followed to select the subsequent household for interview, going for next nearest household on the right side and following the selected direction, until the required minimum number of households and children had been assessed (Ref: Figure (2) indicating the household selection process– Figure adopted from the SMART Methodology Guideline). Anthropometric data alongside other child data were collected from all children aged 6-59 months found in the randomly selected household.

In case the team assessed all households to the edge of the village and did not reach the required number of households, the team would repeat the process again i.e. start from the cluster/ village centre to randomly select another direction, then walk to the edge, then spin the pen again and count the households to the edge of the cluster.

Then randomly pick the first household for interview, and then go the next nearest household, to the right hand side, till the required number of households were interviewed.

In case of absence of the children during the interview time or absence of the members of the randomly selected households, an appointment was made by the survey team to return back before leaving the cluster.

3.3: Study Population and Data Collection Process

As defined in the sampling frame, the study population was the entire population of Ibb Governorate as defined based on the two ecological Highlands – the Eastern and the Western.

The activities undertaken in the entire survey period are summarised in Table 3, below. Data collection preparation commenced with a four-day training of enumerators, team leaders and supervisors (Ref: Annex 3: Ibb Nutrition Survey Team). The training conducted covered interview techniques, sampling procedures, field procedures (random household selection, introduction and systematic data collection), inclusion and exclusion criteria, sources and reduction of errors, taking of measurements (height, weight and MUAC) focusing on achieving high precision and accuracy, data collection standardisation procedures to ensure data quality, diagnosis of oedema, measles, ARI, diarrhoea and collection of household details necessary to establish household members movement and/or death in order to compute mortality rates, handling of equipment and the general courtesy during the assessment. Six survey teams were involved in the data collection process.

Quantitative data were collected by means of a household questionnaire for nutrition survey and a mortality survey question, adopted from the SMART Methodology guidelines (Ref: Annex 1: Ibb Nutrition Survey Questionnaire and Annex 2: Ibb Mortality Survey Questionnaire). Only children aged 6-59 month were included in the measurement of height, weight and MUAC. The age estimation was based on birth or immunization card details and/or supported with events calendar and date conversion tables based on the Islamic Calendar (Ref: Annex 5 and 6: Age Conversion Tables and Events Calendar).

Retrospective mortality data were collected from all randomly selected households, irrespective of presence or absence of children aged 6-59 months. A recall period of 90 days prior to the survey was used.

Table 3: Chronology of Activities in the Ibb Governorate Survey

Action	Period
Preparation: Contacting local authority, survey team identification, training material preparation	10 – 14 Nov 2012
Training of survey teams and pre-testing of questionnaire	17 – 22 Nov 2012
Ibb Western Highlands survey: Data collection and data entry	24 – 29 Nov 2012
Ibb Western Highlands : Data cleaning and analysis	1 – 3 Dec 2012
Ibb Eastern Highlands : Data collection and data entry	1 – 6 Dec 2012
Ibb Eastern Highlands : Data cleaning and analysis	8 – 12 Dec 2012

Ibb Nutrition Survey report drafting and releasing	16 January 2013
Circulation of final report	

3.4: Measurement Standardization and Quality Control

Seven survey teams (one team as a reserve) underwent rigorous standardisation test procedures using 10 children aged 6 - 59 months. This exercise was conducted at training place in the training venue of Maternal and Childhood Hospital in Ibb Governorate and it aimed at assessing the accuracy and precision of the survey teams for purposes of enhancing the survey data quality. The weak team members were identified and the common mistakes made were identified and addressed (Ref: Annex 4: Ibb Nutrition Survey Standardization Test Report, showing team performance and how errors were rectified/addressed). Further field testing of survey tools and exercise on data collection, including household selection and interview steps and familiarization of questions was conducted, and field level challenges and common mistakes identified and discussed. The field testing was conducted in Al-Masha'eba village in district of Ibb This village was not one of the randomly selected villages/clusters.

Beside training, which also included role playing and field testing, data quality was also ensured through (i) Monitoring of fieldwork by coordination team; (ii) Crosschecking of filled questionnaires on a daily basis, recording of observations and daily de-briefing and discussion; (iii) Confirmation of measles, severe malnutrition especially oedema cases and death cases by supervisors; (iv) Daily entry of anthropometric data, continuous data cleaning and plausibility checks, plus ensuring each team was given feedback on the quality of previous day's data before the start of a new day; (v) Equipment calibration/ monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights to check for any differences, (vi) Additional check was done at the data entry level to enable entry only of relevant possible responses and measurements; (vii) Continuous reinforcement of good practices. During the field data collection, all measurements were loudly called by both the enumerators reading and recording them, to reduce errors during recording.

Clear job descriptions were provided to the teams as part of the training, to ensure appropriate guidance in delivering the assigned tasks (Annex 11: Survey Team Job Description). The supervisor had to review the questionnaire and verify the accuracy of the details before the teams leave a household, thus minimizing possibility of incomplete data (missing variables) and outliers.

3.5: Data Entry and Analysis

The anthropometric data were entered and analysed using ENA for SMART software, while the remaining household variables and child-related variables (feeding practices and morbidity) were entered and analysed using Epi info ENA version 3.5.3. Running and tabulation of all variable frequencies was carried out as part of data cleaning. The nutrition indices (z-scores) for Weight for Height (wasting), Height for Age (stunting) and Weight for Age (underweight) were generated and compared with WHO 2006 Growth Standards. Children/cases with extreme z-score values were flagged and investigated and appropriately excluded in the final analysis if deviating from the observed mean (SMART flags).

The classification used for wasting levels was a follows:

W/H < -3 Z-Scores or oedema = Severe acute malnutrition
W/H ≥ -3 Z-Scores < -2 Z-Scores = Moderate acute malnutrition
W/H < -2 Z-score or oedema = Global/total acute malnutrition
W/H ≥ -2Z-Scores = Normal

The classification used for Stunting levels was a follows:

H/A < -3 Z-Scores = Severe stunting
H/A ≥ -3 Z-Scores < -2 Z-Scores = Moderate stunting
H/A < -2 Z-score = Stunting Prevalence rates
H/A ≥ -2Z-Scores = Normal

The classification used for Underweight levels was a follows:

W/A < -3 Z-Scores = Severe Underweight
W/A ≥ -3 Z-Scores < -2 Z-Scores = Moderate underweight
W/A < -2 Z-score = Underweight Prevalence Rates
W/A ≥ -2Z-Scores = Normal

Frequencies and cross-tabulations were used to give percentages, means and standard deviations in the descriptive analysis and presentation of general household and child characteristics.

Mortality data were entered into the individual level sheet of ENA software and analysed immediately.

3.6: Data Entry Verification and Cleaning

Four team members shared the work of data entry, and then each member would review the work done by another colleague before merging the data on a daily basis.

About 10 per cent of the entered questionnaires were randomly drawn using the Random Number Table of ENA software. These drawn questionnaires were revised for accuracy of entry in the electronic database. The quality of data entry was accepted if accuracy was not less than 95 per cent.

The uniqueness of IDs of both household questionnaire and mortality sheet was also reviewed for any repeating during data entry.

For anthropometry data, all flagged records were also reviewed by means of revisiting original questionnaires.

4.0 ASSESSMENT RESULTS

4.1: Household Characteristics of Study Population

As shown in Table 4 below, the gender of household head is largely male (over 95 per cent). 89.8 per cent and 87.5 per cent of household heads are married and living with partner in Eastern and Western Highlands s respectively. Those who are married but living far from spouse for ≥ 6 months is higher in Western Highlands (7.3%) compared to the Eastern Highlands (4.6%) which go with the fact that Western Highlands (mainly from Hobaeesh, Al-Odaeen, Hasm Alodaeen, Fara'a Alodaeen etc.) has the larger Yemeni expatriates abroad distributed in Saudi Arabia (around 500,000); than Eastern Highlands who are mainly in USA (around 200,000) who are mainly from Baadan, Alshaer etc. More than two thirds of household caretakers in Eastern Highlands and more than three-fourth in Western Highlands are illiterate, with much lower percentage of those with secondary and higher education (6.8% in Eastern Highlands compared to 4.4% in Western Highlands).

In spite the fact that Ibb is a fertile agricultural region, only 4.5% and 2.4% of the population in Eastern and Western Highlands s respectively lives on crops other than Qat as the main source of income. Instead temporary work/ casual labour[10] is the main source of income for more than one third of the population in both Highlands followed by fixed monthly wages in around one fourth of the population in Eastern Highlands and 15.6% at Western Highlands. Qat cultivation and trade is the main source of income for 10.5% in Eastern Highlands and 12.0% in Western Highlands. Remittances are important source of income in Ibb governorate for 11.2% and 8.2% of Western and Eastern Highlands population which go coincide with the large Ibb expatriates abroad as mentioned above.

In spite the fact that Ibb is a fertile agricultural region, agriculture is not an important source of income for most of the surveyed population

Regarding drinking water (see table 4), the main source for households in both Eastern and Western Highlands s is the House-connected piped water (39.2% and 32.3% respectively) followed by water from protected open well (17.2%) and protected spring (13.7%) in Eastern Highlands and by Water from covered rainwater harvesting tank and water from protected open well (around 11.5) in Western Highlands .

As shown in Table 4, 14.7 per cent of households in Western Highlands reported defecation in open compared to 9.4% in Eastern Highlands. Furthermore, while the main household latrine type for households in Eastern Highlands is flush or pour flush latrine (73.9 per cent) that is found in only 56.1 per cent in Western Highlands.

[10] Temporary work is daily wage based work such as work in construction, on others' farms, etc.

Only 10.0 per cent of households in Western Highlands compared to 17.2% in Eastern Highlands are using adequately iodized salt. Although another 40% and 31.9% at Eastern and Western Highlands respectively are using iodized salt, the amount of iodide found to be inadequate (table 4 below). This indicates that in spite of the household tendency to use iodized salt, there is weakness in the food inspection system on salt monitoring at the market level.

Table 4: Household Characteristics

Indicator	*Eastern Highlands*		*Western Highlands*	
	N	*%*	*N*	*%*
Household members:				
Total Households	848		885	
Mean household size	7.41		7.37	
Mean No of Under-fives	1.31		1.30	
Mean No of 6 – 59 months children	1.18		1.15	
Sex of Household Head:				
Male	806	95.5	856	96.7
Female	38	4.5	29	3.3
Marital status of household head:				
1. Married and living with spouse	758	89.8	774	87.5
2. Married but living far from spouse for ≥ 6 months	39	4.6	65	7.3
3. Widowed	36	4.3	35	4
4. Single	8	0.9	4	0.5
5. Recalcitrant	1	0.1	2	0.2
6. Divorced	2	0.2	5	0.6
Education level of household caretaker:				
1. Illiterate	579	68.6	674	76.2
2. Read and write	171	20.3	134	15.2
3. Basic education	36	4.3	37	4.2
4. Secondary education	40	4.7	32	3.6
5. Higher education	18	2.1	7	0.8
Main Source of Income:				
1. Temporary work/ Casual labour	289	34.2	343	38.8
2. Fixed monthly waged work	201	23.8	138	15.6
3. *Qat* cultivation and trade	89	10.5	106	12.0
4. Remittance	69	8.2	99	11.2
6. Crops other than *Qat*	38	4.5	21	2.4
7. Trade	24	2.8	40	4.5
8. Handmade work	70	8.3	46	5.2
9. Others	64	7.6	92	10.3
Main water source for drinking:				
1. House-connected piped water	332	39.3	287	32.5
2. Water from unprotected open well	36	4.3	25	2.8
3. Water from protected open well	145	17.2	102	11.5
4. Unprotected surface water (wadi, springs, etc.)	72	8.5	88	10.0
5. Protected spring	116	13.7	102	11.5
6. House-connected yard piped water	84	10.0	91	10.3
7. Water from covered rainwater harvesting tank	13	1.5	103	11.7
8. Water tanker	36	4.3	69	7.8
9. Others	10	1.1	21	2.4
Household latrine type:				
1. Flush/pour flush latrine	624	73.9	495	56.1
2. Open pit latrine	53	6.3	189	21.4
3. Simple covered pit latrine	83	9.8	63	7.1
4. Defecation in open (in fields, etc.)	79	9.4	130	14.7
5. Others	5	0.6	6	0.7
Salt type used				
1. Non iodized salt	356	42.6	490	55.9
2. Inadequately iodized salt (below 15 ppm)	336	40.2	280	31.9
3. Adequately iodized salt (15 ppm and above)	144	17.2	88	10.0

4.2: Morbidity, Immunization Status and Health Seeking Behaviour

High prevalence of common diseases was recorded in both the Eastern and Western Highlands, as reflected in Table 5, below. During the two weeks prior to the survey, recorded prevalence of diarrhoea among children was around 40 per cent in both zones. The prevalence of ARI -as described by coughing or breathing difficulty- and the prevalence of fever two weeks prior to the survey were 52.4 per cent and 60.3 per cent in Eastern Highlands compared to 47.9 per cent and 59.8 per cent in Western Highlands respectively.

Suspected measles[11] during the last month was higher in Western Highlands (1.9% per cent) compared to 0.8 per cent only in Eastern Highlands which may go with relatively low measles vaccination coverage in Western Highlands (see below).

As shown in Table 5, only 77.6 per cent of children have been vaccinated the third dose of polio vaccination in Eastern Highlands compared to only 67.5 per cent in Western Highlands. Slightly higher rates were also found for measles vaccination coverage of children aged 9 months to below 60 months with 80.6 per cent in Eastern Highlands and 73.6 per cent in Western Highlands.

Vitamin A supplementation during the previous 6 months was very low with only 25.6 per cent of the children in the Eastern Highlands and 26.9 per cent of the children in the Western Highlands had received it. The above immunization coverage and vitamin A supplementation coverage in both zones are lower than the Sphere Standards recommended 95 per cent coverage.

Very few children slept under a mosquito net the night before the survey however, the percentage is higher in Western Highlands (10.9 per cent) than Eastern Highlands (1.9 per cent) which may be explained by higher prevalence of malaria in Western Highlands (Al-Odaeen, Hasm Alodaeen, Fara'a Alodaeen) which are in border with Hodeidah endemic malaria region.

As shown in Table 5, nearly 80 per cent of households in both Highlands seek health services from public health facilities compared to 10.4 and 5.9 per cent seek private clinics in Eastern and Western Highlands s respectively. Only 1.4 and 0.6 per cent do not seek for medical assistance during illness in Western and Eastern Highlands respectively. The main reasons for seeking medical assistance outside public facilities or private clinics were nearly similar in both zones and are due to the high cost of the service, followed by the physical distance to these services and transportation difficulties.

Table 5: Health Seeking Behaviour

Indicator	*Eastern Highlands*		*Western Highlands*	
	N	*%*	*N*	*%*
Where health service is sought				
Public health facility	670	79.4	691	78.3
Pharmacy	31	3.7	44	5.0
Private clinic	88	10.4	52	5.9
Personal medication	50	5.9	77	8.7
Do not seek medical assistance	5	0.6	12	1.4

[11] The suspected measles is defined as having rash and fever in addition to at least one of: cough, sore throat, or conjunctivitis.

Indicator	*Eastern Highlands*		*Western Highlands*	
	N	*%*	*N*	*%*
Traditional medication	0	0	7	0.8
Morbidity				
Children with diarrhoea within 2 weeks prior to assessment	388	39.0	403	40
Children with ARI within two weeks prior to assessment	522	52.4	485	47.9
Children with fever within two weeks prior to assessment	599	60.3	605	59.8
Suspected measles within one month prior to assessment	8	0.8	19	1.9
Immunization				
Children (9-59 months) immunised against measles	754	80.6	666	73.6
Children who have ever received polio vaccine	771	77.6	674	67.5
Supplementation				
Children who received vitamin A supplementation in last 6 months	255	25.6	263	26.9
Sleeping under mosquito net				
Children slept under mosquito net last night	19	1.9	110	10.9

4.3: Feeding Practices

Table 6: Feeding practices

Indicator	*Eastern Highlands*		*Western Highlands*	
	N	*%*	*N*	*%*
Still breastfeeding	217	66.6	236	68.0
Number of feeds (other than breastfeeds)				
No feed	42	12.7	28	8.1
One feed	13	3.9	28	8.1
Two feeds	66	19.9	78	7.7
Three feeds	166	50.2	149	14.7
Feeding 4 times and above	44	13.3	64	18.4
Number of milk feeds (other than breast milk)				
No milk feed	142	43.8	113	34.0
One milk feed	32	9.9	30	9.0
More than one milk feed	150	46.3	189	57.0

As shown in Table 6, only around two thirds of children aged 6 to 24 months are continuing breastfeeding in both Highlands . Additionally, only 18.4 per cent of this category of children in the Western Highlands and 13.3 per cent in Eastern Highlands had four and above feeds other than breastfeeding in the previous day. Inappropriate infant and young child feeding practice was recorded in the two Highlands with only 56.2 per cent of children over 6 months of age in the Eastern Highlands and 66.0 per cent of children in the Western Highlands were given milk (other than breast milk) in the previous day to the survey.

4.4: WASH

Households' caretakers WASH practices were assessed (table 7). Although both Highlands have poor WASH practices, Eastern Highlands population seems having somewhat some better WASH practices than Western Highlands population e.g. in Eastern Highlands 56.3 mentioned hand washing with water and soap after toilet (compared to 47.9% in Western Highlands), 32.7 per cent before meal (compared to 29.8% in Western Highlands), 34.2 per cent before cooking (compared to 26.6% in Western Highlands). However, some other WASH practices are similarly much poorer vin both zones e.g. washing hand before feeding child (around 6%) and after disposal of child's faces (around 16%). More strikingly it was found that while 80% of Eastern Highlands population use soap for hand washing only 36.0 in Western Highlands are using. Finally, Clean water container (i.e. no algae seen) found to be higher in Eastern than Western Highlands (68.5% vs. 58.6).

Table 7: WASH practices

Indicator	*Eastern Highlands*		*Western Highlands*	
	N	*%*	*N*	*%*
1. Hand washing after toilet	475	56.3	424	47.9
2. Hand washing before meal	276	32.7	264	29.8
3. Hand washing After meal	383	45.4	375	42.4
4. Hand washing before cooking	289	34.2	235	26.6
5. Hand washing before feeding child	43	5.1	56	6.3
6. Hand washing after disposal of child's faces	111	13.2	124	14.0
7. Hand washing after cleaning livestock's place	143	16.9	132	14.9
8. Using water for hand Washing	839	99.4	834	94.3
9. Using soap for hand washing	680	80.6	314	35.6
10. Using ash/leaves/sand for hand washing	4	0.5	8	0.9
11. Water container clean (no algae seen)	578	68.5	517	58.6

4.5: Food security

Three parameters to assess food accessibility and two parameters to assess coping strategies were used in this survey in which all were measuring the practice 30 days prior to the survey. As shown in the table 8 below, around 10.6% of households in Eastern Highlands compared to 25.1% in Western Highlands have members experienced to go to the bed hungry. Furthermore, in both Highlands slightly around two thirds are buying the food on credit or using debts to buy food. In Eastern Highlands above one third (35.3 per cent) of households mentioned none of the above parameters (compared to 26.1 in Western Highlands), 43.4 per cent mentioned one parameter (compared to 21.8% in Western Highlands), 10.6 per cent mentioned two parameters (compared to 20.0% in Western Highlands), 3.9 per cent mentioned three parameters (compared to

21.1% in Western Highlands, 4.1 per cent mentioned four parameters (compared to 11.3% in Western Highlands, and 2.5 per cent mentioned all of the five parameters (compared to 8.7% in Western Highlands. The above figures give an indication that the Western Highlands may have more food insecure households.

Table 8: Food security

Indicator (Over the past 30 days)	***Eastern Highlands***		***Western Highlands***	
	N	*%*	*N*	*%*
1. reduce the size of meals because of the scarcity of resources	356	30.3	409	46.3
2. reduce the number of meals because of the scarcity of resources?	81	9.6	210	23.8
3. did you or any HH member go the bed in night hungry because of not enough food?	90	10.7	222	25.1
4. did the HH borrow food, borrow money to purchase food or purchase food in credit or mortgage only if the reason that HH has not money?	524	62.1	583	66.0
5. did the HH reduce the expenditure on education or health to save money to purchase food?	112	13.3	228	25.9

4.6: Characteristics of the children assessed

Table 9: Eastern Highlands: Age and Sex distribution

Indicator	*Boys*		*Girls*		*Total*		*Ratio*
AGE (months)	*no.*	*%*	*no.*	*%*	*no.*	*%*	*Boy: girl*
6-17	108	48.2	116	51.8	224	22.5	0.9
18-29	137	55.7	109	44.3	246	24.7	1.3
30-41	104	46.2	121	53.8	225	22.6	0.9
42-53	124	55.6	99	44.4	223	22.4	1.3
54-59	43	55.1	35	44.9	78	7.8	1.2
Total	516	51.8	480	48.2	996	100.0	1.1

Table 10: Western Highlands: Age and Sex distribution

Indicator	*Boys*		*Girls*		*Total*		*Ratio*
AGE (months)	*no.*	*%*	*no.*	*%*	*no.*	*%*	*Boy: girl*
6-17	134	50.8	130	49.2	264	26.0	1.0
18-29	135	52.1	124	47.9	259	25.5	1.1
30-41	124	53.2	109	46.8	233	23.0	1.1
42-53	118	59.0	82	41.0	200	19.7	1.4
54-59	24	40.7	35	59.3	59	5.8	0.7
Total	535	52.7	480	47.3	1015	100.0	1.1

Generally there were nearly equal numbers of boys and girls assessed in the two Highlands (overall ratio of 1.1%), implying representativeness of the sample collected during the survey, as shown in Tables 9 & 10.

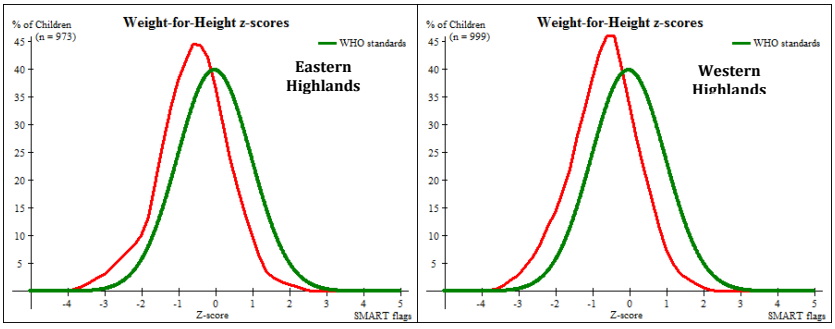
Regarding the age ratio of 6-29 months to 30-59 months (that should be around 1.0) found to be 0.89 and 1.06 in Eastern and Western Highlands respectively.

Furthermore, the overall sex/age distribution in both zone does not significantly differ ($p > 0.05$) which means that the boys and girls are equally represented according to age groups.

4.7: Nutrition Status

Below is a summary of the anthropometric results for both the Eastern and Western Highlands. Data quality was validated using the plausibility check function of the SMART for ENA software. For Eastern Highlands the data quality was good (plausibility data quality scores of 6) and it was acceptable for the Western Highlands (plausibility data quality score of 14) (Ref: Annex 13 for data quality results). The interpretation was made based on the 2006 WHO Growth Standards.

4.6.1: Acute Malnutrition Rates



Though there is an overall shift of the study population to the left when compared with the reference population, as the graphs shown (implying presence of malnutrition), there is a no clear difference in nutrition vulnerability between the two Highlands based on global acute malnutrition

rates. The level of wasting – also known as global acute malnutrition (GAM) – found in Eastern Highlands is **7.6 per cent,** while in the Western Highlands , the GAM rate is **8.6 per cent** as shown in Tables 11 & 12 (including the confidence intervals)**,** which classifies as 'poor' as per the WHO categorization of the malnutrition severity. Although the GAM doesn't significantly differs between the two Highlands , pockets of high nutritional vulnerability were noted in both Highlands. In Western Highlands: Fara'a Alodaeen, Al-qafr and Hasm Alodaeen districts has the highest GAM prevalence (16.6%, 11.4%, 11.1% respectively) while Al-Makhader district has the lowest GAM prevalence (3.4%). Furthermore, while Al-Makhader, Hobaeesh Hasm Alodaeen have zero prevalence of severe acute malnutrition (SAM), Modaeekherah district has the highest (3.3%). Similarly, in Eastern Highlands: Assabrah and addehar has the highest GAM prevalence(15.5%, 12.5% respectively) and the Assadah and Al-Mashanah as the lowest GAM prevalence (2.3% and 2.6% respectively) respectively. Regarding the SAM, while the Geeblah, Assadah, Aradhmah and Yareem have zero prevalence, the Assabrah and addehar (that have the highest GAM) have the highest SAM prevalence (5.2%, 4.4% respectively). There no single oedema case identified in the two Highlands.

Even though, the GAM and SAM prevalence of 8.6 per cent and 1.2 cent that found in the Western and Eastern Highlands respectively, are still lower than the national GAM and SAM of 14.3 and 3.0 per cent[12] levels of 2003 Family Health Survey and the 15.7 and 4.4 per cent 2010 IFPRI estimation based on the 2005-06 HBS. Nevertheless, current figures are higher than earlier GAM and SAM estimates for Ibb Governorate by IFPRI[13] that was of 6.1 per cent and 0.4 per cent respectively.

Table 11 : Ibb Eastern Highlands: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

Indicator	*All n = 973*			*Boys n = 506*			*Girls n = 467*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of global malnutrition (<-2 z-score and/or oedema)	74	7.6	6.0 - 9.7	50	9.9	7.4 - 13.1	24	5.1	3.3 - 7.8
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score	62	6.4	4.9 - 8.3	40	7.9	5.7 - 10.8	22	4.7	3.0 - 7.3
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	12	1.2	0.7 - 2.2	10	2.0	1.1 - 3.6	2	0.4	0.1 - 1.8

Table 12 : Ibb Western Highlands: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

Indicator	*All n = 999*			*Boys n = 526*			*Girls n = 473*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of global malnutrition (<-2 z-score and/or oedema)	86	8.6	6.7 - 11.0	49	9.3	6.9 - 12.4	37	7.8	5.5 - 11.0
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score	77	7.7	5.9 - 10.0	43	8.2	5.9 - 11.3	34	7.2	5.0 - 10.3
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	9	0.9	0.4 - 1.9	6	1.1	0.5 - 2.8	3	0.6	0.2 - 2.0

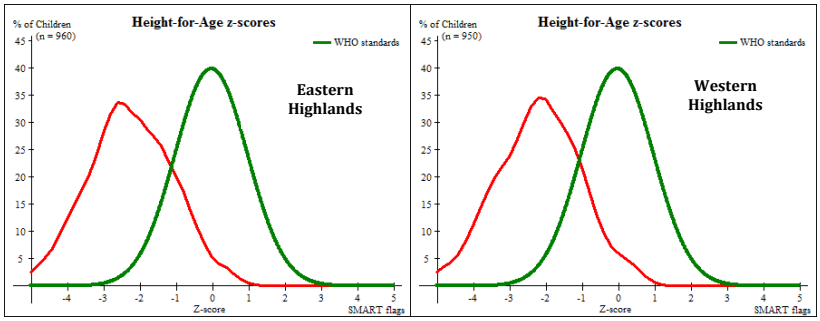
The prevalence of oedema is 0.0 per cent

[12] As interpreted using new WHO Child Growth Standards: Yang H, de Onis M. 'Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards'. BMC Pediatrics 2008, 8:19 (05 May 2008)

[13] MoPIC and IFPRI. National Food Security Strategy Paper (NFSSP). Final Draft, February 2

The prevalence of acute malnutrition based on the NCHS reference is reflected the summary of Table 17 below.

4.6.2: Chronic Malnutrition Rates



Stunting prevalence as shown in Table 13 & 14 in Eastern Zone is 55.7 per cent and is slightly higher in Western Zone with 58.4 per cent. There Is also an overall shift to the left of the study population deviating from the reference population. The prevalence of severe stunting is 24.4 per cent and 25.8 per cent in Eastern and Western Highlands s respectively. The statistical details of the stunting rates are as shown in the tables 11 & 12 below.

These stunting levels exceed the 40 per cent threshold for critical levels according to WHO (2000), therefore the situation is of great concern. The rate for Eastern Highlands is slightly lower than the estimated national stunting levels of 58 per cent (as per 2003 PAPFAM survey), while it is similar in the Western Highlands. However, current figures is lower than the 66.8% per cent stunting prevalence and 48.9 sever stunting prevalence for Ibb Governorate as shown by findings of WFP Secondary Data Analysis on Food Security and Vulnerability [14] estimation based on the 2005-06 HBS.

Table 13: Ibb Eastern Highlands: Prevalence of stunting based on height-for-age z-scores and by sex

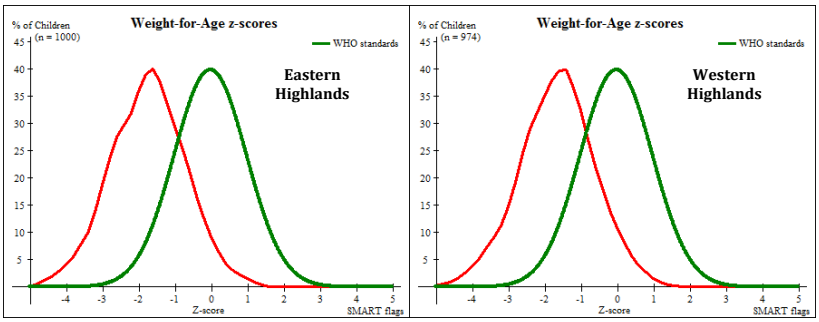
Indicator	*All n = 950*			*Boys n = 493*			*Girls n = 457*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of stunting (H/A<-2 z-score)	529	55.7	48.7 - 62.4	273	55.4	48.4 - 62.1	256	56.0	47.7 - 64.0
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	297	31.3	27.7 - 35.1	154	31.2	26.8 - 36.0	143	31.3	26.5 - 36.5
Prevalence of severe stunting (H/A<-3 z-score)	232	24.4	19.7 - 29.9	119	24.1	18.9 - 30.2	113	24.7	19.0 - 31.5

Table 14: Ibb Western Highlands: Prevalence of stunting based on height-for-age z-scores and by sex

Indicator	*All n = 960*			*Boys n = 500*			*Girls n = 460*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of stunting (H/A<-2 z-score)	561	58.4	52.2 - 64.4	314	62.8	56.2 - 69.0	247	53.7	46.5 - 60.7
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	313	32.6	28.9 - 36.5	179	35.8	31.0 - 40.9	134	29.1	25.0 - 33.6
Prevalence of severe stunting (H/A<-3 z-score)	248	25.8	21.5 - 30.8	135	27.0	22.3 - 32.3	113	24.6	19.2 - 30.8

[14] WFP. YEMEN: Secondary Data Analysis on Food Security and Vulnerability, 2009

4.6.3: Underweight Rates



Regarding underweight, an overall shift of the study population is shown in the graphs, reflecting the overall deviation of the study population from the reference population and implying presence of widespread malnutrition. Underweight prevalence is shown in Tables 15 & 16. The rate is 35.6 per cent in the Eastern Highlands and 38.7 per cent in the Western Highlands. The prevalence of severe underweight is 9.7 per cent and 10.2 per cent in Eastern and Western Highlands respectively.

Table 15: Ibb Eastern Highlands: Prevalence of underweight based on weight-for-age z-scores by sex

Indicator	*All n = 974*			*Boys n = 505*			*Girls n = 469*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of underweight (<-2 z-score)	347	35.6	31.1 - 40.5	184	36.4	31.9 - 41.3	163	34.8	28.9 - 41.2
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	253	26.0	22.5 - 29.8	136	26.9	23.1 - 31.1	117	24.9	20.7 - 29.7
Prevalence of severe underweight (<-3 z-score)	94	9.7	7.4 - 12.5	48	9.5	7.2 - 12.5	46	9.8	6.6 - 14.3

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

Indicator	*All n = 1000*			*Boys n = 525*			*Girls n = 475*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of underweight (<-2 z-score)	387	38.7	33.2 - 44.5	210	40.0	33.5 - 46.8	177	37.3	31.5 - 43.5
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	285	28.5	24.6 - 32.8	155	29.5	24.4 - 35.2	130	27.4	23.6 - 31.5
Prevalence of severe underweight (<-3 z-score)	102	10.2	7.9 - 13.1	55	10.5	7.9 - 13.8	47	9.9	7.1 - 13.7

The above underweight rates exceed the WHO (2000) critical levels of 30 per cent and above. However, these rates for Eastern and Western Highlands are lower than the estimated national underweight levels of 45.6 per cent (as per 2003 PAPFAM survey) and the 45.9 per cent underweight prevalence for Ibb Governorate as shown by findings of IFPRI[15] estimation based on the 2005-06 HBS.

It is worth noting that underweight is a composite variable for Global Acute Malnutrition and Chronic Malnutrition levels in a population.

The following table (Table 17) summarizes the Malnutrition Rates by Ecological Highlands .

[15] MoPIC and IFPRI. National Food Security Strategy Paper (NFSSP). Final Draft, February 2

Table 17: Summary of Malnutrition Rates by Ecological Highlands

Indicator	*Eastern Highlands*			*Western Highlands*		
	N	***%***	***95% CI***	***n***	***%***	***95% CI***
Global Acute Malnutrition (WHZ<-2 or oedema)	74	7.6	6.0 - 9.7	86	8.6	6.7 - 11.0
Severe Acute Malnutrition (WHZ<-3 or oedema)	12	1.2	0.7 - 2.2	9	0.9	0.4 - 1.9
Oedema	0	0		0	0	
Global Acute Malnutrition (WHM<80% or oedema)*	40	4.1	2.9-5.3	42	4.2	3.0-5.7
Severe Acute Malnutrition (WHM<70% or oedema)*	2	0.2	0.0-0.8	0	0.0	0.0-0.0
Stunting rate (HAZ<-2 z score)	529	55.7	48.7 - 62.4	561	58.4	52.2 - 64.4
Severe stunting rate (HAZ <3 z score)	232	24.4	19.7 - 29.9	248	25.8	21.5 - 30.8
Underweight Rates (WAZ<-2 z score)	347	35.6	31.1 - 40.5	387	38.7	33.2 - 44.5
Underweight rate (WAZ_-3 z score)	94	9.7	7.4 - 12.5	102	10.2	7.9 - 13.1

* NCHS reference is used.

4.8: Mortality

Table 18: Mortality data

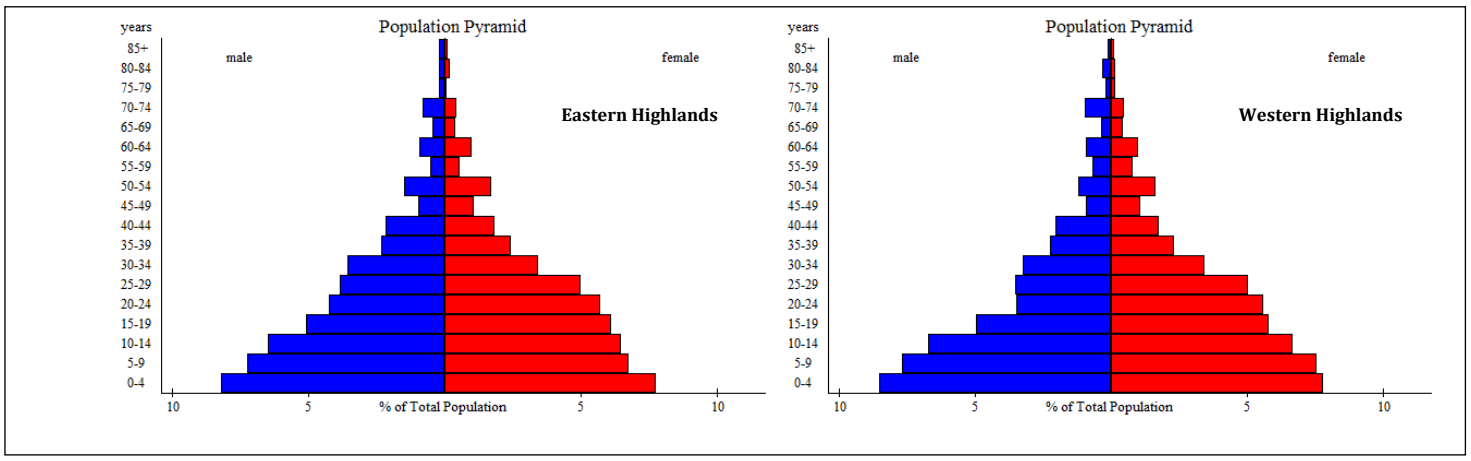
Indicator	*Eastern Highlands*		*Western Highlands*	
	U5	*Total*	*U5*	*Total*
Total HHs surveyed	-	848	-	885
Total Population assessed in HHs	1323	8592	1599	10032
Number who joined the HHs	225	1433	253	1688
Number who left the HHs	204	1562	273	1995
Number of births	70	-	62	-
Number of deaths	5	12	7	17
Mortality rate (per 10,000 per day)				
Under-five	**0.42**		**0.49**	
Crude	**0.16**		**0.19**	

There is no significant differences noted in crude and under-five death rates between the two Highlands. The crude death rate in Eastern Highlands is 0.16 per 10,000 per day, while it is 0.19 per 10,000 per day in Western Highlands. However, the rate is higher among males than females in Eastern Highlands (0.26 and 0.05, respectively) as well as in Western Highlands (0.27 and 0.11, respectively).

The crude death rate in Eastern and Western Highlands are 0.42 and 0.49 per 10,000 per day, respectively. These rates are low and within the acceptable levels according to WHO categorisation, hence not raising concern.

4.9: Population Pyramid

Information about household members during the previous 90 days was collected. The resulting population pyramid for each zone is shown blow. The pyramid is a stage one (expanding) population pyramid where there is high birth rate; high death rate, and short life expectancy. The population distribution by age shows almost equal number of the men and women (0.9 : 1) throughout the age groups.



5.0 DISCUSSION

Levels of acute malnutrition in Ibb Governorate are lower than the national level (15.7 per cent according to IFPRI[16] estimations based on 2005-06 HBS data) and much lower than that recorded in neighbouring Hodeidah governorate[17] (GAM rate of 31.7 per cent). Rates of GAM in Ibb found in this survey are also close to the previously estimated by IFPRI for Ibb[18] (GAM rate 6.1 per cent) and slightly higher for SAM[18]. However, our figures are less than the recent WFP findings of GAM of 10.1%, and SAM of 2.8%[19].

The current GAM rates in both Eastern (7.6%) and Western Highlands (8.5%) are classified as 'poor' according to WHO categorization which equal to GAM rates between 5 - 9.9 per cent. The results indicate poor nutrition situation in the both Highlands based on the acute malnutrition levels, therefore there is a need for emergency response to avert excess mortality due to malnutrition.

Levels of stunting (56.8%) and underweight (36.8%) in Ibb found in this survey are higher than Ibb recent WFP[19] figures for stunting (50.1%), and underweight (33.0%) and above the WHO 'critical' levels thresholds of 40 per cent and 30 per cent respectively.

The stunting rates in both Highlands (above 55%) call for integrated response to reduce the prevalence and the resultant longer-term effect of stunting i.e. children not reaching their full potential in productivity, have poor scholastic achievements; population might record excess mortality etc..

In spite of the slightly higher prevalence of GAM, stunting, and underweight in Western Highlands, such differences are not statistically significant. Furthermore, although GAM did not significantly differs between rural and urban areas (8.4% vs 7.9%), SAM found to be higher in urban areas and reaching the statistical significance (3.0 Vs 1.3, Fisher's Exact Test P =0.05). Furthermore, statistically significant higher prevalence in rural than urban areas were reported for stunting (60.3% vs. 32.8%, X^2: 70.4, P<0.0001, df 1) and for underweight (38.9% vs. 24.2%, X^2 21.5, P<0.0001, df 1).

While there is no significant differences were found in stunting and underweight between boys and girls, boys found to have higher GAM than girls (10.0% vs. 6.4%, X^2 8.4, P<0.01, df 1) as well as higher SAM (2.1% vs. 0.7%, X^2 6.6, P<0.05, df 1).

Regarding the age groups, although GAM and SAM did not differ among children aged 36 and above than younger group, stunting significantly differs (59.5 vs. 54.8, X^2 4.3, P<0.05, df 1) as well as underweight (41.0 vs. 34.6, X^2 8.4, P<0.01) respectively.

[16] MoPIC and IFPRI. National Food Security Strategy Paper (NFSSP). Final Draft, February 2010
[17] UNICEF (2011). Nutrition Survey among U5 Children In Al Hodeidah Governorate, Yemen.

[19] WFP (2012). The State of Food Security and Nutrition in Yemen. Summary and Overview

2012 Comprehensive Food Security Survey

Furthermore, the Western Highlands found to be more vulnerable than the Eastern Highlands regarding not seeking medical assistance, education of household caretaker, income, and access to food and coping strategies.

5.1: Child Feeding, Vitamin A Supplementation and Malnutrition Levels

Among children aged 6 to 24 months, there is no statistically significant differences in wasting, stunting, and underweight between those still breastfed and those who have ceased breastfeeding.

A significant proportion of children (85 per cent) do not receive the recommended number of meals (4 meals and above), as per UN-FAO recommendations. However, this did not differ between both zones, urban and rural residence, or gender. The number of feeds (other than breastfeeds) shows no effect on levels of stunting, GAM and SAM; however higher level of underweight was noted among those fed no or less than four meals per day than those having four feeds and above (34.5% vs. 24.3%, X^2 4.1, $P<0.05$, df 1).

It is notable that the vitamin A coverage (supplementation 6 months prior to the survey) in the two Highlands was lower than the recommended 95 per cent coverage Sphere Standards, 2011. Such coverage does not significantly differ between both Highlands, urban/rural residence, or gender. There is no effect was found for vitamin A supplementation on stunting, underweight and wasting prevalence.

Suboptimal infant and child feeding and insufficient vitamin A supplementation being a proxy for poor public health services, seem to negatively affect the nutrition well-being of Ibb population.

5.2: Vaccination coverage and Malnutrition Levels

Regarding vaccination, the percentage of children who have been vaccinated the third dose of polio vaccination found to be significantly higher in Eastern Highlands than in Western Highlands (67.5% vs. 77.6%, X^2 25.1, $P<0.0001$, df 1). Similarly it is higher in urban compared rural residence (93.7% vs.70.2%, X^2 66.2, $P<0.0001$, df 1).

Although GAM and SAM was not associated with the third dose of polio vaccination, children who receive it have lower underweight prevalence (34.9% vs. 42.4%, X^2 9.3, $P<0.01$, df 1). Similarly, the prevalence of stunting is significantly higher among those who did not receive polio vaccination (63.2% vs. 54.3%, X^2 12.6, $P<0.0001$, df 1).

The measles vaccination coverage of children aged 9 months to below 60 months, is higher in Eastern than Western Highlands (81.0% vs. 74.1%, X^2 12.3, $P<0.0001$, df 1). It is also higher in urban than rural residence (95.6% vs. 75.5%, X^2 51.7, $P<0.0001$, df 1).

Although, measles vaccination does not differ by gender or GAM and SAM, having no measles vaccination significantly associated with higher prevalence of stunting (67.2% vs. 55.4%, X^2 17.5, P<0.0001, df 1) and underweight (43.1% vs. 36.0%, X^2 6.6, P<0.05, df 1).

Such association between polio and measles vaccination and stunting and underweight may be confounded by better health awareness among those who have higher vaccination coverage. Alternatively, vaccination may has this effect through reducing infections (e.g. whooping cough, diarrhea, measles etc.) which known to be strongly related with malnutrition (see below).

Nevertheless, the above immunization coverage are still lower than the Sphere Standards recommended 95 per cent coverage.

5.3: Morbidity and vaccination

Almost all types of morbidities found to be significantly higher among non-vaccinated children as shown on table 19 which necessitates fostering EPI program fixed and outreach services.

Table 19. Morbidity and vaccination

Morbidity		Vaccination status		Statistical significance
		Yes	*No*	
1. Pentavalent vaccine				
Diarrhea	Yes	37.8 (549)	44.6 (237)	X^2: 7.9, P<0.01, df 1
ARI	Yes	48.6 (710)	55.4 (293)	X^2: 7.2, P<0.01, df 1
Fever	Yes	57.7 (844)	66.5 (352)	X^2: 12.6, P<0.0001, df 1
Measles	Yes	1.0 (15)	1.9 (10)	X^2: 2.3, P>0.05, df 1
2. Measles vaccine				
Diarrhea	Yes	36.5 (522)	43.5 (174)	X^2: 6.4, P<0.05, df 1
ARI	Yes	48.2 (691)	56.8 (227)	X^2: 2.3, P<0.01, df 1
Fever	Yes	57.6 (826)	64.8 (259)	X^2: 6.6, P<0.05, df 1
Measles	Yes	1.0 (14)	2.3 (9)	X^2: 4.1, P<0.05, df 1

5.4: Morbidity and Malnutrition Levels

The disease prevalence was recorded as being high in the governorate. Although diarrhea did not significantly differ between Eastern and Western Highlands or gender, it is significantly higher among rural than urban residence (41.6% vs. 25.7%, X^2 24.8, P<0.0001, df 1).

Diarrhea surprisingly found not to be associated with wasting, stunting, or underweight.

Regarding the ARI, it was found to be higher among Eastern Highlands (52.4% vs. 47.6%, X^2 4.0, P<0.05, df 1). However, it does not differ by urban or rural residence or gender. Although ARI found not to be associated with wasting it was significantly associated with stunting (59.2% vs. 53.8%, X^2 6.0, P<0.05, df 1), and underweight (54.3% vs. 33.6%, X^2 9.0, P<0.01, df 1).

Similarly, although the prevalence of fever two weeks prior to the survey was similar in Eastern and Western Highlands and similar for both gender, it is significantly higher in rural than urban residence (62.4% vs. 45.4%, X^2 28.4, P<0.0001, df 1).

Suspected measles[20] during the last month was higher in Western Highlands than Eastern Highlands (1.9% vs. 0.8%, X^2 5.3, P<0.05, df 1). Although measles does not significantly differ by gender, urban/rural residence and is not associated with GAM or SAM, underweight prevalence found to be higher among those who had measles (60% vs. 36.7%, X^2: 5.8, P<0.05, df 1). Similarly stunting prevalence found to be higher among those who had measles (88.0% vs. 56.2%, X^2: 10.2, P<0.01, df 1).

Such high prevalence of different morbidities could indicate low herd immunity, inadequate health services and low vaccination coverage, or inappropriate living condition, predisposing the population to illness. Generally, the mortality risk due to malnutrition is high, with an estimated 53 per cent mortality during emergency being associated with malnutrition while other conditions have lower rates of association, according to Lancet, 2008[21]. High disease prevalence only worsens the situation. Such a relationship that identified between morbidities and malnutrition, calling for appropriate and adequate health service provision in order to address the malnutrition.

5.5: Nutrition Status and Household Caretaker Education

The association between education level of mothers and the child nutritional status is well reported by all large scale survey done in Yemen since 1991. Although, there is no association could be identified in Ibb survey between mother's education and GAM or SAM, highly significant association were found with stunting and underweight. Illiterate mothers' children have significantly higher prevalence of stunting (60.0% vs. 47.6%, X^2 27.0, P<0.0001, df 1) and higher prevalence of underweight (39.1% vs. 31.8%, X^2 9.0, P<0.01, df 1). Therefore, a focus on girls' education is necessary in the long term battle against malnutrition.

[20] The suspected measles is defined as having rash and fever in addition to at least one of: cough, sore throat, or conjunctivitis.

[21] **Jean-Pierre Habicht. Malnutrition kills directly, not indirectly. The Lancet, Volume 371, Issue 9626, Pages 1749 - 1750, 24 May 2008**

Regarding the association between mother's education and morbidities, although diarrhea did not significantly related to mother education, mother's education found to be significantly associated with ARI (52.1% vs. 46.7%, X^2 4.7, P<0.05, df 1), and fever (62.6% vs. 54.1%, X^2 12.3, P<0.0001, df 1). The association between mother's education and having measles was only approaching significance may be due to few measles cases (1.5% vs. 0.5%, X^2 3.6, P=0.059).

Although such association between mother's education and morbidities may be confounded by higher vaccination among educated mother which reduce infection as shown by significantly higher morbidities among non-vaccinated children (table 19), there is a strong need to encourage girl education for its clear and well documented profits on children and community health.

5.6: WASH and Morbidities and Nutrition Situation

WASH known to be an important factor in relation to morbidities as well malnutrition. Clean water container (i.e. no algae seen) found to be significantly higher in Eastern than Western Highlands (66.3% vs. 57.2, X^2 17.4, P<0.0001, df 1).

Diarrhea found to be significantly higher among households not using clean storage for drinking water (42.6% vs.37.6%, X^2 5.0, P<0.05, df 1). Although, there is no significant association found between not using clean storage for drinking water and GAM or SAM there is highly significant association between not using clean storage and underweight (43.8% vs.33.0%, X^2 23.1, P<0.0001, df 1) and stunting (64.5% vs.51.8%, X^2 30.4, P<0.0001, df 1) respectively. This confirms previous findings from Hajja nutrition survey[22]. Repeated attacks of diarrhoea – that may be associated to poor environmental sanitation- found to be associated with tropical enteropathy with resultant poor nutrient absorption and considerable nutrient losses[23]. The resulting nutritional deficiency causes impaired immunity and increased vulnerability to more infection resulting in a vicious cycle of infection and malnutrition.

Having no flush/pour flush latrine found to be strong associated with diarrhea (47.3% vs.35.4%, X^2 26.8, P<0.0001, df 1), with GAM (10.5% vs. 7.2%, X^2 6.1, P<0.05, df 1), underweight (44.8% vs. 32.9%, X^2 27.4, P<0.0001, df 1), and stunting (61.8% vs. 53.8%): X^2: 11.7, P<0.01, df 1). Whether this is due to direct benefits or reflecting better socio-economic status can be not be ascertained.

The household caretaker handwashing practice (e.g. hand washing: after toilet, before cooking, before feeding child, and after disposal of child's faces) showed important associations with diarrhea as shown in tables 20 below. Furthermore, lack of soap found to be associated with higher diarrhea prevalence.

[22] UNICEF. Nutrition Survey among U5 Children and Women of Childbearing Age in Three Districts in Hajja Governorate, Yemen. July, 2011

[23] Jean H Humphrey. Child undernutrition, tropical enteropathy, toilets, and Handwashing. Lancet.com Vol 374 September 19, 2009:1032-35

Table 20. WASH and diarrhea

WASH indicator	Mentioned	Diarrhea Prevalence	Statistical significance
1. Hand washing after toilet	Yes	35 (370)	X^2: 19.0, P<0.0001, df 1
	No	44.5 (419)	
2. Hand washing before meal	Yes	38.3 (233)	X^2: 0.5, P>0.05, df 1 (NS)*
	No	39.9 (555)	
3. Hand washing After meal	Yes	35.6 (317)	X^2: 10.0, P<0.01, df 1
	No	42.6 (472)	
4. Hand washing before cooking	Yes	35.6 (230)	X^2: 6.0, P<0.05, df 1
	No	41.3 (559)	
5. Hand washing before feeding child	Yes	27.1 (35)	X^2: 8.8, P<0.01, df 1
	No	40.3 (753)	
6. Hand washing after disposal of child's faces	Yes	30.7 (101)	X^2: 12.6, P<0.0001, df 1
	No	41.2 (687)	
7. Hand washing after cleaning livestock's place	Yes	32.3 (104)	X^2: 8.1, P<0.01, df 1
	No	40.8 (682)	
8. Using water for hand Washing	Yes	39.2 (762)	X^2: 2.1, P>0.05, df 1 (NS)*
	No	49.1 (27)	
9. Using soap for hand washing	Yes	34.7 (507)	X^2: 52.3, P>0.0001, df 1
	No	52.5 (280)	
10. Using ash/leaves/sand for hand washing	Yes	46.7 (7)	X^2: 0.3, P>0.05, df 1 (NS)*
	No	39.4 (780)	

*NS. Not significant

The household caretaker handwashing practice also showed important associations with malnutrition as shown in tables 20 below. More importantly, water availability for hand washing, soap availability for hand washing is significantly associated with GAM and underweight. Hand washing after toile and before feeding child also significantly associated with stunting. Therefore, hygiene promotion is a key intervention contributing reducing morbidities and eventually better nutrition and well-being of the population.

Table 20. WASH and malnutrition

WASH indicator	Yes/NO	Malnutrition Prevalence	Statistical significance
1. GAM			
1. Using water for hand	Yes	8.1 (156)	X^2: 6.8, P<0.01, df 1

WASH indicator	Yes/NO	Malnutrition Prevalence	Statistical significance
Washing	No	17.9 (10)	
2. Using soap for hand washing	Yes	7.6 (110)	X^2: 4.4, P<0.05, df 1
	No	10.5 (56)	
2. Underweight			
1. Using water for hand Washing	Yes	36.3 (701)	X^2: 14.9, P<0.0001, df 1
	No	61.8 (34)	
2. Using soap for hand washing	Yes	34.8 (506)	X^2: 11.5, P<0.01, df 1
	No	43.1 (229)	
3. Stunting			
1. Hand washing after toilet	Yes	53.4 (560)	X^2: 9.0, P<0.01, df 1
	No	60.1 (562)	
3. Hand washing before feeding child	Yes	43.8 (56)	X^2: 9.1, P<0.01, df 1
	No	57.4 (1065)	
4. Using soap for hand washing	Yes	54.8 (794)	X^2: 7.4, P<0.01, df 1
	No	61.6 (327)	

5.7 Food insecurity

Food insecurity indicators found to be high in Ibb governorate (e.g. 41% reduce the size of meals, 17.7% reduce the number of meals, 19.3% slept hungry etc.). This confirm previous reports that Ibb is one of the four governorates that have the highest numbers of food insecure households with severe hunger where 51.6% of all food insecure households with severe hunger are located[24]. Furthermore, Western Highlands were found to have significantly higher percentage and more vulnerable than Eastern Highlands un different indicators e.g. reducing the size of meals because of the scarcity of resources (46.3% vs. 30.3%, X2 49.7, P<0.0001, df 1), member go the bed in night hungry because of not enough food (25.1% vs. 10.7%, X2 92.7, P<0.0001, df 1) respectively.

Food security also found to be more in rural than urban areas e.g. as regard reducing the size of meals because of the scarcity of resources (44.8% vs. 33.3%, X2 49.7, P<0.0001, df 1), member go the bed in night hungry because of not enough food (27.5% vs.10.7%, X2 90.6, P<0.0001, df 1) respectively. This support previous findings that rural-urban inequalities are high in Yemen and the number of food insecure people living in rural areas is more than five times higher than in urban areas[70].

[24] WFP. YEMEN: Secondary Data Analysis on Food Security and Vulnerability, 2009

Additionally, food insecurity found to be significantly associated with stunting i.e. the prevalence of stunting is higher among those who reduce meals size than those who did not (62.7% vs.52.5%, X2 20.4, P<0.0001, df 1), those reduce males' number (64.4% vs.55.1%, X2 10.1, P<0.01, df 1), slept hungry (61.7% vs.55.7%, X2 4.5, P<0.05, df 1), borrow food/money to purchase food or purchase food in credit (61.2% vs.48.5%, X2 29.6, P<0.0001, df 1), reduce expenditure on education or health to save money to purchase food (61.0% vs.55.6%, X2 3.9, P=0.05, df 1) respectively.

Similarly, food insecurity found to be significantly associated with underweight i.e. the prevalence of underweight is higher among those reduce males' size (43.1% vs.33.1%, X2 20.4, P<0.0001, df 1), reduce males' number (44.9% vs.35.6%, X2 10.6, P<0.01, df 1), reduce expenditure on education or health to save money to purchase food (41.1% vs.36.1%, X2 4.3, P<0.05, df 1), borrow food/money to purchase food or purchase food in credit (41.2% vs.30.1%, X2 23.6, P<0.0001, df 1), reduce expenditure on education or health to save money to purchase food (41.1% vs.36.1%, X2 4.3, P<0.05, df 1) respectively.

Regarding Acute Malnutrition, only the prevalence of GAM found to be higher among those who slept hungry (11.1% vs.7.8%, X2 4.2, P<0.05, df 1). Also, SAM found to be higher among those who reduce expenditure on education or health to save money to purchase food (2.4% vs.1.1%, X2 3.9, P=0.05, df 1).

6.0 RECOMMENDATIONS

The levels of acute malnutrition in Ibb were found to be less than predicted based on data collected from Hodeidah and Taiz that have both boarders and similar livelihood and conditions and aggregative factors to that of Ibb but still it is higher than WFP-CFSS 2011 survey. Being the most densely populated governorate in Yemen, the estimated caseloads are high in Ibb and should attract more attention.

Although mortality is still low, the critical levels of stunting and underweight in both zones that are above the critical levels as per WHO categorization as well as the GAM rates that are equal to the "poor" according to WHO classification i.e. between 5 - 9.9 per cent require an urgent intervention to address the situation a cross the governorate. It is also important to note that there are pockets of vulnerability in the two zones with high levels of acute and chronic malnutrition, comparable to the prevalence seen in neighbouring Hodeidah Governorate as well as in Taiz governorate.

The existence of multi-sectoral aggravating factors like poor feeding practices, high prevalence of communicable diseases, insufficient coverage of essential health services like immunization and micronutrient supplementation in addition to high level of illiteracy among the majority of caretakers are appealing and calling for an integrated multi-sectoral action. The need to deliver an integrate package of services to mothers and their children is very important not only to address the high wasting level but also to address the high level of stunting and underweight as well as other development indicators.

Politicians and decision makers along with development partners need to keep the fighting undernutrition among U5 on top of their political and development agenda. Since early 1970s; stunting among U5 children was and continue to be one of the highest levels in the world. Through simple analysis utilizing the data collected from Hodeidah, Taiz, Hajja and finally Ibb governorates which are dwelled by around 40 per cent of Yemenis, it simply can be identified that around one million of U5 children in this four governorates are stunted; threatening to the development future of Yemenis.

Below are the main immediate and medium-term recommendations:

Immediate Interventions

- Develop detailed integrated response micro-plan articulating district level humanitarian needs, delivering response package, coverage and gaps to document the progress, advocacy and lessons learnt.
- Priority should be given to pockets of vulnerability in both zones through mobilizing outreach services to rapidly address the high GAM/SAM rates.
- Development of CMAM protocol, strengthen and expanding CMAM services to reach all the existed health facilities and outreach services.
- CMAM services should adhere to the CMAM protocol (ensuring systematic treatment and full consideration of moderate acute malnutrition management) that should be integrated with infant feeding, hygiene promotion and food security interventions.
- to promote appropriate IYCF practices (early initiation of breastfeeding, exclusive and sustained breastfeeding for 2 years and promotion of appropriate complementary feeding practices for children aged 6 to 24 months) along with micronutrient supplementations and deworming.

- Accelerate the integration of IYCF counseling into all CMAM services delivered by both fixed and mobile clinics.
- Intensive social mobilisation campaigns on IYCF feeding and caring practices through behavior change / communication interventions mainly in the following areas; timely introduction of complementary food and continue breastfeeding up to two years, along with Vit. A supplementation, micronutrient supplements, and promotion of safe sanitation and hygienic practices including hand washing with soap as well as safe disposal of children's excreta, diarrhoea prevention measures and appropriate management of ARI among young children

Medium Term Interventions

- From the development point of view, there is an essential need for Yemen to be an active member in the global SUN movement.
- High level advocacy with the GOY and politicians to mobilise their commitment to fight undernutrition among U5 Yemeni children.
- Scaling up implementation of the national nutrition strategy and related action to address the high level of malnutrition in line with the lifecycle approach along with promotion of maternal nutrition.
- Continued support for longer term water development and sanitation programmes throughout the governorate, with community mobilization activities to promote safe sanitation and hygienic practices.
- Follow up SMART nutrition survey and coverage survey in 2013 to track the progress on implementation of the response plan.
- Exploring new initiatives to promote small scale income generating projects, draw lessons learnt and replicate the successful projects.
- Promote improved latrine use and other hygiene services like Community Led Total Sanitation (CLTS) strategy.

Other Recommendations

- Further investigation is needed to understand the causality tree behind high level of acute malnutrition among boys compared to girls found in this survey as well as earlier surveys conducted in Hodeidah, Taiz, Hajja governorates.
- Undertaking full scale national nutrition and mortality survey.
- In a view of high malnutrition among illiterate mothers' children found in this as well as previous surveys in Yemen, a focus on girls' education is necessary in the long term battle against malnutrition.

7. Annexes

استبيان رقم: .....

Annex 1: Ibb Nutrition Survey Questionnaire

الجمهورية اليمنية
وزارة الصحة العامة والسكان
مكتب الصحة العامة والسكان بمحافظة إب

مسح الحالة التغذوية والوفيات في محافظة إب
نوفمبر - ديسمبر 2012م

استبيان الأسرة (نموذج 1)

أولاً. يتم الشرح للساكنين في المسكن (البالغين منهم) عن المسح والتعريف بالجهة القائمة عليه والأشخاص العاملين فيه (أعضاء الفريق)، ثم بعد ذلك الحصول على الموافقة الشفهية منهم.

الموافقة	.1	نعم		
	.2	لا		انتقل إلى النهاية

تاريخ المقابلة	يوم		شهر		سنـــــة			
					2	Ø	1	2

المديرية	العزلة	القرية/ الحارة
الاسم	الاسم	الاسم

اسم رب الأسرة:	

فريق المسح رقم		الاسم	التوقيع
	الاسرة والأنثروبومتري		
	الوفيات		
	رئيس الفريق		

بين فيما إذا كان هناك:		
.1	غياب الأسرة عند الزيارة الأولى ويتطلب الأمر زيارة ثانية	
.2	غياب طفل عند الزيارة الأولى ويتطلب الأمر زيارة ثانية*	

* عند غياب الطفل، تستكمل كل بياناته عدا القياسات الإنثروبومترية والأوديما حيث تستكمل عند حضوره.

ملاحظة: البيانات في الغلاف هي للاستخدام الميداني والإداري من قبل أعضاء الفريق.

استبيان رقم: .....

يملئ من قبل رئيس الفريق (تستخدم لإدخال البيانات)

غياب الأسرة حتى بعد الزيارة الثانية (1 نعم ، 2 لا)	
الموافقة (1 نعم ، 2 لا)	

رقم الفريق	

رقم استبيان الأسرة				

تاريخ المقابلة	ي	ي		ش	ش		س	س	س	س
							2	1	Ø	2

هل المنطقة حضرية (1) أم ريفية (2)	

رمز القرية / الحارة			رمز العزلة	
رمز المديرية			رمز المحافظة	1 1
رقم **طبقة** المسح			رقم العنقود	

العمل المكتبي

	الاسم	**اليوم**		**الشهر**		**السنة**				**التوقيع**
إدخال البيانات										
المراجعة										
ترميز أخرى										

الملاحظات

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استبيان رقم: .....

س 001: بيانات عن الأسرة (الأحياء فقط والذين يعيشون حاليا في الأسرة)

H001a	عدد أفراد الأسرة (الأحياء فقط الذين يعيشون حاليا في الأسرة تاريخ المسح)	**العدد**	

H001b	عدد الأطفال أقل من 5 سنوات (الأحياء فقط الذين يعيشون حاليا في الأسرة تاريخ المسح)	**العدد**	

H001c	عدد الأطفال أقل من 6 أشهر (الأحياء فقط الذين يعيشون حاليا في الأسرة تاريخ المسح)	**العدد**	

س 002 – س 003: بيانات رب الأسرة

H002	مانوع رب الأسرة		
	1. ذكر		
	2. أنثى		

H003	الحالة الاجتماعية لرب الأسرة		
	1. متزوج ويعيش مع شريكه.		
	2. متزوج لكنه لا يعيش مع الشريك منذ ستة أشهر أو أكثر.		
	3. أرمل.		
	4. مطلق.		
	5. حانق		
	6. عازب.		

س 004: بيانات راعي الأسرة

H004	المستوى التعليمي لراعي الأسرة		
	1. أمي.		
	2. يقرأ ويكتب.		
	3. تعليم أساسي.		
	4. تعليم ثانوي.		
	5. تعليم عالي (جامعة أو كلية أو معهد).		

استبيان رقم: .....

س 005: مصدر دخل الأسرة

H005	ماهو مصدر الدخل **<u>الرئيسي</u>** للأسرة؟			
	.1	منتجات زراعية غير القات.		
	.2	حيوانات ومنتجات الحيوانية.		
	.3	اسماك.		
	.4	تجارة.		
	.5	عمل مؤقت.		
	.6	وظيفة دائمة براتب شهري.		
	.7	حوالات (من المغتربين).		
	.8	أعمال حرفية.		
	.9	زراعة/ بيع/ نقل القات.		
	.1Ø	هبات (من الأهل أو الأصدقاء).		
	.11	ضمان إجتماعي.		
	.12	أخرى: تذكر		

س 006 – س 012: بيانات عن الماء والإصحاح البيئي والنظافة

H006	ماهو المصدر الرئيسي **<u>لمياه الشرب</u>** في منزلكم؟ (خيار واحد فقط)			
	.1	أنابيب مياه موصلة إلى البيت.		
	.2	أنابيب مياه موصلة إلى فناء البيت.		
	.3	بئر مفتوحة غير محمية.		
	.4	بئر مفتوحة محمية.		
	.5	خزان مغطى لحصاد مياه الأمطار.		
	.6	خزان مفتوح لحصاد مياه الأمطار.		
	.7	سيارة نقل المياه (وايت ماء)		
	.8	مياه صحية معبأة (حدة، شملان، كوثر الخ)		
	.9	مياه سطحية غير محمية (وادي، عين ماء جاري، الخ)		
	.1Ø	عين ماء محمية		
	.11	أخرى: تذكر		

				إنتقل إلى
H007a	هل تقومون بمعالجة الماء قبل **الشرب؟**			
	.1	نعم		
	.2	لا		H~~008~~
	.3	لا أعرف		H~~008~~

H007b	ماهي طريقة المعالجة **الرئيسية** المستخدمة **لمياه الشرب** (خيار واحد فقط)			
	1.	غلي الماء قبل الشرب		
	2.	استخدام الكلور		
	3.	الترشيح عبر قماش نظيف		
	4.	استخدام مرشح سيراميك أو رمل أو ماشابه (فلتر أو قطارة)		
	5.	ترك الماء ساكنا قبل الشرب لترسيب الشوائب.		
	6.	استخدام الشب (شب الفؤاد)		
	7.	أخرى: تذكر		

H008	**للملاحظة**: **تحقق** من توفر نقاط تخزين المياه **لغرض الشرب**: هل الوعاء الحاوي لمياه الشرب نظيف؟ (عدم وجود طحالب يعني رقم 1 ووجود الطحالب يعني رقم 2)			
	1.	نعم.		
	2.	لا.		

H009	اين تتم عملية قضاء الحاجة (التبرز)؟ (اختر فقرة من التالي)- **تحقق** من توفر المرافق والممارسات			
	1.	مرحاض - يتوفر فيه صب الماء للتنظيف الذاتي (سيفون أو دلو).		
	2.	مرحاض - حفرة دون غطاء.		
	3.	مرحاض - حفرة مغطاة بطريقة بسيطة (الجاف).		
	4.	قضاء الحاجة في العراء (في الحقول مثلا، الخ.)		
	5.	أخرى: تذكر		

H010	متى تقومين بغسل اليدين باستخدام الصابون أو الرماد أو التراب أو أوراق الشجر أو ي مادة اخرى؟ (ضع علامة أمام أكثر من فقرة إذا قام الشخص بذكرها. **يرجى عدم طرح خيارات الإجابة على المستجيب**					
	a.	بعد قضاء الحاجة	.1	نعم		
			.2	لا		
	b.	قبل الأكل	.1	نعم		
			.2	لا		
	c.	بعد الأكل	.1	نعم		
			.2	لا		
	d.	قبل الطبخ	.1	نعم		
			.2	لا		
	e.	قبل إطعام الطفل	.1	نعم		
			.2	لا		
	f.	بعد التخلص من براز الطفل	.1	نعم		
			.2	لا		
	g.	بعد التنظيف لمكان المواشي والدواجن	.1	نعم		
			.2	لا		
	h.	اية إجابات أخرى: تذكر:				

H011	**للملاحظة**: في نقطة غسل اليدين، تحقق من وجود التالي					
	a.	الماء	.1	نعم		
			.2	لا		
	b.	الصابون	.1	نعم		
			.2	لا		
	c.	الرماد/ التراب/ القضاض/ أوراق الشجر.	.1	نعم		
			.2	لا		

H012a	أين تحصلون بصورة رئيسية على الرعاية الصحية عندما يمرض أحد أفراد الأسرة؟			**إنتقل إلى**
	.1	لا أطلب مساعدة طبية		
	.2	تداوي شخصي		
	.3	معالج تقليدي/ شعبي		
	.4	شيخ/ القرآن		
	.5	صيدلية		
	.6	عيادة خاصة		C~~13~~
	.7	مرفق صحي عام		C~~13~~

H012b	في حالة عدم الحصول على الخدمة الصحية، ماهو السبب الذي يجعلكم لاتسعون للحصول على الخدمة في مرفق صحي أو عيادة عند المرض؟			
	.1	الكلفة عالية		
	.2	المرفق بعيد ولا تتوفر مواصلات		

	3.	لايوجد وقت كافي		
	4.	لا نثق في خدما ت المرافق القريبة		
	5.	أخرى: تذكر		

س 013 – س 017: خاص بحالة الأمن الغذائي (الإجابة على هذه الإسئلة يجب أن تكون وفقا للحالة خلال الـ 30 يوم الماضية)

H013	خلال الثلاثين اليوم الماضية، هل حدث أن لجأ (الاسم) أو أحد أفراد الأسرة إلى تصغير حجم الوجبات في اليوم بسبب شحة الموارد؟			
	.1	نعم		
	.2	لا		

H014	خلال الثلاثين اليوم الماضية، هل حدث أن لجأ (الاسم) أو أحد أفراد الأسرة إلى تقليل عدد الوجبات في اليوم بسبب شحة الموارد؟			
	.1	نعم		
	.2	لا		

H015	خلال الثلاثين اليوم الماضية، هل حدث أن ذهب (الاسم) أو أحد أفراد الأسرة إلى النوم في الليل وهو جائع بسبب عدم كفاية الغذاء؟			
	.1	نعم		
	.2	لا		

H016	خلال الثلاثين اليوم الماضية، هل حدث وأن قامت الأسرة باستلاف الغذاء، أو أقترضت نقودا من أجل شراء الغذاء أو قامت بشراء الغذاء بالآجل (الدين) أو الرهن **بسبب عدم توفر النقود؟**			
	.1	نعم		
	.2	لا		

H017	خلال الثلاثين اليوم الماضية، هل حدث أن قللت الأسرة الإنفاق على التعليم والصحة لشراء مواد غذائية؟			
	.1	نعم		
	.2	لا		

س 018: حالة تيويد ملح الأسرة

H018	قم بفحص الملح الذي استخدمته الأسرة يوم أمس بواسطة كاشف اليود السريع؟			
	.1	لايوجد اليود.		
	.2	يود أقل من 15 جزء في المليون		
	.3	يود بنسبة 15 جزء في المليون أو أكثر		
	.4	لم يعمل الفحص		

استبيان رقم: .....

س 019 – س 025: حالة الإطعام والتحصين للأطفال في سن 6-59 شهراً في الأسرة

		C019	C020a	C020b	C021	C022a
رقم الطفل	الاسم الأول للطفل	نوع الطفل 1= ذكر 2 = أنثى	تاريخ الميلاد (بالهجري أو الميلادي)	عمر الطفل (بالأشهر) (إذا كان الطفل أكبر من 24 شهر انتقل إلى السؤال C023)	للطفل الذي عمره 24 شهر أو أقل. هل مازال الطفل يرضع (رضع خلال الـ 12 ساعة الماضية)؟ 1= نعم 2 = لا	للطفل الذي عمره 24 شهر أو أقل. كم مرة قمتي بإطعام الطفل خلال 24 ساعة الماضية؟ (يرجى عدم حساب مرات الرضاعة الطبيعية)
.1			يوم شهر سنـــة			
.2			يوم شهر سنـــة			
.3			يوم شهر سنـــة			
.4			يوم شهر سنـــة			
.5			يوم شهر سنـــة			
.6			يوم شهر سنـــة			
.7			يوم شهر سنـــة			

استبيان رقم: .....

			C022b	C023	C024	C025
رقم الطفل (كما سبق أعلاه)	الاسم الأول للطفل	عمر الطفل (بالأشهر)	للطفل الذي عمره 24 شهر أو أقل. كم مرة قمتي بإعطاء الطفل حليب خلال 24 ساعة الماضية؟ (يرجى عدم حساب مرات الرضاعة الطبيعية)	هل تم إعطاء الطفل فيتامين (أ) خلال الستة أشهر الماضية؟ (إظهار عينة) 1 = نعم 2 = لا 3= لا أعرف	هل أخذ الطفل جرعة لقاح الخماسي3/ الشلل3؟ 1 = نعم 2 = لا	للأطفال بعمر تسعة أشهر فأكبر. هل تم تطعيم الطفل ضد الحصبة. (حقنة في اليد اليسرى)؟ 1 = نعم من البطاقة. 2 = نعم بالتذكر. 3 = لا أعرف 4 = لم يطعم
.1						
.2						
.3						
.4						
.5						
.6						
.7						

س 026 – س 035: القياسات الجسمانية ومراضة الأطفال بين سن 6-59 شهر في الأسرة

			C026	C027	C028	C029
رقم الطفل (كما سبق أعلاه)	الاسم الأول للطفل	عمر الطفل (بالأشهر)	الوزن (كيلو جرام) 88.8 = رافض 99.9 = غائب	الطول (سم) 888.8 = رافض 999.9 = غائب	التوذم (أوديما) في كلا القدمين. 1 = نعم 2 = لا 8 = رافض 9 = غائب	قياس محيط الذراع (سم) (الميواك) 88.8 = رافض 99.9 = غائب
.1			.	.		.
.2			.	.		.
.3			.	.		.
.4			.	.		.
.5			.	.		.
.6			.	.		.
.7			.	.		.

استبيان رقم: .....

			C030	C031	C032	C033	C034	C035
رقم الطفل (كما سبق أعلاه)		عمر الطفل (بالأشهر)	الإسهال خلال الأسبوعين الماضيين 1 = نعم 2 = لا	سعال أو صعوبة في التنفس خلال الأسبوعين الماضيين 1 = نعم 2 = لا	الحمى خلال الأسبوعين الماضيين 1 = نعم 2 = لا	الاشتباه بالحصبة خلال الشهر الماضي (طفح جلدي + حمى + (سعال أو إلتهاب حلق أو إلتهاب الملتحمة) 1 = نعم 2 = لا	هل نام الطفل تحت شبك الناموس الليلة الماضية؟ 1 = نعم 2 = لا	هل الطفل مسجل حالياً في أي مركز تغذية 1= SFP (تغذية تكميلية) 2= TFC (معالجة سوء التغذية في القسم الداخلي في المستشفى) 3= OTP (معالجة سوء التغذية في العيادة خارجية) 4= أخرى 5 = غير مسجل
.1								
.2								
.3								
.4								
.5								
.6								
.7								

Questionnaire Number: ……

مسح الحالة التغذوية والوفيات في محافظة إب ، نوفمبر – ديسمبر 2012م

استمارة رصد أفراد الأسرة خلال فترة 90 يوم من تاريخ المسح (نموذج 2)

مديرية المسح: _____ **الحي:** _____ **التاريخ:** _____ **رقم العنقود:** _____ **رقم الفريق:**

_____ **رقم إستبيان الأسرة:** _____ **طبقة المسح:** _____

م	الاسم (اختياري)	الجنس (ذكر أو أنثى)	العمر بالسنوات	التحق أثناء فترة 90 يوم	غادر أثناء فترة 90 يوم	ولد أثناء فترة 90 يوم	توفي أثناء فترة 90 يوم	سبب الوفاة	موقع الوفاة
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

هام: يتم تسجيل كل الأفراد الموجودين حاليا وكل من التحق بالأسرة أو غادرها أو توفى أو ولد خلال 90 يوم من تاريخ المسح

رموز أسباب الوفاة	
1 = الاسهال	**5 = سوء التغذية**
2 = الحمى	**6= العنف / بسبب الصراعات**
3= الحصبة	**7= أخرى (حدد)**
4 = مشاكل في التنفس	
رموز مواقع الوفاة	
1 = في الموقع الحال	
2= أثناء الهجرة	
3= في آخر مكان سكن فيه	
4 = أخرى (حدد)	

Questionnaire Number: ……

Annex 2: Ibb Nutrition Survey English Questionnaire

Republic of Yemen
Ministry of Public Health and Population
Office of Public Health and Population, Ibb Governorate

Nutritional Status and Mortality Survey – Ibb Governorate, Nov – Dec 2012

Household Questionnaire (Form 1)

First: Explain to the residents of the household (adults) about the survey and inform them of the agency conducting the survey and survey staff (team members). Then request their verbal agreement to participate in the survey.

Consent	1.	Yes.		
	2.	No.		Go to the end.

Date of interview	day		month		year			
					2	Ø	1	2

District	**Ozla (Sub-district)**	**Village/ Hara**
Name	Name	Name

Name of head of household	

Survey team number ……		**Name**	**Signature**
	Household and anthropometric data		
	Mortality data		
	Team leader		

Indicate which situation applies:		
1.	Absence of household upon first visit which necessitated a second visit	
2.	Absence of child upon first visit which necessitated a second visit *	

* If the child is not present, all data should be filled in except anthropometric measurements and edema which should be completed only if the child is present.

Note: The data inside the cover is for field and administrative use by the team members.

Questionnaire Number: ……

To be filled by the Team Leader (for data input purposes)

Repeated absence of the household even after the second visit (1=yes, 2=no)	
Consent (1=yes, 2=no)	

Team Number		

Household Questionnaire Number				

Date of Interview	day		Month		year				
						2	Ø	1	2

Is the region urban (1) or rural (2)?	

Village or neighborhood code number			Sub-district code number		
District code			Governorate code number	1	1
Survey zone (stratum) number			Cluster number		

Stratum number is (1) for Eastern Mountains Zone and (2) for Western Mountains

……
……

Desk work

	Name	**day**		**month**		**Year**				**Signature**
Data entry										
Review										
Other encoding										

Remarks:

……
……

……
……

……
……

……
……

……
……

……

Questionnaire Number: ……

Q001: Household data (only those who are alive and living together continuously)

H001a	Number of household members (only those who are alive and living with the household on the date of the survey)	Quantity	

H001b	Number of children under five (only those who are alive and living with the household on the date of the survey)	Quantity	

H001c	Number of children under six months (only those who are alive and living with the household on the date of the survey)	Quantity	

Q002 – Q003: Head of household data

H002	Gender of the head of household			
	1.	Male		
	2.	Female		

H003	Social status of the head of household			
	1.	Married and living with partner		
	2.	Married and not living with partner for at least six months or more.		
	3.	Widow/widower		
	4.	Divorced		
	5.	Angered and separated/ Recalcitrant		
	6.	Single		

Q004: Household caretaker data

H004	Education level of household caretaker			
	1.	Illiterate.		
	2.	Can read and write (literate).		
	3.	Basic education.		
	4.	Secondary education.		
	5.	Tertiary education (university, college, or institute).		

Q005: Household income source

H005	What is the **primary** source of income for the household?			
	1.	Non-qat agricultural products		
	2.	Livestock and livestock products		

	3.	Fishery		
	4.	Trading		
	5.	Temporary work (Casual work)		
	6.	Monthly salary		
	7.	Remittance (from emigrants)		
	8.	Craftsmanship		
	9.	Farming/sale/transport of qat		
	1Ø.	Donation (from friends and relatives)		
	11.	Social insurance		
	12.	Other: specify -		

Q006 – Q012: Water, environmental sanitation, and hygiene data

H006	What is the main source of **drinking water** in your home? (choose one only)			
	1.	Piped water connected to home.		
	2.	Piped water connected to yard.		
	3.	Open, unprotected well.		
	4.	Open, protected well.		
	5.	Covered rainwater collection tank.		
	6.	Open rainwater collection tank.		
	7.	Water delivery truck.		
	8.	Bottled water (Hadda, Shamlan, Kawthar, etc.)		
	9.	Unprotected surface water (valley, running spring, etc.)		
	1Ø.	Protected spring water.		
	11.	Other: specify -		

H007a	Do you treat the water before drinking?			Go to
	1.	Yes		
	2.	No		→ H008
	3.	Don't know.		→ H008

H007b	What is the **main** method used to treat **drinking water**? Choose only one.			
	1.	Boil water before drinking.		
	2.	Use chlorine substance.		
	3.	Filter through clean cloth.		
	4.	Use ceramic or sand filter or similar filter method.		

	5.	Let water settle before drinking.		
	6.	Use of alum crystal to disinfect.		
	7.	Other.		

H008	**Note**: **Investigate** availability of storage for **drinking water**. Is the water container clean (no algae seen)?			
	1.	Yes.		
	2.	No.		

H009	What is used for defecation? Choose one of the following. **Verify** existence of facilities and practices.			
	1.	Toilet – equipped with flush mechanism to wash water down.		
	2.	Toilet – uncovered pit.		
	3.	Toilet – simple dry covered pit.		
	4.	Outdoors in the open air (in fields, for example).		
	5.	Other: specify -		

H010	When do you clean your hands with soap, ashes, dust, tree leaves, or any other material? Place a check mark for each answer said by the respondent. **Do not give the respondent any choices for the answer.**					
	a.	After using the toilet.	1.	Yes		
			2.	No		
	b.	Before eating.	1.	Yes		
			2.	No		
	c.	After eating.	1.	Yes		
			2.	No		
	d.	Before cooking.	1.	Yes		
			2.	No		
	e.	Before feeding the child.	1.	Yes		
			2.	No		
	f.	After disposing of child's waste.	1.	Yes		
			2.	No		
	g.	After cleaning the livestock or poultry areas.	1.	Yes		
			2.	No		
	h.	Any other answers: Specify -				

H011	Note: With regard to hand-washing, confirm the use of the following:					
	a.	Water.	1.	Yes		
			2.	No		
	b.	Soap.	1.	Yes		
			2.	No		
	c.	Ashes, dust, limestone powder, tree leaves.	1.	Yes		
			2.	No		

H012a	Where do you obtain health care if someone in the household gets sick?			Go to
	1.	No medical help is sought.		
	2.	Personal medicines.		
	3.	Traditional healer.		
	4.	Shaykh.		
	5.	Pharmacy.		
	6.	Private clinic.		→H013
	7.	Public health facility.		→H013

H012b	Why don't you seek health services at a health facility or clinic when someone gets sick?			
	1.	High cost.		
	2.	Facility is distant and transportation is not available.		
	3.	Not enough time.		
	4.	We do not have confidence in the nearby services.		
	5.	Other: specify -		

Q013 – Q017: The food security situation part (to be answered for the situation in the past 30 days)

H013	Over the past 30 days, did you or any HH member use to reduce the size of meals because of the scarcity of resources?			
	1.	Yes		
	2.	No		

H014	Over the past 30 days, did you or any HH member use to reduce the number of meals because of the scarcity of resources?			
	1.	Yes		
	2.	No		

H015	Over the past 30 days, did you or any HH member go the bed in night hungry because of not enough food?			
	1.	Yes		
	2.	No		

H016	Over the past 30 days, did the HH borrow food, borrow money to purchase food or purchase food in credit or mortgage **only if the reason that HH has not money**?			
	1.	Yes		
	2.	No		

H017	Over the past 30 days, did the HH reduce the expenditure on education or food to save money to purchase food?			
	1.	Yes		
	2.	No		

Q018: Situation of salt iodisation

H018	Use the rapid test reagent to check the iodisation status of the salt HH was used yesterday?			
	1.	Not iodised.		
	2.	Below 15 ppm.		
	3.	15 ppm and above.		
	4.	The test was not made.		

Q019 – Q025: Nutritional and Immunization Status of Children ages 6-59 months within the household

		C019	C020a	C020b	C021	C022a
Child no.	Child's first name	Child's gender 1 = male 2 = female	Date of birth. If the date is recorded, skip C020b)	Age of child in months. If the child is older than 24 months, go to question C023.	For children 24 months or less. Is the child still breastfeeding? 1 = yes 2 = no	For children 24 months or less. How many times have you fed the child in the past 24 hours? Do not include number of times breastfed.
1.			Day mo. Year			
2.			Day mo. Year			
3.			Day mo. Year			
4.			Day mo. Year			
5.			Day mo. year			
6.			Day mo. year			
7.			Day mo. year			

			C022b	**C023**	**C024**	**C025**
Child no. (as above)	Child's gender 1 = male 2 = female	Child's age (in months)	For children 24 months or less. How many times have you fed the child milk in the last 24 hours? Do not include number of times breastfed.	Has the child been given Vitamin A in the past six months? (Show sample.) 1 = yes 2 = no 3 = don't know	Has the child been given vaccinations for Pentavalent 3 and Polio 3? 1 = yes 2 = no	For children nine months and older. Has the child been immunized against measles (shot in left arm)? 1 = yes, shown on card 2 = yes, from memory 3 = don't know 4 = has not been immunized
1.						
2.						
3.						
4.						
5.						
6.						
7.						

Q026 – Q035: Anthropometric measurements and childhood diseases of children aged 6 – 59 years in the household

			C026	**C027**	**C028**	**C029**
Child no. (as above)	Child's gender 1 = male 2 = female	Child's age (in months)	Weight (kg) 88.8 = refused 99.9 = not present	Height (cm) 888.8 = refused 999.9 = not present	Bilateral edema (in both legs). 1 = yes 2 = no 8 = refused 9 = not present	Middle upper arm circumference (cm) 88.8 = refused 99.9 = not present
1.						
2.						
3.						
4.						
5.						
6.						
7.						

			C030	C031	C032	C033	C034	C035
Child no. (as above)	Child's gender 1 = male 2 = female	Child's age (in months)	Diarrhea within the past two weeks 1 = yes 2 = no	Cough or difficulty breathing in the past two weeks 1 = yes 2 = no	Fever in the past two weeks 1 = yes 2 = no	Symptoms similar to measles in past month (skin rash + fever + cough or throat infection or conjunctivitis) 1 = yes 2 = no	Did the child sleep under mosquito net last night? 1 = yes 2 = no	Is the child currently registered at a nutrition center? 1 = SFP 2 = TFC/SC 3 = OTP 4 = other 5 = not registered
1.								
2.								
3.								
4.								
5.								
6.								
7.								

Nutritional Status and Mortality – Ibb Governorate, Nov – Dec 2012

Individual household members monitoring form for the 90 days following survey commencement date (Form 2)

District surveyed: _____ Village/neighborhood: _____ Date: _____ Cluster number: _____
Team number: _____ Household questionnaire number: _____ Survey zone (stratum): _____

No.	Name (optional)	Sex (M, F)	Age in years	Joined within the 90 day period	Left within the 90 day period	Born within the 90 day period	Died within the 90 day period	Cause of death	Place of death
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Important: All individuals present in the household should be recorded, whether joining or leaving the household, and whether born or died within the 90 day period from commencement of the survey.

Symbols for causes of death	
1 = diarrheal disease	5 = malnutrition
2 = fever	6 = violence / impacts of conflicts
3 = measles	7 = other (specify)
4 = respiration disorders	

Symbols for places of death
1 = at the current location
2 = during emigration
3 = at a different residence
4 = other (specify)

Annex 3: Ibb Nutrition Survey Team, 24 November to 6 December 2012

Team No	Survey Team	Position	Duty Station
1	Basheer Mohammed Ismail **(Team Leader)**	Ibb GHO	
	Aswan Hasan Al-Homaiqani	Taiz	
	Deena Mohammed Al-Faqeeh	Dar AlSharaf - AlMashana	
	Ahlam Mohammed Abdo	Dar AlSharaf - AlMashana	
2	Fuad Abdulkareem Annuzaili **(Team Leader)**	AlThawra Hos. - Ibb	
	Tahani Mohammed Abdulwahab	Taiz	
	Laila Saeed	AlThawra Hos. - Ibb	
	Asma Awadh Ali	Jebla	
3	Faisal Hazza Ahmed **(Team Leader)**	Ibb GHO	
	Intidhar Abdo Mohammed	Taiz	
	Fathia abdulrahman al-Shama	Motherhood Hos. – Ibb	
	Lamia Hassan Abdulrazza	Rehap Hos. - AlQafr	
4	Mohammed Abdullah Farea **(Team Leader)**	Ibb Rural District	
	Zohoor Mohammed Nagi	Taiz	
	Najla Hamood Al-Eryani	Rehap Hos. - AlQafr	
	Rabab Hamood Al-Ameri	Dar AlSharaf - AlMashana	
5	Mohammed Hasan Al-Nofi **(Team Leader)**	Ibb GHO	
	Asia Marech Ali	Taiz	
	Ahlam Ahmed Ali	Ibb Rural Dist	
	Ikhtiar Hamood Al-Harethi	Dar Habba - AlMakhader	
6	Motee' Ali Al-Baghdadi**(Team Leader)**	Ibb GHO	
	Afrah Ibraheem Mohammed	Taiz	
	Zainab Qaied Mohsen	AlUdain Hosp	
	Asmahan Saeed Mohammed Qaied	Taiz	
	Data Entry team		
	Abdullah abdulKareem Al-Ansi	Ibb GHO	
	Khaled Saad	Ibb GHO	
	Omar Al-Qarhazi	Ibb GHO	
	Zakaria Al-Salahi	Ibb GHO	
	Logistics		
	Dr. Nabeel Abdulkareem Annuzaili	Ibb GHO	
	Survey Technical Supervisors		
	Dr. Mansour Mohammed Ghaleb	Nutrition Dept	MoPHP – Sana'a
	Nassar Hamood Al-Ashwal	Nutrition Dept	MoPHP – Sana'a
	Abdulmalik Abdullah Al-Qessi		GHO - Amran

	Abdullah Khadem Al-Aqzal		Alluhia-Hodeidah
	Survey Manager		
	Waleed Abdulmalek Al-Madhaji	CH Dept	MoPHP – Sana'a
	Technical Advisor and data verification		
	Nagib Abdulbaqi Ali	Nutrition Specialist	UNICEF – Sana'a
	Data Analysis and Report Writing		
	Prof. Abdulwahed Al-Serouri	SMART Consultant	UNICEF – Sana'a

Annex 4: Ibb Nutrition Survey Standardization Test Report for Evaluation of Enumerators

Report for Evaluation of Enumerators

Weight:

	Precision: Sum of Square [W2-W1]	Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.03		3/0	
Enumerator 1	0.48 POOR	0.39 POOR	2/3	4/3
Enumerator 2	0.42 POOR	0.35 POOR	5/3	8/0
Enumerator 3	0.05 OK	0.38 POOR	4/1	2/6
Enumerator 4	0.39 POOR	0.20 POOR	6/1	6/2
Enumerator 5	0.21 POOR	0.38 POOR	5/1	8/0
Enumerator 6	0.30 POOR	0.65 POOR	4/0	0/9
Enumerator 7	0.57 POOR	0.54 POOR	4/2	5/3

Height:

	Precision: Sum of Square [H2-H1]	Accuracy: Sum of Square [Superv.(H1+H2)-Enum.(H1+H2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.81		9/0	
Enumerator 1	0.89 OK	3.08 POOR	5/1	5/4
Enumerator 2	3.06 POOR	2.93 POOR	4/4	2/7
Enumerator 3	0.90 OK	3.03 POOR	6/4	7/2
Enumerator 4	2.20 POOR	8.47 POOR	4/5	2/7
Enumerator 5	17.97 POOR	12.06 POOR	9/1	3/7
Enumerator 6	108.33 POOR	94.46 POOR	5/2	6/4
Enumerator 7	1.98 POOR	2.19 OK	4/4	4/5

MUAC:

	Precision: Sum of Square [MUAC2-MUAC1]	Accuracy: Sum of Square [Superv.(MUAC1+MUAC2)-Enum.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	3.00		2/1	
Enumerator 1	997.00 POOR	760.00 POOR	4/2	5/5
Enumerator 2	186.00 POOR	173.00 POOR	6/4	7/1
Enumerator 3	83.00 POOR	84.00 POOR	1/6	8/2
Enumerator 4	48.00 POOR	317.00 POOR	3/5	9/0
Enumerator 5	75.00 POOR	60.00 POOR	5/2	1/7
Enumerator 6	48.00 POOR	349.00 POOR	6/2	0/10
Enumerator 7	61.00 POOR	94.00 POOR	2/5	1/9

Annex 5: Reference Table for Age Estimation

جدول الاحداث الزمنيه بمحافظة اب

م	الحدث	التاريخ
1	شهر رمضان	شهر 9 من الاشهر الهجريه
2	عيد الفطر	1- شوال
3	عيد الاضحى	10 ذي الحجه
4	الشعبانيه	15 شعبان
5	جمعة رجب	اول جمعه من شهر رجب
6	يوم حادثه دار الرئاسة	5 يونيو 2011
7	جريمه مقتل الرعوي في سجن المباحث في اب	15 / اكتوبر 2007
8	جريمة قتل امام الجامع الكبير في اب	5-2-2009 م
9	جمعة الكرامة	2011-3-18
10	محرقة ساحة الحرية تعز	2012-5-28

Annex 6: Cluster Sampling for Eastern Highlands

City/ Village	Ozla	District	Cluster No
Meelyban	Roa‘aeen	Yareem	1
Alakamah	Bany Omar	Yareem	2
Almaraheb	Eereyab	Yareem	3
Almodha‹a	Bany Qaees	Aradhmah	4
Di Al Sola‹a Alsoflea	Kohlan	Aradhmah	5
Di Sha‹abah	Yaheer	Aradhmah	6
Bait Basheer	Al-Sharnamah Alolya	Al-Nadera	7
Al-Naobah	Al-Meftah Ala‹ala	Al-Nadera	8
Manzel Alsharaf	Al-Amlook	Al-Sha‹ar	9
Assadah	Wadi Haggag	Assadah	10
Bait Ma‹azab	Gabal Esam	Assadah	11
Al-Mehfan	Al-Thawabi	Geeblah	12
Al-Ma‹abaree	Woraf	Geeblah	13
Assarwah	Al-Rabadee	Geeblah	14
Qareat Alma‹aeen	Geeblah	Geeblah	15
Al-Mahlaa	Al-Harth	Ba‹adan	16
Khawalah Wa Asserat	Bany Awadh	Ba‹adan	17
Assabal	Al-haeeth	Ba‹adan	18
Assehar	Belad Algoma‹aee	Assabrah	19
Aden Mehlaq	Aeenan	Assabrah	20
Mgran	Adaamegh	Asseyani	21
Al-mea‹azab	Ameed Adakhel	Asseyani	22
Di Alhabr	Al-hades	Asseyani	23
Mhadeb	Anamer Asfal	Al-Mashanah	24
Ibb Al-gabanah Aloolea‹a	Al-Mashanah	Al-Mashanah	25
Ibb aAsheea‹ab	Al-Mashanah	Al-Mashanah	26
Ibb Garafah	Addehar	Addehar	27
Ibb Kaheb	Addehar	Addehar	28
Ibb Ahwal Ramadan	Addehar	Addehar	29
Ibb Almadrabah	Addehar	Addehar	30
Di Gadelah	Thwab Al-asfal	Addehar	31
Al-Manakh	Maeetam	IBB	32
Adhfdhf	Al-maqaten	IBB	33
Gabal Barat	Gabal Moa‹awed	IBB	34
Qoraedhah Asofla	Shea‹ab Yafea‹a	IBB	35
Saeelah Al-a‹aeen	Bani Madsam	IBB	36

City/ Village	Ozla	District	Cluster No
Yareem Ashagarah	Yareem	Yareem	RC
Bani Msa‹aood	Khawdan	Yareem	RC
Khrabat Taher	Ala‹amas	Assadah	RC
Al-a‹ashwah	Attorbah	Assabrah	RC

Annex 7: Cluster Sampling for Ibb Western Highlands

City/ Village	Ozla	District	Cluster No
Al-Mqasemah	Bani Saif Al aʿali	Al-qafr	1
Al-Maʿazebah	Bani Omar Assafil	Al-qafr	2
Madhaj Assafil	Mdhajain	Al-qafr	3
Al-hadedah	Assahool	Al-Makhader	4
Al-wataah	Assahool	Al-Makhader	5
Assalolah	Alwadi	Al-Makhader	6
Alkadaked	Bani Saraha	Al-Makhader	7
Dholmah	Robaʿa Dholmah	Hobaeesh	8
Al-Mkafesah	Bani Aldhahateen	Hobaeesh	9
Al-Mahjar	Shobaaʿa	Hobaeesh	10
Al-Farawi	Assadr	Hobaeesh	11
Wadi Moaʿah	Hokaeen	Hasm Alodaeen	12
Al-Aʿamood	Al-Abaʿaoon	Hasm Alodaeen	13
Al-waqaʿah	Assaedam	Hasm Alodaeen	14
Wadi Hana	Al-asboor	Hasm Alodaeen	15
Al-ghareb	Al-Ahmool	Faraʿa Alodaeen	16
Al-Hagaf	Al-aʿaqebah	Faraʿa Alodaeen	17
Al-Raheedah	Al-Wazerah	Faraʿa Alodaeen	18
Al-Robaʿa Al aʿalee	Al-gadhaeebah	Al-Odaeen	19
Al-Maʿabar	Aʿaraden	Al-Odaeen	20
Wadi Shoraet	Blad Almolaeeki	Al-Odaeen	21
Baraha Alolea	Al-Gabaleen	Al-Odaeen	22
Al-Haweah	Qasal	Al-Odaeen	23
Dar Omaeer	Qosaʿa Heelyan	Al-Odaeen	24
Al-Kareef	Assarah	Al-Odaeen	25
Moaʿaeen	Di Alhood wa moaʿaeen	Di Assofal	26
Al-markabah	Bani Abdallah	Di Assofal	27
Al-lefgaeen	Al-dekhal	Di Assofal	28
Al-qaeedah nagd allah akbar	Khonwah	Di Assofal	29
Al-qaeedah 26 septamber	Khonwah	Di Assofal	30
Aʿaeeblal	Khonwah	Di Assofal	31
Al-karabah	Wadi dhiea	Di Assofal	32
Al-ozlah	Al-gawaleh	Modaeekherah	33
Alreas	Homaeer	Modaeekherah	34
Asharqee	Alashaʿaoob	Modaeekherah	35
Al-mazhar	Almazhar	Modaeekherah	36

City/ Village	Ozla	District	Cluster No
Bait Alnegree	Bani mosalam	Al-qafr	RC
Alshelah	Almea‹ashar	Al-Makhader	RC
Aden Mesqal	Naqeel Aloqab	Hobaeesh	RC
Armadee	Alakhmas	Fara‹a Alodaeen	RC

Annex 8: Sampling Frame of Ibb Eastern Highlands

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
يريم-الأسلاف	497	مليان	2090	العارضه	127
يريم-المعسكر	1637	مرس	3189	بسر	712
يريم-حاره 7يوليو	469	الشصر	434	الجدد وصرواح	531
يريم-الصلول	791	القدمه	1248	عيانه	198
يريم-نجد بلس	463	الواسطة	655	لحجه	50
يريم-اللفايا	842	حنفل	1378	المداري	95
يريم-طمحان	979	دماس	938	درام	215
يريم-درم المعبري	1117	بني ساري	717	الطلب	66
يريم-تبة التويتي	320	قعيقعان	1227	خرابة حصن الباز	58
يريم-عاكر	255	بيت الشامي	307	ذى اهلول	1163
يريم-الملعب	447	ماور	3614	الخربه	920
يريم-جبوبة مرة	2934	القرن	321	الجرين	1077
يريم-المرباع	550	المقداحه	435	سنب	1020
يريم-الخشبة	3080	بيت السفياني	1011	الضربه	1067
يريم-المصلى	1882	بيت البعم	332	ذي حيوه	251
يريم-قسم قمري	517	رباط الرميشي	1048	الجبه	1230
يريم-حاره قبة الشفاء	174	العر	515	مجعه	766
يريم-المشناقه العليا	437	العريش	321	الغول	644
يريم-باب صنعاء	849	مرسع	1018	رخمة المصري	184
يريم-المجنه العليا	178	الهجره	611	وعر	378
يريم-مدرسة يحصب	278	الحرف	808	اقراض	373
يريم-جامع الوتاري	784	بلسان	1482	حبابه	475
يريم-المجنة	153	بني قاسم	373	العدن	288
يريم-الخنساء	979	المنشر	282	سروه	151
يريم-العشة	997	الجرداء	1219	الحيمه	214
يريم-المرايم	7080	الخرابه	1609	الخربه	758
يريم-حارة الكهرباء	93	البلد	1747	العشه	472
يريم-الشجرة	2535	جبل مطير	2113	العارضه	386
يريم-باب اليمن	569	الجبوبه	252	عيوم	1381
يريم-الحبس	227	ذي صارف	2531	صنصل	405
يريم-المشناقة السفلى	1121	لكمه خيران	432	الهجره	455
يريم-الخان	1020	المرقب	332	بيت الدعوس	912
يريم-جامع الحبس	295	بني غبس	657	صرحه	1005
يريم-الرشيديه	419	المنازل	426	لكمة الصوفي	1210
يريم-السبحة العليا	612	العدوف	347	سحمر	1082
يريم-السبحة السفلى	1884	الحسور	428	القله	366
يريم-الميفعة	147	الحرو والطلب	272	قطن	265
يريم-اللمعة	169	الهجره	386	السبله	152
يريم-الدحاح	177	الخرابه	566	الساري	1089
يريم-القلعة	191	سوق الخميس	162	ذي حرمان	280
يريم-الشارع الطويل	325	قرن علامه	193	ذي مشمر	157
يريم-السوق القديم	219	بيت الشحطره	372	الجربتين	267
يريم-حاره الميدان	398	حصن الشرف	394	باب المبرك	231
يريم-الشعري	742	الكمه	326	عسيق	79
يريم-النويدرة	535	رخمة العمال	75	المزرعه	68
يريم-المناخ	636	الشقاحي	388	حديدة	64
يريم-قرية اليهود	266	اذهاب	363	الرزاعي	371
يريم-المصبانة العليا	176	شعر	571	حجر ادهان	395
يريم-العقبة	334	بيت ربيد	676	طنبان	366
يريم-جبل عبدة	547	العيان	582	جروه	754
يريم-حاره السمانة	710	طنبه والعدنه	251	المحيب	1374
يريم-حاره المشهد	5586	الصافيه	116	المحفد	1281
يريم-فرزة الرضمة	247	البلسي	119	تلباس	477
يريم-المركز المهني	744	خلل	479	الشكامي	799
يريم-باب حفر	841	البلد	273	الرعادي	1124
يريم-حارة الزراجي	3263	الاعكاى	692	قرية خودان	587
يريم-الضورين	213	حصن قرون	149	الذراع	743
يريم- باب الضورين	2231	الجبل السفلى	609	بني مسعود	990
يريم-شعب الماء	631	النوب	165	العارضه	942
خاو	6502	بيت راشد	187	بلاله	782
سنفان	4385	مسحله	289	عبر الماء	353

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الحياضي	1329	المنقّل	81	بيت عدنه	480
الركب	745	الجلب	401	جرف الحمام	785
القّداري	1009	بيت كنداش	541	بيت حنيش	33
الجبجب	865	بيت النويرة	162	حبلة الجرادي	783
الشماري	291	نايس	378	ذى الصولع السفلى	1518
المنزل القديم	3582	دفان الوادي	217	ذى الصولع العليا	1770
الجرجره	652	عكدان	477	العجمه	263
بعلان	308	الذاري	98	بيت محمود	448
بيت العماري	400	اللكيمه	152	القدمه	652
الحصين	2051	الجباجبه	387	بيت الواقدي	52
ذمران	4655	المعصره	87	الهجره	16
رباط الشعري	2985	بيت النطاح	53	الملاحه	613
الجرف	313	عباهه	308	منيف	581
رباط القلعه	4458	جربة البيت	54	حرمه	620
ذلمان	415	الحزه العليا	500	غيلي النجار	359
الاكسود	362	بيدحه	332	الغيلي الحيظاني	296
ماوه	1049	الحصن	306	هجاره	336
بيت العباب	319	رباطالمصرع	677	بيت الورد	355
نجد العزب	139	بيح	359	بيت المحيا	385
منكث	1766	الشماري	549	المعاين	300
ذي شميران	596	ارجب	166	الديارة	424
عرب	1054	مدين	186	حجل	746
دخلة عويدين	2591	الغشه	60	الخربه	220
الحياف	23	الخربه	394	بيت الذيباني السفلى	631
المنزل الجديد	908	الرضمة	5401	المعزبه	706
الشعوب	1678	الكتبه	2384	جرف كلان	556
المسقف	88	الموضع	532	هامه	193
المنظر	202	الصرم	1858	الصلفاح	424
بيت عباس	586	الجوران	1737	المشرف	487
المراحب	1391	الحرف	1879	العرينة	615
الفرجدي	895	بيت مغنيز	981	بيت فقير الشيخ	287
حليل	660	المنجر	1417	ثمار	613
ذى خولان	369	الذاري	1653	مذكم	732
العر	265	المنصوره	1516	السرفي	1113
عضة	844	القوفعه	1428	سهوان	282
ذارواح	349	قبلي	1635	المنزل	433
العزازي	1286	الصبار	2101	ذى عباده	665
دفان الجبل	290	حرف العمرى	1067	شعب العبيدي	467
ذي الحرسه	145	القحيزه	684	التربه عمار	1057
عقد	369	عميقة	607	بيت الحنش	352
ذي يصرب	302	بيت ابو عسر الاعلى	336	التويره	328
الدرب	850	النجد الاحمر	726	المصنعه	505
بيت هديان	267	ذرو	985	الخرابه	609
المخرف	132	ذي حشران	393	الاجلب	4026
جرف الزنح	236	مزيح	1163	بيت البدري	201
بيت الشامي	108	همدان	708	بيت بدر	438
المزرعه	73	بيت القهبري	752	بيت سيدم	337
ذراع الشعب	34	المطلاح	544	هير	871
العارضه	79	بيت العشاوي	862	ذالحبيب	306
الحزه السفلى	1861	بيت المقبلى	656	اضمده	99
الضبر(بيت ثوابه)	400	الصومعه	226	الخربه	612
شهصان	736	القفله	307	مسوره	353
الدريعا	1231	قرعد	2093	شعب السنف	650
دخلة المسالمه	1932	ذي يعلل	926	المورح	934
الخربه	607	حصن كحلان	491	دار سودان	935
شنبان	252	بيت السباعيى	1374	(دار العنب)	528
كتاب	5729	الشياح	682	حيد الجروب	1384
رباط الاحكل	1012	شمضه	1105	ذى اشرع	3310
ذي مذايب	280	بيت الاقرع	1022	معزوب العزب	474
بيت عبسين	163	ذى لحيه	1355	الحديدة	290
بيت الهجيني	242	السواده	333	بيت عبده	451

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
بيت العباب	974	الحبيل الشاهري	758	خلقه	671
ذي شعبه	850	صابح	574	ظلم	583
(زبيد)	711	الضيعه	236	الجراف	338
موسد	967	طنب	393	بيت المضلع	519
بيت حميد	722	الجراب	528	زامح	168
الجرف الاعلى	453	الحبله	564	رباط زامح	537
الجرف الاسفل	680	اكرائي	632	ذي عرمان	186
بيت الزوم	470	سني	402	حبان	854
الخبانيه	1025	بيت الابروع	313	عذان	334
كوله باحاج	1573	ليلان	1006	الجبيب	958
بيت الحيدري	1804	خرابة البرطيس	650	الكستبه	211
موجر	183	الصيره	471	شعب	345
ضوس	192	المصلول	629	كوله النديش	1800
الضيق	350	بيت الصبل	539	داده	738
خربه الصياري	1374	الشرقه	509	ثمور	712
السكنه	550	المشهوث	289	الهجره	557
المدوره	269	النادرة	7846	رباط عمقه	606
مارش	896	السيد	277	عمقه	1116
الصوبة	994	بيت الراعي	234	عريب	464
ذي جهدم	507	ضكاعه	118	المقاسمه	272
شعب المريسي	1541	الجبجب	766	بيت الوعيل	1250
الثجر	645	دارعقده	461	بيت مشرح	1488
الدوير	718	جرف النمر	534	كهال	1512
وادي الردي	824	حريه	631	شعب غزال	310
الكوله	366	اللفح الاعلى	1033	الحرف	353
ذي راس	163	جحزان	891	الرضائي	2290
(صناع)	679	ذي غرابين	203	الشر يحيين	971
حبازه	353	بيت الزبيدي	280	مسورة احمد	537
ذي الدرب	1132	شريح	1554	الاخضري	307
جبوب النعمي	894	سحقان	819	الردى	955
شعبه السنف	502	بيت الهمزه	204	منزل المقرعي	430
الخربه	429	النصاب	572	الهلتى	270
الدروم	797	ذراح	308	روحان	1131
بقاعه	754	عجبان	173	المصواله	370
الحيفه	516	ذي عادد	561	ميدم	502
بيت القهمي	249	الكوبه	432	حقر	421
الوحيش	509	براقش	798	ثبة	597
بيت الوريصه	574	بيت البنا	558	مسورتيه	252
الصرم	661	بيت الماس السفلى	346	شرف النود	518
جدمان	347	نمران	575	المرادح	387
جرانه	254	المنزل	547	الاسباط	443
رباط صالح	238	اشمح	1288	جبوب نهشل	469
ثوم	87	بيت الدبيلي	213	الملحكي	780
سابيه	434	المقالح	862	حقيل	373
المنزل	530	الجلوب	766	رحة	772
العر	391	بيت الماس العليا	626	دارذى بر	567
نفيع	765	قذام	935	الحيفة	193
بسال	300	الخلل	502	اتم	513
المنقح	119	الخرابه	129	بيت القملي	208
ساره	137	الفجرة	210	الحدم صرم روحان	820
الخله	305	بيت الغزير	145	منزل الشرف	683
ذودان	1325	حفاف	963	منزل علوان	474
الظلل	446	الاعروم	717	ذى ناصر	476
بيت الصارم	586	ذي الشواح	227	المعراضه	869
قطن	403	النويه	845	ذى البرحة	981
بيت العزاني	1246	بيت عبيد	379	ذى الشامة	306
الشق	434	ذي قودان	905	البرحى	1386
دارسبره	651	مدار	1115	الظهبى	954
المحل	736	رباط الحواره	660	العروس	235
نشمان	681	الخشعه	1499	المشاذى	410
بيت بشير	2191	بيت السحيقي	711	الخضراء	216

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
خزران	392	عرم	200	مقوله	1003
اللكيمه	249	السده	6155	الجمري	985
العقرى	363	الخريب	403	بيت محرم	278
عدن	1068	ذي بلان	298	بيت المجذوب	167
المعدات	442	حده	414	بيت يحوق	682
سطيح	231	الدرم	162	بيت العميسي	67
الخراف	462	غيمان	181	بيت بهزر	306
ذى صيه	604	ذي صلل	849	عفار	424
العارضه	204	سوق الثلوث	1016	الجبل	271
المحرور	370	المنصاح	530	بيت عباد	760
عدن المحاقرة	394	عميقه	493	ظبية	174
المحاقره	328	بيت الاخضور	489	خرابة طاهر	374
ذى النمر	584	بيت الرعيني	505	بيت صالح مثني	553
جرعان	433	تبيح	201	بيت العولقي	360
ملكد	264	الشعز	866	خيذيان	276
الحبله	331	سواده	1060	معزوب الاشرم	250
منزل حوتر	126	الصربي	339	بيت عبدالكريم	434
بيت العشملي	282	حفزان	965	بيت الشامي	649
الدخله	1347	ذي الريد	600	الاغراب	1038
نجد حوشب	340	بيت الرداعي	979	بيت الرميصة	758
ذى الجحب	165	المسقه	1324	الخاسعة	490
حمي	51	نيعان	514	حوره	337
العدن	100	الدوير	214	نقيل البياض	360
الصفا	327	عدنه	150	الصيره	247
بيت الوائلي	211	نمله	908	بيت الراعي	180
شعب	260	الحرف	409	الاحواد	827
نقيل الشوحطي	407	الجراجر	313	بيت الفايق	842
بيت قرعه	546	ذي بقط	430	المواسك	186
بيت الديك	170	السور	298	الجوبل	331
الحجر	101	المنازل	966	المشر	117
ذى هرم	992	بيت اللبود	199	بيت الجحينه	46
الحرف	448	المذابب	383	الجدني	205
سامن	1101	الصول	303	المضباع	132
ذى مناحب	476	يداخ	221	القلعي	138
قبلان	465	جرف المولد	429	حدة غليس	1890
القرين	309	ذي شمار	210	المكعسين	370
السرقي	383	المعزبه	212	مخزق	258
العمقي	428	منزل غراب	753	بيت الريشة	208
الضيعه	390	الدنوه	752	خيله	329
رباط السريمه	1124	بيت علايه	564	قاشي	81
بيت الكبش	1246	ذي محانظ	320	خرابة صالح	544
ذى باهل	955	الخدره	563	بيت العائدي	379
محبران	778	الرياسي	1030	ذي جهد	205
نعمان	632	ذي هبور	755	بيت القعود	93
بدى	88	حقاب	200	الصيح	399
بيت القشمه	464	الجرجره	682	بيت السمة	216
دار الشجاع	501	ثعلان	214	الحيفة	204
ذى صريم	577	الجنح	394	ذي عملان	548
المحرس	78	ذي عسال	938	الاسلاف	241
المورع	209	دار التويتي	1412	رباط العثماني	1135
التبنيت	218	ذي الحبشي	439	جيدان	760
ذى رزن	994	النبيجه	300	شيعان	840
ثعلبان	336	المصنعه	646	عمام	810
الذراحي	304	دار سعيد	710	الضمادي	1451
ذحيض	273	جرف السفياني	686	جردد	455
رديع	278	شعب الطلب	600	السر	627
الحصن	65	ابعار	76	معود	450
المعزج	173	الزعلاء	238	كحله	462
جمعه	323	خوال	323	المصابيح	484
بيت الورد	387	بلد مسلم	190	عدن	216
اي ال	101	الاغبري	1260	ذي الدرم	575

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الرزاعي	351	شبل	618	رعيان	1087
مريوم	832	التوالّه	495	العقر	871
حجوان	215	المسيجيد	1032	الرشاحي	886
الدلاني	341	فحل	891	المعبري	2077
ذي تمار	261	صرمه	752	مظر	1945
ثعلان	369	السندف	1663	تؤاد	430
مابة	1078	اكمة عراف	416	جرن الجبل	933
الواطيه	1437	اكمة عبده	310	عبار	1550
الحوقري	515	المحداده السفلى	337	ذي عقيب	2536
الديمه	554	المابن	279	الثمد	448
رباط جوهر	332	اكمة الرهيش	395	الصلوله	1035
بيت الشامي في المرخام	1188	السهاله	808	الكريف	1321
الجرامز	415	جبل قماش	742	النجادي	471
بيت وحيش	355	عقرات	493	ديور وراف	413
بيت النسيم	411	محنب	401	ماجح	371
الضيعه	374	الشائس	180	الاكامه	962
ماور	199	الحجفه	627	المعطن	481
العدن	210	العرمه	772	المخامره	678
الهجر	211	العتمى	461	ذي عتام	324
صلي	331	عساب	1038	الاعدان	189
الضجام	280	المحفان	922	القرضي	113
الجليبي	307	نامه	549	انم	197
رباط العصبات	363	الميادنه	610	الجرانه	365
المعبر	568	الخورات	403	الفجره	230
خدار	448	النجد	519	يعكب	320
الحقلين	2147	المصيار	577	الحجار	201
بيت فائق	715	عليب	386	الاكام	195
بيت معزب	1229	الشجب	549	حاره	506
الجرين	276	الخزيجه	527	معيره	464
هجاره	496	الصال	982	العدفه	618
المقربه	669	المدرى	1142	مجرن	924
الخربه	279	بيت الجرادي	609	ذقاشه	518
بيت الغزيل	243	الكعز	596	ضرعان	657
ذي الجرف	800	الرباط	740	الصناع	374
بيت الجلعي	682	المنزل	1105	الجراجر	959
ظفار	492	المعاصر	1809	المنازله	1235
العرافة	2295	حجر كومره	843	حجابه	784
بيت الاشول	1750	الظهاره	791	وادي عبر	1308
خرابة زيد	827	أدام	955	الجحاف	1856
السيرة	369	شريان	954	جرن العدن	402
ذل هلباب	219	العدانه	618	عدن الحجر	417
بيت نصاري	566	الظهره	1153	الديم	357
جبل مسعود	299	شعفات	1073	جابر	378
جرف ناجي	390	الضباري	1099	الزواحل	403
ذي حريم	690	منزل حميد	648	الشرف	747
بيت حلبوب	2722	المناوير	1250	المجامله	281
جرن الدار	659	علاله	736	حجار الربادي	494
بيت الشقدري	444	سموع العليا	537	الشعب	535
الهجرة	222	العقاير	951	المقبل	1153
وسمان	1114	الظهره	1805	مائسه	365
المان	763	منزل مسعود	438	نفيل الاحروث	1701
الدثيه	861	سموع السفلي	498	البود	1914
بريح	420	اذن	1805	السروه	1462
عدن الكبر	592	المردع	871	الشمسيه	1266
القلعه	911	خطرة	1035	الخروف	237
مداره	337	عريب	388	بيت عبود	305
مشرب الحائره	585	ظرن	662	الخرف	1009
الدخله	562	الحيثجه	1766	العزازي	655
الشباح	899	المشاعبه	1389	المداه	348
حلين	310	دار الظهر	842	جبل حميد	1183
الصلاحف	886	منور	797	المقادمه	1613

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الصيرات	415	ذي نشم	735	الشعابي	248
السرايم	4484	رحبان العليا	414	الحجر	791
الطهابي	1601	رحبان السفلى	348	رباط الغيثي	606
الشياذع	1027	الظهره	432	مودن	939
عرشان	2718	حصن رقب	323	المزور	244
منازل بردان	2066	حقل	413	دار الظفر	266
ذنبه	1515	القبول	213	السور	421
بردان	1125	رقب	649	روين	478
جبلة	16077	النظاري	817	الدار الاسود	449
قرية المعين	657	خنيم	215	مزاحم	833
قرية المنصوره	343	المحيب	399	ذي الدم	541
التمره	1423	الجلبه	210	السناحي	2762
قرية الحرجم	1398	ميفع	769	المشراح	470
قرية المعطن	138	القدمه	428	الخربة	299
نؤاده	596	حصن العطاب الاعلى	308	اليعبائي	221
الجبجب	991	حصن العطاب الاسفل	189	الرباط	996
ذي حيفان	618	المحلا	846	الفجاجي	620
الحمادي	1500	الجمري	657	اغرب	1635
الحقيبي	414	المنزل	222	خواله والصيرات	1183
المحجر	333	الخرابه	390	دار الخزاعي	296
دار الحرف	467	ضواع	241	السراح	1458
الفجره	311	نجد حنطام	758	المقلوع	518
ذي حصاحص	277	شعب الربيع	756	بيت العابلي	681
حيضان	463	الرصد	1772	ذي الرخام	693
الحرامي	514	العلهه	615	بيت القطيني	979
المسعن	342	ثرياده	667	العدن	847
يسير	237	بيت الوحيش	978	الخرابه	410
الخشابي	960	منعمه	978	شوحط	250
الغوضه	680	عرف	566	العله	236
ذي هذال	237	ثبث	582	منزل سري	348
جرن	463	عميق	965	الاكمةالسفلى	210
ثاوله	357	جولبه	731	جاحه	833
المهدمي	198	اربان	389	جيران	356
عقد	422	القبع	603	ضامر الاسفل	266
مدين	369	سعوان	562	ظامر العليا	453
هوي	425	الخرشبه	170	عدن اشعر	206
بيت هريش	502	بيت الحنش	470	المقطن	286
الرجمه	672	مسوره	435	المناخ	392
الفراحي	972	الموجور	1045	الحذرير	289
الرباط	290	حزر	332	بيت الرباعي	243
ذكاره	277	شاهره	685	الثبيب	190
ذي الضرب	1214	ورفات	430	وشد	418
الشعيبة	755	عصيمه	210	صوحر	9
المناوب	743	الهرابي	145	الضباب	96
الديمة	499	نادب	711	المحدثه	202
بيت الدحان	198	ذي ناصر	219	العذارب	1861
مرار	581	بلسان	889	اباله اجرد	535
منيع	629	العسله	877	الجوش	123
بيت الحجري	843	الاظهر	419	دار القاضي	143
بيت السريحي	330	الصلوله	419	دار النمش	339
الجبوب	336	الخضبه	409	حسايه	113
سوق الاحد	786	سارات	518	السمنه	53
رهوان السفلى	682	عبل	255	النمص	342
رهوان العليا	537	المفخار	588	جحفل	152
المريس	1447	الحجيلي	206	الحديده	519
الجبائب	864	بيت الابلم	689	حمك	523
حرف الهرموز	476	ذهب	349	ظفار	360
العماهي	1574	اريكه	150	الحجفار	323
خربان	426	مسحل	595	بيار	708
دار الزواحي	383	الحرامص	661	الجلبين	126
حرف الزواحي	439	الدهماء	200	الصليعي	200

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
قرية المركز	4626	المريم	258	الصوبان	1243
الاسالم	700	المشاعر	604	بني ويس	267
الرباط	289	الرباعي	1068	الحود	2050
النباهي	185	القرين	1317	الشاجبه	1229
الدعيس	718	بيت شحره	537	القرين	951
بيت البعداني	1391	الظهره	370	العريش	219
السروه	335	طبيع	1309	العنبره	281
مراره	788	سوق الثلوث	1545	القفل	1311
المقاضب	651	مرقح	1081	الدمينه	789
منزل حميد	984	المنزل العلياء	639	الرخمه	1594
النزهه	130	سير	1269	ذوعصل	1582
الرقامي عبدالله	496	المحاورة	463	عدن محلاق	1597
الرقامي د حبيل	441	بيت الجديد	743	غضار	900
دار النقيل	222	ذي البارات	451	الاشعاب	559
عرهان	536	الجنافي	275	الذراع	574
حصن الحداد	298	ذي قحم	1565	المنزل	602
الحجؤ	331	منقذة	1137	الضلاع	735
منزل داعر	380	نجد الجماعي	3624	كبار	605
منزل عباس	238	الاكيمه	923	ذي فريع	582
بيت امير الدين	197	الصيحار	2926	نجد المحطه	509
القحزة	273	ابيب العليا	590	اللجع	2331
الحيث	615	الحبيل	210	رباط البرير	1009
شعابة	291	جري جماعي	366	رباط الاحزوم	915
نبل	447	الحقل	919	شايب	1691
المدهف	277	مطايه	1021	خيران	459
هيجة فارع	165	منزل على	1160	الجرف	1935
الدمنه	502	الكرب	516	المصانع	741
الصافيه	621	جاعره السفلى	348	الحجريه	1822
الخربه	635	عرض الاعور	391	الهوبه	1710
المظره	451	حسل	558	سيره بني عاطف	1075
المعقاب	390	حلاكه	746	السوائل	885
حيفة السويدي	342	المحباب	64	الجاح الازهور	613
السبل	1193	ذي جرادة	399	وادي العمرالازهور	401
جرانة	1465	المحاط	606	تربه الازهور	1051
يعمد	431	منزل الطاحون	1286	حبيل المريم	1406
الرباط	184	القرضي	544	ذي البليس	405
الجحشين	963	سبره	703	احوال قيس	941
بلاح	604	الدجاج	905	عشب	851
الاحواد	113	اللحج	410	وادي الصراح	934
الخرشبه	214	جري عروان	908	ادمات	1792
ميثب	280	الشراحي	247	حجر	1004
المنازل	555	سالفون	813	المعقده	1249
ذي عفور	532	جدابه	683	الجرفه	695
الجوبلي	624	الشياعي	781	السحيه	892
حده	868	منعم	1410	المدهاره	675
ساره	587	ذي عدن	596	شمسان	439
وراء	532	الاصمين	1292	دار السمايا	1326
حدابه	465	حبيل الدار	444	التربه	1127
رباط شجاع الدين	228	بيت العداش	1022	المقيرة	1067
خرابة مروه	249	جبالحود	86	العشوه	2124
نبت	369	السلقع	675	السياني	2713
عازب	607	رجيعه	293	ضراس السفلى	4372
خرابةعدانه	318	الريامه	779	الصنين	185
حبيل عدانه	662	الشقات	1032	جلب	1031
رباط علي بن حسين	195	الغبيراء	353	الخريب	550
السناحي	788	القبه	597	ضراس العليا	646
الوطئه	1201	الموجر	61	منزل نخلان	1068
تهوف	802	الجوارف	704	الظهره	1182
الصيرات	584	بيت العودي	464	الجرفات	1059
عثد	378	المقهايه	794	برعات	877
ضابي	660	حبيل السوق	325	ذي شراق	3084

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الظرافه	1230	خبائه	745	الخرابه	265
جحب	739	الدارض	733	الدهنه	344
ذي المحاسن	2126	الحميراء	345	الحويدين	280
منزل الرباعي	425	سبات	1030	الاشعاب	436
جحذره	361	ابهار	1788	المعزبه	690
بيت الرعاوي	160	القريعا	949	جزحان	549
ذي الوسع	628	الظفير	612	ذي القرض	693
السحب	1684	الصيرات	632	تلعقه	426
الجرذم	565	المعزاب	848	العريش	1079
رقاد	657	المصينعه	851	مصاوره	250
ذي المحمر	351	الحقلين	1146	الجرافه	437
نوابه	424	وادي سير	225	الضيعه	404
جناد	1171	الشعوبه	460	النهوى	476
فلعه	145	الدراني	198	ادول	548
منزل الساده	757	الجامع	233	قتر	518
الملونه	255	الرعاس	1390	وادي وش	1213
مرعه	1718	العداري	1038	حبيل هدوان	712
الرزم	249	رديع	1279	الكزله	363
العرش	558	شعب القاضي	271	مجدب	519
الدار	1215	جبل حود	899	الزرائب	1725
ذي نعوم	841	سنب	765	المحلاثي	258
ذي حريمات	1009	حضاره	1068	الكباب	228
حمومه	798	المسالقه	828	الظوهار العليا	336
عثارب	827	الجوازع	3555	المشيرعه	1079
مربت	433	العبره	1345	الصرم	807
السهق	499	المجعاره	1524	غربه	304
مجرن	1220	محطب	3068	شعب القريه	376
منزل السماوي	1027	النجاد	1921	منزل الرعيه	1175
عدن الاشلوح	2186	النجد الاحمر	1230	منزل الشعبة	425
الذراع	1141	المعافد	102	العقر	387
يعدش	776	الدخلة	1870	ذى الشاط	826
عشه	597	حذذ	700	دار العلفى	378
وعل	678	عدن جود	1383	ذى حشمط	583
الاخطور	657	الخمعي	765	الناقل	1324
دار الجبل	849	الكمادي	203	الرظمه	314
النجيف	1080	عتاب	319	الواسطه	490
ذي عامر شملان	1015	الصيرات	640	المعزبه	545
منزل جميع	334	الجيئات	324	منزل قعيش	618
دار القضاة	826	العقير	587	المندم	405
منزل الفقيه	1000	ذراع مكابس	508	الدحثات	2577
منزل السوق	1210	الرباط	240	عياد	2892
ادنه الغبرا	122	الذنبه	706	الدحثات العليا	634
ريمه	210	السريح	865	اللحج	372
دار المعرجي	472	عطبه	640	الدحثات السفلى	697
جبل احشوء	351	منزل عيقري	1466	منزل خنيس	395
ميانق	605	منزل ابوبكر	1496	اخباب	424
الجنيد	693	اشار	538	محادب	1387
اللفج الاعلى	241	الشكامي	582	نجد العنصر	1395
ادنه البيضاء	177	الحبيل	204	أب	2228
اللفج الاسفل	52	ذي الحبر	585	أب-خميشع	656
الخضيراء	1498	العموقين	1761	أب-الراكزه	1068
قابع	1259	ذي الجرف	670	أب-الراكزه السفلى	1449
الحميراء	1450	ذي عامر	465	أب-المنظر الاسفل	1961
الظفاوه	833	المقطح	640	أب-المنظر الأسفل القبلي	783
الدمنه	3945	اللفج	82	أب-المنظر الاعلى	3574
حبيل الكور	1198	الهادس	222	أب-المنظر الأوسط	900
قحذان	774	الخرابه	167	أب-الكبسي	186
الشيخ صلاح	244	الذراع	46	أب-المركزي	228
الجرامعه	213	سالفون	629	أب-الحكومة	1443
السبره	954	الدحيه	1220	أب-الربادي	1176
قاشع	1096	معول	436	أب-البيحاني	780

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أب-عقيل	1296	أب-الصبط الشرقي	4339	ظهره الساده	325
أب-النمي	522	أب-الصبط	9715	المناخ	3820
أب-الجامع	843	أب-الظهرة العليا	5224	المقلوع	1920
أب-السوق القديم	1090	أب-الظهرة	4221	دار الغيل	204
أب-بني مفضل	877	أب-الظهرة السفلي	6733	ذي سود	2616
أب-الحمضي	350	أب-حارة السرويس	146	ذى عجزب	1627
أب-قشمر	604	أب-صلبة السيده	1359	الجاشه	1050
أب-الميدان	487	أب-المدريه	6772	عراجز	2276
أب-الجامع الكبير	387	أب-سوق الدعيس	666	موران	434
أب-موسى	214	أب-صلبة السيدة اروى	3767	سوق الثلوث	405
أب-الحمام	1096	أب-حرائة السفلى	1302	الجحله	1065
أب-المشهد	1376	أب-المزف	1199	النافش	680
أب-المجعارة	484	أب-الجزيرة	1192	المشراق	1949
أب-نماره	320	أب-جبل حرائة	5024	السلق	673
أب-المعقبة	3869	أب-جوبلة	4316	الجاح	1353
أب-المقري	503	أب-أكمة الصعفاني	4890	الضرائم	440
أب-المدقة	1324	أب-المكعدد	797	الخرابه	569
أب-الشيخ موسى	365	أب-عيقرة السفلى	1840	الساكن	577
أب-الجائه	1014	أب-قحزة	81	ذى صيله	309
أب-رأس الجائة	290	وقير	503	مصريات	195
أب-السماسر	352	ويخان	407	الرجمه	203
أب-الجبانة العليا	2977	الحمامي	2658	قاحان العليا	1054
أب-الجبانة الوسطى	5040	الغربيه	967	منزل حرف	866
أب-الجبانة السفلى	5585	منزل مشعر	588	المجنن	626
أب-الجبانة	513	العدن الاعلى	362	النوبه	715
أب-وادي الذهب	15116	العدن الاسفل	867	البرعات	1033
أب-مفرق ميتم	1667	الظبر	563	الجرجره	497
أب-الجمري	4694	المنزله	673	دار الشرف	688
أب-الشعاب	7432	نجد وهاس	694	هير	309
أب-الحرقة	400	المصينعه	300	قماله	636
أب	1185	سلاعه	576	العلايه	773
أب	24169	عسيق	596	شاكان	958
أب-دار القدسي العليا	260	ذى جادلة	601	الاكامي	485
أب-دار القدسي السفلى	322	العارضه العليا	1533	المحافر	721
أب-الذهوب	1772	مشعر	290	الحصن	1003
أب-احوال الثلاث السفلىشعبة اميره	878	صحري	453	المحجر	585
أب-احوال الثلاث العليا	2751	خباز	48	محضرة	485
أب-جرافة	6085	صل	986	الجائه	772
أب-الصراري	1645	العفاير	602	منزل موسي	739
أب-الخلقة	8839	بيوت العدن	3050	ذى حجنب	428
أب-جبل شجاع	2764	نعيمه	609	الحيمه	529
أب-جبل ربي	5485	المحصن	2235	قاحان السفلى	331
أب-إبلان الجديدة	1973	قحزه	2700	فروع	637
أب-إبلان	6833	مدر	1598	شذبان	1084
أب-شعبة المعاين	192	ذي عامره	956	العجابى	856
أب-المعاين	2485	الكداهي	1148	الضفضف	964
أب-عسم	1009	جبل حداد	1041	الجبجب	1196
أب-الحمامي الجديدة	788	عيقره العلياء	2028	الوهارى	417
أب-الجبجب	240	معيد	876	جبات	409
أب-النزهه العليا	291	منزل قاصد	1459	الضوالع	721
أب-النزهه	1925	عيقره السفلى	1768	حقله	1261
أب-نقيل الجزار	681	مشوره	2552	الجعاشي	1911
أب-كاحب	2641	الشجاف	874	بيت السريحى	1122
أب-السبل	7751	ذي حبيش	750	السوارى	589
أب-حارة الكهرباء	974	حير	690	الميدان	35
أب-حارة المرور	3640	الكحافى	1166	الصافيه	622
أب-مستشفى الثورة	2652	المعرن	1220	المعبر	1980
أب-الصبط الغربي	1357	خبائه	777	بيت مراد	1129
أب-الوازعيه	9361	الخربه	2059	جعران	873
أب-شعب المنيل	4164	المشعب	963	الشياحي	826
أب-احوال رمضان	8874	المشاعبه	1682	العارضه	427

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
دار المويه	772	الحرجه	355	ذى شعيره	258
ذعفه	1086	العراقى	192	ماتر	721
ذي سريره	1139	الجرابي	127	الضبر	522
المنظر	541	السره	333	المعاين	458
الشماحى	516	الظرائمه	178	المحاط	981
سكران	993	المدقه	275	السر	834
بيت الغبان	1059	العوادى	316	الشرنمه	676
بيت سعيد ناصر	809	نوابه العليا	320	الضبره	536
المربض	661	نوابه السفلى	557	نعمان الدارالاسفل	767
المحشايه	794	كسابه	387	الدنوه القبليه	1797
المحجر	319	الحجفه	1033	السهله	768
المصانع	482	العريش	1037	نقيل السنف	784
ذى كريب	501	طنبه	973	المعطن	201
المحل	426	المحدادة	735	الحولين	282
الصباحى	663	الجبجبه	445	القرات	613
عقد	1797	المعين	697	الفعاشي	650
الجميمه	1003	حصن بن شايع	1185	عدن مغربه	873
عليان	421	شعب الضيف	752	الجرنين	1034
العكفه	750	الجديد	369	الدقيقه	1067
العفيف	296	المرزوم	533	نقيل الدجري	794
منقذه	738	مواقع	468	الجبير	646
العر	767	الظاهر	542	الضحيكه	983
عشاي	672	ذى شيبه	482	الكريف	363
المنقل	409	ذى شيبه	126	حصايه	839
السمارى	463	ذى شيبه	113	سائله العين	697
عرض الجبوب	654	ذى شيبه	157	عدن الذيب	506
المحاشه	346	المحرقه	189	علياب	747
الشبر	747	الظهره	220	السليف	305
العدوف	1507	الفاش	328	الجبانه	847
المالح	858	المصانع	119	الربيض	1027
الولي	145	الدثثه	405	المغسال	807
الاحقري	639	الدثثه	257	منزل الركه	1072
جبل برط	1627	خرائب نصر	720	الشعب الداخل	596
المجدبه	382	القلعه	490	الشعب الكبير	367
الحجر	503	الضبه	570	الاكمه	458
الدخله	909	المرزوقه	304	عرش القيف	502
تبان	403	شعب الجمل	600	النجد	375
الرباط	722	صبل الكربه	538		
الجوز	2258	قريضة العليا	477		
الغراب	2291	قريضه السفلى	215		
الاسهوم	1588	المحل	255		
فراد	560	القرائي	384		
معري	175	القرائي	92		
بيت الجبل	268	ذى محيش	446		
محجر السيفي	241	العارضه	1085		
دارمرشد	508	الممسا الداخل	1998		
دار عماري	916	القيف	381		
المامح	596	اللفج	710		
هدام	507	سواد	1045		
المنجيه	629	جبل مشرقى	1224		
بعسنه	216	الحنامي	739		
السعديه	689	السهله	416		
وادى قضام	1135	الخرشبه	537		
جولةالسفلى	677	منزل الشعراني	1872		
جولة العليا	99	معريه	800		
المجمعه	1231	الذنيبه	543		
المحجر	972	المنائى	1022		
رجاح	581	المسوح	1836		
الخيراف	464	القبلي	1262		
ذى حمادة	140	صرعدد	1660		
المعبر	214	اليهاري	2044		

Annex 9: Sampling Frame of Ibb Western Highlands

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
رحاب	6159	السوفعي	950	الفواطم	482
بيت العلاف	652	صلاحيت	1139	المليلجه	322
بني جربان	2158	جماش	706	معينه	608
بقله	459	بيت سويد	695	نجد العسكري	80
بني شعيب	1262	بيت النجرى	609	الزوغه	61
السبل	1161	النزهة	566	الظهره	135
نجد البرح	2874	المحجر	162	الاقفال	218
قيدان	1251	المسوره	935	شعب القرو	34
بيت المرادي	496	العشر	737	عدانه	45
بيت الفاطمى	660	الشعابي	242	جبل عجابي	47
بني مفتاح	1448	ذي رقش	72	كمايه	149
بني معزب	522	حجر مشرفه	249	مسحامه	84
شبيت	762	دار الرميش	299	مدحج السافل	2175
راس النقيل	408	الحياء	219	مدحج العالي	1300
الظهرة العليا	314	دار الشعب	191	بيت الغماري	720
الحديدة	178	ذي العيان	93	ظهي	1910
القايس	300	الرفد	247	بيت الوادعي	1655
الصبره	300	الويلي السافل	226	شارجيه	2104
زره	228	يدعر	166	الرزع	1774
المعينه	1399	الويلي العالي	189	المغلق	986
الرماعه	985	الموردة	24	خدش	988
الجعشيشه	1103	المنزل	125	المسمر	496
هبران	266	بلاط	619	الظهره	742
المقاسمه	646	صحفه	348	قرقفان	766
عظالم	726	جبل شعله	174	الجماهرة	457
التزيبي	556	الحاقي	1330	فليح	706
الساتي	328	المظل	1492	الحبيل	1414
سطاح	622	الكوال	1686	ظهرة الكوفي	752
اريان	379	سمذان	2586	المضابي	356
نجد ريمان	465	بيت الاديب	3328	الغربي	1034
عنق	321	نمير	1379	السويق	901
الكناني	585	بني ناجي	930	الجبانه	1773
المنصت	596	بني مهدي	1164	المليحي	3392
حضار	333	العتبه	748	الحديده	1039
صفي	285	الظهيرة	778	المضمار	318
الرباط	231	بني عمران	292	سنين النوبه	1629
الميهال	372	مشرعه	1086	الرجاد	5298
مقرض	373	صيحان	3463	الدحتات	708
الدميم	417	المعازبه	2051	الصانعه	3001
عويل	581	المجانحة	2765	المنقوده	3220
البياحي	313	النكاع	2300	الحمري	1036
قبال	1206	السهلة	2498	الجداعيه	1829
الضبر	1371	المدير	1727	المحرث	2587
وقاح	1073	الحمروره	121	العارضة القديمه	5552
السهلة	1543	الضيق	752	الملحمة	299
الصنع	1611	قرينه	745	الظرمات	439
شيعان	2698	النمار	570	العراري	355
مذكران	659	النجد الابيض	230	الوطئه	171
الحيفه	181	حمرسه	362	الظهره	871
حوجم	130	الحصن والقلعه	944	دقار	322
بيت الجبري	233	السلفه	524	الزريبه	245
تالبة	736	حقته	542	منزل الطلح	870
بلد فليم	276	الغبيب السافل	1600	مسعود	546
ذي الحود	412	الغبيب العالي	2218	سنين القبه	812
الاصلاب	409	الشارصي	1364	المسجد	430
بيحان	495	الحشاشي	1639	عباد	85
رادات	200	المشاقب	724	الخربات	598
صبيره	417	الدهيسه	57	بيت عنان	725
الحبله	483	الدمنة	101	الجامع	567
ذي عدين	564	الربوه	52	ظهر الحمار	111
حيزان	210	الركب	280	الكوله	516

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
سمحان	1552	بضعه	1210	دحاء	312
الرباط	218	بيت الجعدي	626	اللميس	637
ظهرة السويق	289	بيت سليم	249	الحيضي	215
الناصرة	877	الارجب	325	القيه	327
حصن حجر	205	حروه	596	الخرابه	309
الظهره	508	دار حبه	1449	المشواف	261
منزل الشرف	249	التالفه	715	لكمه البدو	1061
جنود	365	بيت العماري	176	هريسه	1624
منزل حسن	378	النباهي	638	الحوش	1420
بيت الشنيني	163	الذياكي	1163	سحبان	524
ذي جندل	84	الحرد	860	دار الجبل	507
عرناج	194	الكنايه	581	المصينعه	3754
خيران	270	طناح	503	الدليل	1639
القرانه	213	حنعريب	671	النزهه	1419
ذي الجمل	250	وادي المنوار	767	الدمنه	144
حصن غندل	128	بيت واصل	237	الصلب	257
ذي حقل	188	كلال	380	الكداكد	1452
الحيفة	162	نبال	788	البصير	684
الافواخ	425	كروه الامير	349	حصب	528
جبجب همال	272	الدور العليا	526	رهيش	1253
ماره	245	صاران	602	العزله	1068
النجد	278	بني قتره	432	الضبات	1125
الحياوه	147	الطنبي	632	العياني	732
المحياب	210	مشرعه	224	الحصن والخرابه	1092
السلامي	378	الاقرن	592	القبعه	1415
ذي العلبي	306	هيوه	609	الدواني	871
ذي توب	264	شوكه	279	العميق	762
رحق	818	الجوبل	245	منوز	1192
العوادي	500	هرامه	583	القطعه	1735
المقروضه	292	المريمه	268	نجد ساهب	1009
المتوه	348	المرقب	786	مدر	1057
ذي الخصور	396	حنفه	145	المشماس	535
ذيل الاباعر	220	بني العلا	105	الحواير	629
شرق	349	المحرم	179	دار الشرف	568
الهجمه	192	الزياعي	353	المنزل	209
ذي صعبه	306	نوح	182	سماره	514
عفرفر	295	الهتك	312	البهالي	471
بيت القرين	53	العارضه	624	الريد	537
الركه	290	النفازي	266	الهوب	943
التويج	23	السور	261	البياحي	769
وادي هتان	442	عساب	795	المتاسعه	1258
الاكمه	328	السبل	1233	الخضراء	400
صواح	376	صواح	1101	الدخله	798
جبجب سره	203	المناره	438	بيت هيوه	145
الدمنه	446	السهيله	421	الشياحي	382
الفجره	101	عفينه	775	معير	357
جدد	185	الذنبه	850	العقيره	490
	485	الحصحص	209	ذي صير	463
المشراح	112	الصليه	284	ذليابد	385
الصناعي	554	العارضه	303	ظلمه	7480
المنزل	317	نعمان السفلي	556	القشائي	718
الرحب	228	الحشاشي	490	الصوفي	1406
ذي سماعه	109	المخادر	4340	المدوره	1361
المقلد	620	عقد	685	معدن	1505
اللكمه	271	مهيل	447	حضار	1351
البخاري	1142	الرجمه	154	راجم	831
الصلوله	1962	العهاب	669	المقداحه السفلي	356
الحرجه	270	الدرب	280	غلامس السفلي	394
دار الوادي	334	شعب القارط	736	العريفه	1076
الشاته	763	نعب	361	منزل عشي	1032
الفراهي	244	عصران	192	الجاح	263

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
ذي ظلور	1058	جدل الودنين	438	الغافله	159
المضادي	767	المصيذعه	349	جياء	897
السلف	376	السهله	196	كرش	290
ذي دومان	514	خير موضع	504	نوعان	411
المنزل	766	عزان	578	الصدر	574
الجيره	673	عميقه	551	محضاي	375
المهاجمه	927	الحجفه	444	جرايش	296
بركه	451	راس المزله	410	الفراوى	320
الريسه	1076	الاطراف	944	حسام الدين	170
بيت البتول	988	المدن	584	العارضه العليا	367
الحصات	320	عكتب	452	العارضه السفلى	138
الصفاء	738	العذيقي	210	ذى وسطى	564
السهله	960	المرباخه	435	الميدان	670
علاي	268	المعقاب	601	نجد يعسك	252
تليه	554	ذي عرام	283	المنزل	123
المكافسه	478	الجحار	604	عوض	111
عائص	190	الرونه	974	الروسه	510
الجمل	807	الحنائي	1040	ذى راشد	390
المشراح	835	العيدان	779	الحبلة	511
الجلادس	626	الشاحه	585	معاده	354
الصافيه	1435	الصلوه	979	الناحيه	384
هجار	1445	الحطيم	283	الشريف	94
بيت النمنم	357	العلاليه	1491	المحداده	222
الحقيق	899	شعب النجار	1235	الحجيفاء	128
الضبير	511	النسائي	166	عسوقه	125
عكب	937	فضاى	991	الظاهر	596
الشتوره	804	مقارض	191	سواده	102
الفرانع	245	مروحه	1427	بنى مر	194
صائر	853	الحجله	173	شعب عريم	487
المغصوبه	592	المحجر	496	السنابه	181
السهوله	969	الاريمه	344	نعت	124
القبولين	673	المالح	321	الجبوب	106
ساحين	387	الاباذي	234	المقتذعه	114
العرض	268	الزراحي	524	الكداف	171
النجادي	224	الصرفه	144	الازخان	82
السر	832	الجرف	312	المقرائي	250
المعرمه	1079	ذى شوح	1828	الجيره	129
راس حبيش	1192	الجذات	767	النقطة	711
وشير	389	التقادي	1577	الحجفه	197
بين الاكام	501	الجيره	603	الكريه	282
الشعب	1038	الزواحي	1079	المعشار	1456
ذي جبره	1164	نجمان	684	النظارى	513
الضباري	1234	حماحم	1334	العارضه	558
الشوافي	576	العامر	154	المائمه	343
التوماني	855	الحقامي	479	الصناعي	727
المملحة	417	المحجر	600	الربع	831
المشرافه	689	الظهره	835	حبران	631
هجامه	1128	عميقه	614	زاجر	779
مروحه	1107	الظرافه	252	السهله	945
الجراجر	519	بين الدور	210	القطبة	798
عدن مسقل	1543	هدافه	1087	الاثله	478
الشعب وذنبه	1316	قحزه العليا	481	نجد السبيح	785
الحجفه	815	برحات	707	العدن العالى	715
الاصيلاب	420	الزواني	1580	موتان	1701
المحالل	1077	الضبيب	864	مخير عان	859
الصفاء	582	الميناء	1155	الصوافي	2198
السعنه	899	الشرف	746	نيدان	902
ذي عقيل	452	الخرف	703	اوجنات	333
مابن	514	النجر	454	الخنب	182
عائش	374	الخمس	606	نوابه	497
الجبانه	1045	الزبيدي	1977	قهنات	693

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
وادي موعه	1052	بني محمد	792	الجب	1524
النجادي	1301	البراح	1164	الحجف	1374
الرياسي	1428	الاوهار	1139	ضنع	1256
الضرائب	630	المناطيش	270	الروينه	2541
الاجراف	652	الصريم	800	الجله	650
بني عبدالسلام	3622	الوقعه	1497	وادي الحصن	2931
حضنى	796	الكريف	2467	الاشعاب	1307
حديد	606	رجامه	1442	الاوطاف	1806
العارضة	1105	الوادي	1775	قياص	1261
الاحشود	605	المقصابه	1384	الشعيب	855
حجافه	925	العرم	1054	الضاحتين	779
بني شداد	452	البتسمه	238	الهلج	998
العنائن	322	الزانمه	879	بجيل	1131
المسعودية	607	الرش	865	الحوائل	1472
الشرف	270	حويط	777	التوجر	1098
وادي عظمان	570	رحض	1109	الشريه	690
الموسطه	783	الحبيل	726	جهيه	1194
الحلو	745	تفتان	479	القحافيز	1635
السنم	245	الرباده	714	القرين	1163
الحمراء	508	الجاهلي (ومحلاته)	657	الشطيط	1024
المزابر	379	الزراعي	837	المقاديح	692
المقابل	727	الجبل	1347	الراهدة	2523
الجوز	698	المجاهده	1773	المجدورة	827
دفنه	214	المائده	775	شعب حمران	676
الاسور	428	الرسمه	152	الغشيمية	927
حجرات	443	الخياعل	896	الانهوم	2020
نجدالخنس	223	مقوله	416	الفصور	1534
القتيب	445	الشرقي	2678	جبل السقعه	1622
العر	807	الدرداء	1376	الباركه	1159
عران	477	الشعوب	637	المداد	954
صنرواح	574	وادي هنا	680	الشرف	776
الصهوف	673	المحرور	1363	وادي بوكر	2831
وادي اسعد	793	المقيبب	931	الثلث	1621
المراون	1132	المكداسة	1408	الكريبيه	846
الجبل	988	خبات	1654	المزحاقة	1106
العمود	1450	الاحطوب	2440	المنير	665
القصيع	688	الجعم	477	الشعب	720
حليمة	995	الذراع	745	الاشعاب	1398
نجدالدار	601	المصنعه	736	عرعره	1963
الراحه	147	الغوله	851	مصينعه	2482
يخوض	1589	المرجامه	2679	الرمادي	2924
الجعامي	893	السهله	4387	القليعا	1128
شاحط	385	الشهالي	1995	المعبر	1662
وادي عدن	861	اسفل حيران	1683	حصه	862
شعبه	703	الحبيل	850	وادي المكارمه	1839
الجنيد	1137	غرايه	1408	الغول	2408
المقروض	762	المحاددين	2202	العرمه	810
الطحان	516	الغارب	3273	الكدره	1387
عير	840	القحاطن	3366	بني حميد	1281
الجبجب	1225	الهيجه	4159	عراش	1014
الصافيه	920	غبير	107	الذهب	1515
الاعموس	1275	القبقبه	1426	اجحم	1209
كباهيه	717	الباديه	3230	بني ظافر	1743
ذي نشمه	1083	الحنب	1155	الاشعاب	921
الوادي	512	الميثانه	900	الرس العالي	1692
الصليه	1072	البرح	2750	خصالة	1572
بني حرب	821	حسيد	1664	صنيد الغربي	859
الاهمول	1824	مقيطعه	506	الشرقي	1163
الطرف	963	الركب	692	الغضيبه	1352
بني سعيد	758	الزاهر	469	وادي اللاهل	574
العقبه	870	الشجين	434	الربع العالي	2015

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
المدين	9293	المحفري	928	الدلو	880
بيت الشير	1148	الاحمود	1287	العداني	1032
الجنيد	485	الحديره	577	حبير	1056
السبله	577	الشقره	536	شعبة حبير	767
الشراعب	746	النجيد	695	الزعل	317
اهاين	1827	وادي الخراف	909	ساكن الاقروض	945
بردان	526	الزائده	466	القرار	726
عقب	1126	الخصيفا	535	الحقيره	1144
الدفدف	270	القيقاب	1025	حدقات	991
النخله	802	الصرفه	846	الساك	114
صنيد الشرقي	1583	الحويه	631	الكساري	161
شرقي عردن	4997	السلائم	999	الضريه	164
المعير	2917	الجحيف السافل	620	المقواله	497
حور	3075	الحمراء	1673	المشنان	592
الحصابين	2637	الجبل	1672	الفودعيه	1622
رماضه	2686	بني عمر	1102	القبة	834
الزره	996	همدان	817	الرباط رماده	985
الاعدان	401	الجحيفه العالي	249	الحجفة	666
الرضائي	1357	قصيع العمارنه	1028	الوطئه	176
الزهر	1284	العنوه	897	الحجر	157
الوادي	1594	الزنجي	506	المهاره	326
المكاريه	1258	سنعات العمارنه	1479	نخول	349
مقائد	891	المعرضه العليا	370	معاين	777
العنب	1561	المعرضه السفلى	334	التعيب	144
الغربي	1538	قمفه	577	قحمان	446
مروه العليا	1039	محزان	345	وهرةالسفلى	423
مروه السفلى	730	تعوب	1009	الاعدون	262
النجادي	3234	المراكب	2170	حنطم	153
وادي شريط	1919	المشعب	594	المنزل	481
حُمر	3992	حرض	1331	ذي عريم	598
وادي رياد	629	البحرين	311	المشارع	236
الجمجام	754	المعدوف	592	الاركان	190
المتاير	1787	جرين اسفل	334	ذي سماعيل	404
حمر	604	جرين اعلى	499	المقالده	107
التجع	1461	المرقب	543	ذي جبيب	491
الاشيوط	1361	الوعره	408	ذي الحجاج	361
الرجمه والمريره	808	الشرف	965	القاضي	327
الغربي	834	الشرف	1622	ريده ورياد	23
القطعه	903	الموسطه	1438	المدان	541
الشرقي	1957	راس قصع	959	بيت عامر	744
الشريج	857	دار عمير	958	نفس ريد	707
بني واصل	883	فرعان	1577	ذي سواده	869
الصباحي	1016	عرصمه	2167	التومان	902
غابر	727	عنه	1451	ريده	1675
الجبل	1485	الرئاس	2929	بيت الاسد	1031
الوادي	1691	ذي عتام	3329	الجيئات	944
البَرحين	1418	ذي خساع	2249	فجرات	341
الجرار	464	وادي شبز	1707	الخريف	1489
ذي معيد	1170	الجازعه	2376	الحضيره	979
قصيع شلف	1214	دي حصه	1350	الزبور	1720
سنعات شلف	230	خنبه	745	الوصر	2595
براحه العليا	2080	الكراب	2551	صناعه	742
براحةالسفلي	1284	الايوان	2522	حيبان	2903
ما جديد	3576	الكريف	2963	النفس	1677
الجعاري	1729	المجزف	2687	المركبه	2326
الظهار	1842	النصيل	929	الطيني	2272
الحداني	2698	العارضه	1925	الطهم	805
وادي قديف	1304	وادي الكرابي	932	الزغرور	1234
شرف حاتم	1747	المراغه	2293	الموسطة	994
الحنكه	637	الدمن	1121	بيت مهدي	743
القفر	2109	الذنبه	1018	الشرف	717

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الجامع	1338	القاعده-الأمن	584	الدفادف	36
المخلف	468	القاعده-السوق المركزي الجديد	1184	الخنن	101
الوادي	2056	القاعده-السوق المركزي القديم	2244	الشعب	39
دومه	1110	القاعده-النور	374	بيت السلاقه	63
بيت حميد	569	القاعده-خالد بن الوليد	420	بيت العدنه	36
الحجفار	864	القاعده-المركزي	1837	بيت الراعي	30
بيت عيس	576	القاعده-الصيارف	3356	باب الدار	47
بيت عقيل	604	القاعده-حارة المشروع	998	بيت القفري	65
الرحوب	2125	القاعده-26سبتمبر	170	بيت المنظر	94
المؤجله	1909	القاعده-سباء	3471	بيت العودي	109
الفاش	3550	القاعده-حارة القاضي	239	المدقه	86
الوادي	2499	القاعده-شارع تعز	898	بيت الرمانه	22
المنيل	1257	القاعده-قرية المنصورة	915	قلامه	253
اللفجين	1629	القاعده-الجامع	420	فتاحي	35
داغش	584	القاعده-وادي عبد الوهاب	431	الجرار	10
الحجر	1444	القاعده-ضبابح	3057	بيت الرواحب	37
بني عامر	2032	القاعده-الحرير	5920	القين	569
الرباط	1386	القاعده-جبل الحرير الأعلى	1624	العذري	1313
العقيره	413	القاعده-الحرير الأعلى	1821	الجبال	2532
شوائط	2039	القاعده-الثورة	68	التحيم	1858
حمره	408	القاعده-الترتور	1421	العزله	1997
العرمة	522	القاعده-الجرادي	292	حمر اعلى	2252
شبعان	285	السفنه	4241	العدوف	1190
ذي الحيكل	792	عيلال	1772	لحمان	921
ردانع	557	وهيرات	1971	حمر اسفل	679
عرج	886	المحجر	3073	ذي حافظ وجثمان	2062
الجامع	2216	الرباط	1869	الضاهيه	876
ذي فرع	829	منزل خنوه	1453	حزة	1544
الصال	707	ذي السفال	8435	سوق النجد	2553
شفح	1373	حقير	448	السودان	1568
طائف	676	المقلد	1272	المراونة	2019
مزوم	592	الرباط	1311	المفروض	1304
ارياب	232	العدانه	488	الحدود	1686
العارضه	772	مديه	1259	عدان	1137
عرامه	375	المشرعه	706	المحداده	1800
العسكر	616	المدبغه	2317	الساعة	1362
بحرانه	461	المحاريق	379	حصبان	2084
الظهر	654	المريفه	451	الريس	1553
العقيره	307	العومري	110	المنزل	737
المقام	426	التحيبه	356	السنح	1087
المجادره	569	المشيرحي	346	التماري	536
المراكب	491	الشعوب	276	الصفيعة	1047
المطاحن	456	الكريه	346	حيز	1219
العكر	378	دار الجامع	584	الشرف	668
العرض	342	الجرف	1223	عتب	936
الجامع	535	الهياجم	209	الضبير	932
لبا	307	الكراب	687	راوات	742
القاعده-أكمة السدم	493	منزل الورد	1520	دهران	597
القاعده-نجد الله اكبر	1401	دمنة الجشاعة	566	الشخص	2499
القاعده-شعب الجعدي	554	الجشاعة	825	راوات	3783
القاعده-وادي القاعدة	2601	منزل الصناع	89	الحمادي	3262
القاعده-جامع الجرادي	597	قريش	1087	براح	1512
القاعده-المداجر	851	الخرابه	1321	العقرمي	3848
القاعده-نوبة الغزال	286	حجفات	970	الشرقي	3378
القاعده-القاعدة العليا	1501	الحوري	2882	ذي عويد	2011
القاعده-العرض	756	حذاذه	900	الغربي	1855
القاعده-ترتور اسفل	3107	مذيخره (قلامة)	1521	بني الورد	1880
القاعده-ترتور اعلى	1826	السهله	882	المسلقه	2560
القاعده-المرباع	1922	احوال البر	2994	الدهادة	3412
القاعده-السوق القديم	245	ذي عرمه	10	كثران	1261
القاعده-الصليوة	61	بيت القيب	29	الاصروم	594

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الهين	4668				
بني البيضاء	2387				
بني عمر	1923				
الزامليه	1676				
المزهر	2682				

Annex 10: Job Descriptions for Survey Teams (Extracted from SMART Training Materials

Each survey team should be composed of at least 3 people. Including women in survey teams is highly recommended since they are usually more comfortable interacting with children. Generally, two surveyors are involved in anthropometric measurements while another one, the team leader, records the data on the forms. However, it is strongly suggested that each team member knows how to accomplish the tasks of his teammates, because unexpected events can happen and a change in the staff may be required.

All team members must have the following qualifications:

- They should be able to write and read English or French (depending on the country where the survey takes place) and speak the local languages of the areas where the survey will be conducted.
- They should have sufficient level of education, as they will need to read and write fluently and count accurately.
- They should be physically fit to walk long distances and carry the measuring equipment.
- They do not (necessarily) have to be health professionals. In fact, anyone from the community can be selected and trained as long as he meets the above criteria.

1. Survey Manager (or supervisor)
The manager guarantees the respect of the survey methodology; he has the responsibility for:

1- Gathering available information on the context and survey planning,

2- Selecting team members,

3- Training team members,

4- Supervision of the survey: Taking necessary actions to enhance the accuracy of data collected:

4.1 Visiting teams in the field and making sure that before leaving the field, each team leader reviews and signs all forms to ensure that no pieces of data have been left out; making sure that the team returns to visit the absent people in the household at least once before leaving the area.

4.2 It is particularly important to check cases of oedema, as there are often no cases of oedema seen during the training and some team members may therefore be prone to mistaking a fat child for one with oedema (particularly with younger children). The supervisor should note teams that report a lot of oedema, confirm measles and death cases, and visit some of these children to verify their status.

4.3 Ensuring that households are selected properly and, that the equipment is checked and calibrated each morning during the survey, and that measurements are taken and recorded accurately.

4.4 Deciding on how to overcome the problems encountered during the survey. Each problem encountered and decision made must be promptly recorded and included in the final report, if this has caused a change in the planned methodology.

4.5 Organizing data entry into ENA and checking any suspect data every evening, by using the appropriate sections of the plausibility report.

4.6 Organizing an evening "wrap up" session with all the teams together to discuss any problems that have arisen during the day[25].

4.7 Ensuring that the teams have enough time to take appropriate rest periods and has refreshments with them. It is very important not to overwork survey teams since there is a lot of walking involved in carrying out a survey, and when people are tired, they may make mistakes or fail to include more distant houses selected for the survey.

5- Analyse and write the report.

2. Team Leader

Skills and required abilities:

To be able to read, write and count; know the area to survey; be reliable and friendly.

Tasks:

1. Ensures all forms and questionnaires are ready at start of day;
2. Ensures all equipment is ready at start of day;
3. Calibrates measurement instruments on daily basis;
4. Ensures all food/refreshments are ready at start of day;
5. Organises briefing meeting with his team before departure in morning;
6. Speaks with chief of village to explain the survey and its objectives,
7. Draws a map of the area to survey and use a random table;
8. Manages the households selection procedure;
9. Uses a local events calendar to estimate the age;
10. Calculates the Weight-for-Height ratio after taking anthropometric measurements;
11. Checks if the child is malnourished (checks for the presence of oedema);
12. Fills the anthropometric form;
13. Fills survey questionnaires when needed;
14. Fills the referral form if necessary;
15. Ensures that houses with missing data are revisited before leaving the field the same day;

[25] This may not be possible if the survey area is large since the teams might be widely separated and remain in the field for several days. In that case, communication with teams in the field might often be very difficult; hence, each team leader must be sufficiently trained to be able to take decisions independently.

16. Checks that all forms are properly filled out before leaving the field.
17. Ensures that all the equipment is maintained in a good state;
18. Manages time allocated to measurements, breaks and lunch,
19. Ensures security of team members,
20. Note and report the problems encountered.

3. Measurers

Skills and required abilities:

To be able to read, write and count; know the area to survey; be reliable and friendly.

Tasks:

1. Measures the height, weight and arm circumference (if included in the survey);
2. Assesses the presence of edema;
3. Uses a local events calendar to estimate the age;
4. Respects the time required for measurements, breaks and meals;
5. Takes care of the equipment;
6. Follows security measures.

The measurers must acquire some special skills and knowledge although they don't have the primary responsibility for tasks that are related:

1. Know how to calculate the weight-for-height ratio;
2. Know how to select households for the survey;
3. Know how to check if a child is malnourished;
4. Learn how to make a reference for a malnourished child.

Annex 11: Referral Form for the Malnourished Children

مسح الحالة التغذوية للأطفال تحت سن الخامسة في محافظة إب، نوفمبر - ديسمبر 2012

استمارة إحالة طفل مصاب بسوء تغذية حاد وخيم

الأخوة/ المرفق الصحي : .....

نود إحاطتكم أن الطفل/ الطفلة : ..... كان/ كانت
ضمن عينة المسح المشار إليه أعلاه ووجد أنه مصاب بسوء تغذية حاد من خلال القياسات التالية:

محيط ذراع الطفل بالسنتيمتر (ØØ. Ø)	سنتيمتر	

طول / ارتفاع الطفل بالسنتيمتر (ØØØ. Ø)	سنتيمتر	

وزن الطفل بالكيلوجرام (ØØ. Ø)	كيلوجرام	

وجود التوذم: (نعم / لا)

تاريخ القياس	يوم	شهر	سنـــــة
			2 Ø 1 2

يرجى تعاونكم معه/ معها

وتقبلوا تحيات فريق المسح

اسم المشرف الميداني .....

توقيعه

Annex 12: Assessments Quality Checks

1. Ibb Eastern Highlands Ecological Zone: Overall Data Quality

Plausibility check for: Eastern Highlands.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (0.8 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.254)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**4** (p=0.038)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**2** (7)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (0.94)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.26)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.41)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	
			0	1	3	5	**0** (p=0.339)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	**6** %

At the moment the overall score of this survey is 6 %, this is good.

Ibb Western Highlands Ecological Zone: Overall Data Quality

Plausibility check for: Western Highlands.as

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (0.7 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**2** (p=0.084)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**10** (p=0.000)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**2** (6)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (0.92)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.19)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.12)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	
			0	1	3	5	**0** (p=0.052)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	**14** %

At the moment the overall score of this survey is 14 %, this is acceptable.

Annex 13: Tables of Weighted Finding of Nutritional Status

The weighted prevalence of GAM and SAM is 8.1 per cent and 0.9 per cent in rural and 7.4 per cent and 2.4 per cent in urban areas, while levels are higher among boys (9.6 per cent and 1.6 per cent) than girls (6.3 per cent and 0.5 per cent). The overall GAM and SAM prevalence is 8.0 per cent and 1.1 per cent respectively. No Oedema case was reported in the each of the two zones.

The weighted prevalence of stunting in Ibb Governorate is 56.8 per cent with severe stunting of 25.0 per cent. Thus, the severity for Ibb is classified as 'critical' as per WHO categorization. The prevalence of stunting in rural is 60.6 per cent with severe stunting of 27.4 per cent and in urban is 32.5 per cent with severe stunting of 9.4 per cent, and high as 59.2 per cent among children in the third year of age. Levels of stunting and severe stunting in boys are 58.4 per cent and 25.3 per cent and in girls are 55.0 per cent and 24.6 per cent respectively.

The weighted prevalence of underweight in Ibb Governorate is 36.9 per cent with severe underweight of 9.9 per cent. The prevalence of underweight in rural is 39.0 per cent with severe underweight of 10.9 per cent and in urban is 23.6 per cent with severe underweight of 3.3 per cent. Levels of underweight and severe underweight among boys are 37.9 per cent and 9.0 per cent and among girls are 35.8 per cent and 9.9 per cent respectively.

Weighted rates are mentioned in the tables 1-3 below with 95 per cent confidence intervals. Figures mentioned above and in tables below have been calculated after exclusion of SMART flags.

1: Stunting among children distributed per zone, residency place, gender, and age category

Stunting		N	%	95% Conf Limits	
				Lower	Upper
Rural (n = 1648.72)	moderate	547.42	33.2%	30.9%	35.5%
	severe	452.04	27.4%	25.3%	29.7%
	Moderate and severe	999.46	60.6%	58.2%	63.0%
Urban (n = 258.66)	moderate	59.7	23.1%	18.2%	28.8%
	severe	24.26	9.4%	6.0%	13.5%
	Moderate and severe	83.96	32.5%	26.8%	38.5%
Girls (n = 915.64)	moderate	278.62	30.4%	27.5%	33.5%
	severe	225.18	24.6%	21.9%	27.5%
	Moderate and severe	503.8	55.0%	51.7%	58.3%
Boys (n = 991.74)	moderate	328.5	33.1%	30.2%	36.2%
	severe	251.12	25.3%	22.7%	28.2%
	Moderate and severe	579.62	58.4%	55.3%	61.5%

6 - below 12 months (n = 212.86)	moderate	55.02	25.8%	20.1%	32.3%
	severe	35.18	16.5%	11.7%	22.1%
	Moderate and severe	90.2	42.4%	35.6%	49.3%
12 - below 24 months (n = 454.92)	moderate	144.06	31.7%	27.5%	36.2%
	severe	123.9	27.2%	23.2%	31.6%
	Moderate and severe	267.96	58.9%	54.2%	63.4%
24 - below 36 months (n = 452.4)	moderate	143.02	31.6%	27.4%	36.2%
	severe	117.84	26.0%	22.1%	30.4%
	Moderate and severe	260.86	57.7%	53.0%	62.2%
36 - below 48 months (n = 413.44)	moderate	128.5	31.1%	26.7%	35.8%
	severe	116.36	28.1%	23.9%	32.8%
	Moderate and severe	244.86	59.2%	54.3%	64.0%
48 - below 60 months (n = 373.76)	moderate	136.52	36.5%	31.7%	41.7%
	severe	83.02	22.2%	18.2%	26.8%
	Moderate and severe	219.54	58.7%	53.5%	63.7%
Eastern Highlands (n = 1121)	moderate	350.46	31.3%	28.6%	34.1%
	severe	273.76	24.4%	22.0%	27.1%
	Moderate and severe	624.22	55.7%	52.7%	58.6%
Western Highlands (n = 786.38)	moderate	256.66	32.6%	29.4%	36.1%
	severe	202.54	25.8%	22.8%	29.0%
	Moderate and severe	459.2	58.4%	54.9%	61.9%
Ibb (n = 1907.38)	***moderate***	***607.12***	***31.8%***	***29.8%***	***34.0%***
	severe	***476.3***	***25.0%***	***23.1%***	***27.0%***
	Moderate and severe	***1083.42***	***56.8%***	***54.5%***	***59.0%***

2: **Underweight among children distributed per zone, residency place, gender, and age category**

Underweight		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Rural (n = 1705.48)	moderate	478.9	28.1%	26.0%	30.3%
	severe	185.84	10.9%	9.5%	12.5%
	Moderate and severe	664.74	39.0%	36.7%	41.3%
Urban (n = 263.02)	moderate	53.34	20.3%	15.5%	25.5%
	severe	8.72	3.3%	1.6%	6.4%
	Moderate and severe	62.06	23.6%	18.6%	29.2%
Girls (n = 942.1)	moderate	244.66	26.0%	23.2%	28.9%
	severe	92.82	9.9%	8.1%	12.0%
	Moderate and severe	337.48	35.8%	32.8%	39.0%

Boys (n = 1026.4)	moderate	287.58	28.0%	25.3%	30.9%
	severe	101.74	9.9%	8.2%	11.9%
	Moderate and severe	389.32	37.9%	35.0%	41.0%
6 - below 12 months (n = 216.5)	moderate	49.64	22.9%	17.6%	29.2%
	severe	22	10.2%	6.5%	15.0%
	Moderate and severe	71.64	33.1%	27.0%	39.9%
12 - below 24 months (n = 475.48)	moderate	118.26	24.9%	21.1%	29.1%
	severe	40.36	8.5%	6.2%	11.5%
	Moderate and severe	158.62	33.4%	29.2%	37.8%
24 - below 36 months (n = 469.58)	moderate	123.48	26.3%	22.4%	30.6%
	severe	46.56	9.9%	7.4%	13.1%
	Moderate and severe	170.04	36.2%	31.9%	40.8%
36 - below 48 months (n = 424.72)	moderate	119.84	28.2%	24.0%	32.8%
	severe	46.46	10.9%	8.2%	14.4%
	Moderate and severe	166.3	39.2%	34.5%	44.0%
48 - below 60 months (n = 383.22)	moderate	121.02	31.7%	27.1%	36.6%
	severe	39.18	10.3%	7.5%	13.8%
	Moderate and severe	160.2	41.9%	36.9%	47.0%
Eastern Highlands (n = 1149.32)	moderate	298.54	26.0%	23.5%	28.6%
	severe	110.92	9.7%	8.0%	11.5%
	Moderate and severe	409.46	35.6%	32.9%	38.5%
Western Highlands (n = 819.18)	moderate	233.7	28.5%	25.5%	31.8%
	severe	83.64	10.2%	8.3%	12.5%
	Moderate and severe	317.34	38.7%	35.4%	42.2%
Ibb (n = 1968.5)	***moderate***	***532.24***	***27.0%***	***25.1%***	***29.1%***
	severe	***194.56***	***9.9%***	***8.6%***	***11.3%***
	Moderate and severe	***726.8***	***36.9%***	***34.8%***	***39.1%***

3: Wasting among children distributed per zone, residency place, gender, and age category

Wasting		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Rural (n = 1703.12)	moderate	123.22	7.2%	6.1%	8.6%
	severe	15.18	0.9%	0.5%	1.5%
	Moderate and severe	138.4	8.1%	6.9%	9.6%
Urban (n = 263.38)	moderate	13.08	5.0%	2.7%	8.3%
	severe	6.36	2.4%	0.8%	4.9%
	Moderate and severe	19.44	7.4%	4.4%	11.1%

Wasting		N	%	95% Conf Limits	
				Lower	Upper
Girls (n = 938.1)	moderate	53.84	5.7%	4.4%	7.5%
	severe	4.82	0.5%	0.2%	1.3%
	Moderate and severe	58.66	6.3%	4.8%	8.0%
Boys (n = 1028.4)	moderate	82.46	8.0%	6.5%	9.9%
	severe	16.72	1.6%	1.0%	2.7%
	Moderate and severe	99.18	9.6%	7.9%	11.7%
6 - below 12 months (n = 218.5)	moderate	25.28	11.6%	7.6%	16.4%
	severe	2	0.9%	0.1%	3.3%
	Moderate and severe	27.28	12.5%	8.3%	17.5%
12 - below 24 months (n = 473.12)	moderate	33.64	7.1%	5.0%	9.9%
	severe	6	1.3%	0.5%	2.9%
	Moderate and severe	39.64	8.4%	6.1%	11.3%
24 - below 36 months (n = 469.58)	moderate	27.74	5.9%	4.0%	8.5%
	severe	4.82	1.0%	0.4%	2.6%
	Moderate and severe	32.56	6.9%	4.9%	9.7%
36 - below 48 months (n = 425.08)	moderate	18.92	4.5%	2.8%	7.0%
	severe	6.72	1.6%	0.7%	3.4%
	Moderate and severe	25.64	6.0%	4.0%	8.8%
48 - below 60 months (n = 380.22)	moderate	30.72	8.1%	5.6%	11.4%
	severe	2	0.5%	0.1%	2.1%
	Moderate and severe	32.72	8.6%	6.1%	12.0%
Eastern Highlands (n = 1148.14)	moderate	73.16	6.4%	5.1%	8.0%
	severe	14.16	1.2%	0.7%	2.1%
	Moderate and severe	87.32	7.6%	6.2%	9.3%
Western Highlands (n = 818.36)	moderate	63.14	7.7%	6.0%	9.8%
	severe	7.38	0.9%	0.4%	1.9%
	Moderate and severe	70.52	8.6%	6.8%	10.8%
Ibb(n = 1966.5)	***moderate***	***136.3***	***6.9%***	***5.9%***	***8.2%***
	severe	***21.54***	***1.1%***	***0.7%***	***1.7%***
	Moderate and severe	***157.84***	***8.0%***	***6.9%***	***9.3%***