Health, Livelihoods, and Food Intake
in Coastal Southeast Tanzania:

From Questionnaires Interviews in Kijiweni Village, Lindi Region

SAKAMOTO Kumiko, Parinya KHEMMARATH*, OHMORI Reiko**, and Anna C. MARO***

Introduction

1. Health and nutrition status in Tanzania

Zero hunger, good health, and well-being are important goals for the Sustainable Development Goals (SDGs), yet many people have not been able to fulfill these goals. In Tanzania, on the east coast of Africa, great improvement has been seen in Under-5 Mortality Rates (U5MR) and Infant Mortality Rate (IMR) at 66.5 and 46.2 per 1,000 births respectively, almost reaching the Millennium Development Goal (MDG) of 64 and 38 per 1,000 births[1]. However, MDG to reduce hunger shows a mixed picture. The prevalence of underweight for children under-5 is 13.4% which is close to reaching the target of 12.5%, as well as the Global Acute Malnutrition (GAM) or wasting measured by weight-for-height at 3.8%. However, chronic malnutrition or stunting measured by height-for-age remains at 34.7%.[2]

Regional disparities are also prevalent in Tanzania. In the *2010 Tanzania Demographic Health Survey* (TDHS, Map 1), Lindi (54%), Dodoma (56%), and Iringa (52%) Regions have the highest percentage of stunting over 50%[3]. TFNC (Tanzania Food and Nutrition Centre) survey 2014 earmarks Kagera (51.9%), Njombe (51.5%), and Iringa (51.3%), as regions of stunting over 50%. The Lindi Region was at 36.2%, slightly higher than the mainland average of 35.0%.[4]

As for rate of acute malnutrition (GAM, wasting), Zanzibar (7.2%), Dodoma (5.2%), Tanga (4.8%), Mara (4.9%), and Singida (4.7%) have the highest, and Iringa has the lowest at 0.7%. The Lindi Region is at 2.9%, lower than the national average[5].

For underweight, Kagera (22.2%) and Dodoma (21.8%) Regions have the highest, followed by Kigoma (18.8%), Pemba South (18.1%), Pemba North (16.7%), and Iringa (15.5%). Dar es Salaam has the lowest percentage of underweight (6.6%). The Lindi Region is at 11.0%, lower than the average[6].

As for U5MR, Kagera (93.9 per 1,000), Iringa (90.7), Katavi (88.0), Zanzibar Kusini Unguja (85.9), and Njombe (81.4) Regions have the highest rates and have not reached the MDG as of the 2012 Census. Similar tendency is seen with the IMR. Lowest U5MR and IMR are in Arusha (37.3 and 29.0 respectively) and Kilimanjaro (38.5 and 29.6 respectively) Regions. U5MR of the Lindi Region is at 65.0 and IMR is at 47.0, slightly lower than the national average but above the MDG[7]. This has been based on great improvement from the previous 2001 Census with U5MR at 217[8]. However, the U5MR of Lindi District is 71.7, and IMR is 50.7, which is higher than the national average and

Map 1. Stunting of children by Region (2010)
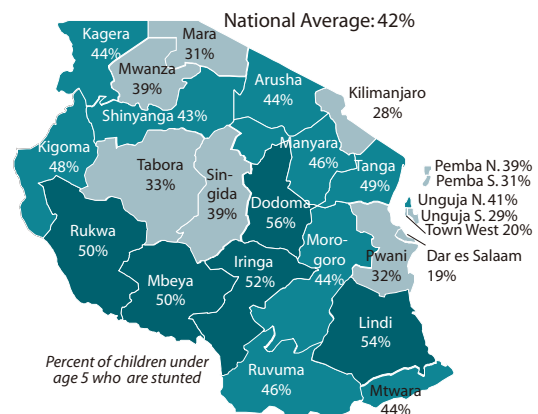
Source: Tanzania 2011, p.10.

*Utsunomiya University, Graduate Student
**Utsunomiya University, School of Regional Design, Professor
***Lindi Region, Community Development Officer

MDG[9].

Tanzania has improved underweight and children's mortality at the national level, but has high level of chronic malnutrition. Furthermore, there are steep disparities among regions.

2. Research area

While Tanzania has almost achieved its MDG for U5MR, underweight, and malnutrition, the Lindi Region also has shown great improvement in these indicators. However, chronic malnutrition, which Tanzania has not been able to meet the goals, also remains high in the Lindi Region, above the national average.

As one of the deprived regions for child survival, Mchinga II village, located on the coast in the Lindi Region has been researched, and factors influencing child survival have been assessed in previous research. One of the contributing factors of child survival was the use of sorghum for children's food[10]. In this respect, this research has been designed to focus on the contribution of indigenous food and wild food for improved nutrition and health. In discussion with authorities of the Lindi Region and Lindi District, Kijiweni Village, along with Malolo Village in Ruangwa District have been identified as villages that have experienced food shortage, yet have been utilizing indigenous wild food obtainable within the area.

Kijiweni Village is a village in Lindi District, Lindi Region located on the coast. It is about 72 km away from Lindi town on the coast, turning off Mchinga villages from the road that connects Lindi with Dar es Salaam (Map 2).

The village is surrounded by a variety of vegetation. In the ocean and on the coast, there are mangroves, which are under protection. On the coast, there are sandy patches with vegetation that allow various edible wild foods. In the vicinity, there is the Dimba forest reserve with endemic species.

The village has a long history. It has been one of the focal points for exporting gold and ivory from the interior to Zanzibar and the Arabs World. There

is also a historical rock indicating the relationship between Mozambique and Tanzania from the German colonial period. Furthermore, the village has existed before the *ujamaa* villagization of 1965. However, housing area has been eroded with ocean water, and most of the houses have been moved in 1982 to the present site with higher sea level. It has also experienced hunger (*njaa*) in 2014, and has been

Table 1. Household, population, and sample of each hamlet in Kijiweni Village

Name of Hamlet	Households	Population			Sample	
		Women	Men	Total	n	%
Stendi	82	214	124	338	12	14
Mwera	88	201	172	373	12	14
Matimba A	97	224	107	331	12	14
Matimba B	60	157	87	244	12	14
Mjini (Majomani)	47	106	75	181	12	14
Machopwa	64	114	99	213	12	14
Kilimani	44	94	72	166	12	14
Total	482	1,110	736	1,846	84	100

Source: Created based on the Village Government data and questionnaire.

distributed maize in 2015[11].

There are 482 households, consisting of 1,110 women and 736 men in Kijiweni Village (Table 1). They consider their ethnic group as Mwera or Makonde, or as Machinga which is a mix between Mwera and Makonde as in Mchinga II Village. One of the characteristics of being Machinga is that some do not necessarily speak the ethnic language such as the Mwera language.

3. Methodology

The questionnaire interview was based on a comprehensive questionnaire in Swahili. It included 75 questions about the respondents, marriage and family, livelihood, groups, mutual assistance, children, health, and food intake. Questions on health are based on the standardized SF-12, and the Swahili translation has been based on the verified Swahili SF-36[12]. Questions on food intake frequency have been formulated based on research in Japan[13], adjusted to food in Tanzania based on *Tanzania Food Composition Tables*[14] and discussions with nutrition specialists in Tanzania. Questions on groups and mutual assistance have been formulated with reference to *Measuring Social Capital*[15]. Other questions have been formulated based

Map 2. Kijiweni Village in Lindi Region,Tanzania

Source: Created by Tsuda Katsunori from google Earth.

Map 3. Hamlets in Kijiweni Village

Source: Created by Tsuda Katsunori from Google Earth.

on the author's previous questionnaire interviews[16]. The questionnaire has been pre-tested in Lindi, Dodoma[17], and Dar es salaam, and adjusted.

The questionnaire has been interviewed by two of the authors and seven research assistants selected in the village based on their writing capabilities during 25-27 Sept. 2019. All research assistants from the village were male, which is typical in a coastal village of the Lindi Region, but both of two authors involved in the interviews were female.

The interviewees were selected from all hamlets of the village to cover the whole village (Table 1, Map 3). Twelve households were selected per hamlet, with a total of 84 respondents. Interviewees were selected from each household, but not limited to household heads to enable women to also respond to the questionnaire.

Research ethics were followed in accordance with the rules and regulations of the Utsunomiya University (permission granted as H18-0008), such as prior explanation and consent for interview. In this paper, result of a preliminary compilation of the answers to the questions will be reported. Percentage is calculated from the total responding to each question, and not the total respondents. The results are analyzed in reference to previous similar researches in Iringa and Dodoma Regions.

I. Results

The Original Swahili questionnaire, English translation, and the major results are indicated in Table 2. Results of questions indicated with "+" are indicated elsewhere, either in the text or other tables. Percentage is calculated based on the total valid answers for each question unless otherwise stated. All the tables and diagrams are created by the authors based on the questionnaire unless otherwise stated.

1. About the respondents

More women were interviewed (53, 63%) in comparison to men (30, 36%). The ages of the respondents range from 19 to 74, but 25 (30%) are in their 30s (Table 3). Most of their religions are Islam (99%). The ethnic group of the majority are the Mwera (62%), followed by Makonde (18%), Makua (4%), Yao (4%), and Matumbi (2%). There were two respondents that considered themselves Machinga, or a mix of Mwera and Makonde. There was one respondent each of Hehe and Sambaa (Table 4).

Majority (80%) participated in their initiation and 73% studied in school. All of those 73% went to elementary school, 69% finishing their education only at the elementary level and 4% progressing to secondary. Four percent went to madras, and 1% went to university (Table 2).

2. About marriage and family

Almost all of the respondents (99%) have the experience of being married. Majority (82%) decided their marriage on their own, but 18% had their marriage decided by their parents. All of their families received bridewealth in the form of money, and only 9% received in the form of livestock such as chicken or goat.

The average amount of bridewealth in money was TSh114,541, ranging from TSh32 to TSh1,000,000. Seven respondents (9%) received bridewealth in the form of livestock which is mainly chicken. The common numbers of livestock as bridewealth are 10 chicken (2 respondents, 2%) and six chicken (2, 2%) (Table 5).

Table 2. Questionnaire interview (Swahili and English) and its major results

Swahili original	English translation	Entry code	+	0 (No/Hapana)	%	1 (Yes/Ndiyo)	%	2	%	3	%	4	%	5	%	Total n	Average
Swahili	[Translation omitted when No/Yes question]																
Taarifa binafsi	**About yourself**																
Jinsia: □ 1 Ke □ 2 Me	Sex: 1 Female 2 Male	Jinsia		1	1%	53	63%	30	36%							84	1.35
2. Mwaka wa kuzaliwa? 19___	Year born?	2														79	1,977.97
a) umri: ___	Age	a	3+													79	41.04
□ b) sijui	Don't know	b				3										3	
3. Dini yako? □ 1 Muislam □ 2 Mkristo	Your religion? 1 Islam 2 Christian 3 Other+	3				82	99%	1	1%	0	0%					83	1.01
4. Kabila:	Ethnic group	4	4+													79	
(5) Umechezwa unyago au jando? □ 0 Hapana □ 1 Ndiyo	Have you had your initiation?	5		17	20%	67	80%									84	0.80
6. Ulisoma shule? □ 0 Hapana □ 1 Ndiyo	Did you study in school?	6		23	27%	61	73%									84	0.73
□ 1 msingi	Elementary only	6.1		26	31%	58	69%									84	0.69
	Elementary (all)			23	27%	61	73%									84	0.73
□ 2 sekondari	Secondary	6.2		81	96%	3	4%									84	0.04
□ 3 madrasa	Madras	6.3		81	96%	3	4%									84	0.04
□ 4 nyingine	Other	6.4		83	99%	1	1%									84	0.01
Kuhusu ndoa na familia	**About marriage and family**																
7. Umewahi kuoa/ kuolewa? □ 0 Hapana →Q11 □ 1 Ndiyo →Q8	Have you ever been married?	7		8	10%	76	90%									84	0.90
(8) Je nani alitoa maamuzi ya wewe kuoa/ kuolewa?: □ 1 Wazazi □ 2 Mwenyewe	Who decided about your marriage?: 1 Parents 2 Yourself"	8				14	18%	63	82%							77	1.82
(9) Je familia yako (au wewe mwenyewe) ilipokea au kulipa mahari? □ 0 Hapana →Q11 □ 1 Ndiyo	Have your family or yourself receive or paid bridewealth?	9				76	100%									76	1.00
(10) Je walipata/ kulipa nini kwa ajili ya mahari yako? □ 1 Pesa:	What did they receive/pay as bridewealth? Money	10.1				77	100%									77	1.00
10.1(2) TSh:	TSh	10.1(2)	(+)													77	114,540.68
10.2 Mifugo:	Livestock	10.2		70	91%	7	9%									77	0.09
gani mingapi?	How many of what kind?	10.2(2)	5+													77	
11. Sasa ndoa yako ni ipi? □ 1 Hamna ndoa (unmarried) →Q11b □ 2 Umeo(le)wa (married) →Q11b □ 3 Mmeachwa (Mtaliki, divorced) □ 4 Unakaa mahali tofauti (separated) □ 5 Mjane/ Mgane (widowed)	How is your marriage now? 1 Unmarried 2 Married 3 Divorced 4 Separated 5 Widowed	11				8	10%	58	73%	8	10%	0	0%	5	6%	79	
(11b) Je ndoa yako ni ya mke mmoja au zaidi matala (polygamy): Wangapi?	Is your marriage of one wife or more (polygamy): How many?	11b				45	73%	13	21%	3	5%	1	2%			62	1.35
12. Je unaishi pamoja na mume/mke au mwenza wako? □ 0 Hapana □ 1 Ndiyo	Do you live with your husband/wife or partner?	12		16	21%	62	79%									78	0.79
13. Je unaishi na watu wangapi nyumbani? a) Jumla wangapi: ___	How many people live in your house? Total:	13a	5+			5	6%	9	11%	15	18%	25	30%	13	16%	82	4.05
b) Watoto chini ya miaka 5 ni wangapi: ___ 0 →Q14	How many children under-5?	13b	5+	33	45%	35	47%	5	7%	1	1%					74	0.65
(13c) Hali ya lishe (uzito) ya mtoto chini ya mwaka 5: □ 0 Sijui □ 1 Inatosha/Kijani (Green) □ 2 Haitoshi kiasi/Kimanjano (Yellow or Grey) □ 3 Haitoshi kabisa/Nyekundu (Red)"	Nutrition status of children under 5: 0 Don't know 1 Good (Green) 2 Average (Grey) 3 Bad (Red)"	13c		7	16%	31	69%	7	16%	0	0%					45	1.00
14a. Je una watoto waliofariki chini ya miaka 5? □ 0 Hapana →Q15 □ 1 Ndiyo:	Do you have children who died under-5?	14a		52	75%	17	25%									69	0.25
Wangapi? ___ →Q14b	How many?	14a1	6+	52	76%	12	18%	2	3%					2	3%	68	0.38
(14b) Sababu gani? □ 0 Sijui □ 1 Mgonjwa: malaria □ 2 Magonjwa mengine: □ 3 Ajali □ 4 Nyingine	What was the reason? 0 Don't know 1 Sickness: malaria 2 Other sickness 3 Accident 4 Other	14b	+	11	65%	1	6%	1	6%	1	6%	3	18%			17	1.06
Kuhusu maisha	**About livelihood**																
15. Kazi yako? □ 1 Mkulima	Your occupation? Farmer	15.1		5	6%	79	94%									84	0.94
15.2 Biashara	Business	15.2		81	96%	3	4%									84	0.04

Swahili original	English translation	Entry code	+	0 (No / Hapana)	%	1 (Yes / Ndiyo)	%	2	%	3	%	4	%	5	%	Total n	Average
□3 Ufugaji	Livestock keeping	15.3		82	98%	2	2%									84	0.02
□4 Nyingine	Other	15.4	+	82	98%	2	2%									84	0.02
16. Una mifugo? □ 0 Hapana □ 1 Ndiyo:	Do you have livestock?	16		34	44%	44	56%									78	0.56
Ngapi? Ngombe: ___	How many? Cows?	16Ngombe	5+			2	50%					2	50%			4	2.50
mbuzi: ___	Goat	16Mbuzi	5+			2	18%	1	9%	2	18%	1	9%	1	9%	11	5.55
kuku: ___	Chicken	16Kuku	5+			3	10%	2	6%	2	6%	1	3%	3	10%	31	7.90
nyingine: ___	Other	16nyingine	+														
17a. Una shamba? □ 0 Hapana □ 1 Ndiyo	Do you have a farm?	17a		3	4%	80	96%									83	0.96
b. Una bustani? □ 0 Hapana □ 1 Ndiyo	Do you have a garden?	17b		72	96%	3	4%									75	0.04
18. a Mazao makuu ya shambani kwako ni yapi? □ 1 Mahindi	What is your major crop? 1 Maize	18a1		61	73%	22	27%									83	0.27
□2 Mpunga	2 Rice	18a2		83	100%	0	0%									83	0.00
□3 Mtama	3 Sorghum	18a3		54	65%	29	35%									83	0.35
□4 Muhogo	4 Cassava	18a4		44	53%	39	47%									83	0.47
□5	5 Other	18a5		48	58%	35	42%									83	0.42
Other	Other	18aOther	+														
b Je ni nini sababu ya kulima mazao hayo? □ 1 Chakula	What is the reason for you to cultivate the above crop? 1 Food	18b1		8	10%	75	90%									83	0.90
□2 Biashara	2 Business	18b2		55	66%	28	34%									83	0.34
□3 Mazingira inafaa	3 Environments suits the crop	18b3		83	100%	0	0%									83	0.00
□4	4 Other	18b4	+	81	98%	2	2%									83	0.02
19. Nani anaamua kuhusu matumizi ya mazao? □ 1 Mwanamke tu □ 2 Mwanaume tu □ 3 Mwanamke na mwanaume	Who decides about the use of the crop? 1 Women only 2 Men only 3 Women and men	19				9	12%	9	12%	60	77%					78	
20. Kwa siku hizi chakula kinatosha kwa mwaka mzima nyumbani? □ 0 Hapana □ 1 Ndiyo	Do you have sufficient food in the house these days to last a year?	20		78	94%	5	6%									83	0.06
21. Ni mwezi upi chakula hakitoshi? Mwaka 2018/Mwezi 1	Which months did you have insufficient food? 0=Insufficient, 1=Sufficient 2018/1st month	21.1		62	74%	22	26%									84	0.26
2	2	21.2		70	83%	14	17%									84	0.17
3	3	21.3		76	90%	8	10%									84	0.10
4	4	21.4		64	76%	20	24%									84	0.24
5	5	21.5		47	56%	37	44%									84	0.44
6	6	21.6		17	20%	67	80%									84	0.80
7	7	21.7		3	4%	81	96%									84	0.96
8	8	21.8		4	5%	80	95%									84	0.95
9	9	21.9		6	7%	78	93%									84	0.93
10	10	21.10		14	17%	69	82%									84	0.83
11	11	21.11		24	29%	60	71%									84	0.71
12	12	22.12		44	52%	40	48%									84	0.48
Jumla mwezi	Total months		5+													84	6.86
21a. Kama chakula hakitoshi; a) Umepata chakula cha porini? □ 0 Hapana □ 1 Ndiyo	When food was insufficient: Did you get food from the forest?	21a		38	46%	45	54%									83	0.54
b) Umepunguza idadi ya milo kwa siku? □0 Hapana □ 1 Ndiyo	Did you decrease the number of meals?	21b		3	4%	80	96%									83	0.96
c) Umeuza mifugo □0 Hapana □1 Ndiyo	Did you sell livestock?	21c		48	59%	33	41%									81	0.41
d) Mtoto amekula kwa ndugu au jirani? □0 Hapana □1 Ndiyo	Did children eat at relatives or neighbors?	21d		35	47%	39	53%									74	0.53
22. Ni yapi matumizi muhimu ya mapato yako? □ 1 Chakula	What are the important use of your income? 1 Food	22.1		18	22%	65	78%									83	0.78
□ 2 Nguo	Clothes	22.2		74	89%	9	11%									83	0.11
□ 3 Elimu	Education	22.3		62	75%	21	25%									83	0.25
□ 4 Afya	Health	22.4		66	80%	17	20%									83	0.20
□ 5 Shamba	Agriculture	22.5		71	85%	12	14%									84	0.14
□ 6 Mengineyo	Other	22.6	+	75	90%	8	10%									83	0.10

Swahili original	English translation	Entry code	+	0 (No / Hapana)	%	1 (Yes / Ndiyo)	%	2	%	3	%	4	%	5	%	Total n	Average
23. Nani anamaamuzi kuhusu matumizi ya fedha? □ 1 Mwanamke tu □ 2 Mwanaume tu □ 3 Mwanaume na mwanaume	23. Who decides about the use of income? 1 Women only 2 Men only 3 Women and men	23				14	9%	15	9%	129	82%					158	
24. Chunguza hali ya familia yako kati ya vijiji: □ 1 Maskini □ 2 Wastani □ 3 Tajiri	24. Chose the situation of your family within the village: 1 Poor 2 Average 3 Rich	24				21	15%	117	82%	4	3%					142	
Kuhusu kikundi	**About groups**																
25. Je umejiunga kwenye kikundi au vikundi vya kijamii vingapi? _____	25. How many groups are you participating in within the community?	25		61	86%	9	13%	1	1%							71	0.15
27. Je shuguli ya kikundi hicho ni nini? □ 1 Kilimo	27.1 What is the activity of this group? 1 Agriculture	27.1		9	90%	1	10%									10	0.10
□ 2 Dini	Religion	27.2		9	90%	1	10%									10	0.10
□ 3 Ngoma	Musical performance	27.3		10	100%	0	0%									10	0.00
□ 4 Mkopo	Saving and borrowing	27.4		3	30%	7	70%									10	0.70
□ 5	Other	27.5	+	8	80%	2	20%									10	0.20
Kusaidiana nje ya famila (=nyumba)	**About mutual assistance outside the family**																
28. Katika kipindi cha mwaka moja je kuna watu wa nje ya familia wamesaidia wakati umepata shida ya chakula? □ 0 Hapana □ 1 Ndiyo	28. Within this month, has anyone outside of your family help you when you needed food?	28		60	71%	24	29%									84	0.29
29. Katika kipindi cha mwaka moja je umewahi kusaidia watu wengine nje ya familia wakati wamepata shida ya chakula? □ 0 Hapana □ 1 Ndiyo	29. Within this month, have you helped anyone outside of your family when they needed food?	29		45	54%	39	46%									84	0.46
30. Katika kipindi cha mwaka moja je kuna watu moja je kuna watu nje ya familia wamesaidia wakati umepata shida ya pesa? □ 0 Hapana □ 1 Ndiyo	30. Within this month, has anyone outside of your family help you when you needed money?	30		54	64%	30	36%									84	0.36
31. Katika kipindi cha mwaka moja je umewahi kusaidia watu wengine nje ya familia wakati wamepata shida ya pesa? □ 0 Hapana □ 1 Ndiyo	31. Within this month, have you helped anyone outside of your family when they needed money?	31		61	73%	22	27%									83	0.27
32. Unafikiri watu wa kijiji chako wanasaidiana? □ 0 Hapana □ 2 Ndiyo	32. Do you think people in this village help each other?	32	+	21	27%	58	73%									79	1.47
Kuhusu watoto	**About children**																
33. Wakati ulipokuwa (mwenza wako) mjamzito ulipata chakula cha kutosha? □ 0 Hapana □ 1 Ndiyo	33. When you (or your partner) was pregnant did you (or your partner) get sufficient food?	33		15	21%	57	79%									72	0.79
34. Maziwa ya mama yanatosha? □ 0 Hapana □ 1 Ndiyo	34. Was breastmilk sufficient?	34		13	18%	59	82%									72	0.82
35. Watoto walianza kula chakula gani? □ 1 Uji wa:	35.1 What was your child's first food? 1 Porridge of:	35.1		8	11%	68	89%									76	0.89
□ 1 mahindi	maize	35.11		67	87%	10	13%									77	0.13
□ 2 mchele	rice	35.12		76	99%	1	1%									77	0.01
□ 3 mtama	sorghum	35.13		68	88%	9	12%									77	0.10
□ 4 muhogo	cassava	35.14		19	25%	58	75%									77	0.75
□ 5	other	35.15	+	74	96%	3	4%									77	0.04
□ 2 Kingine:	2 Other	35.2	+	67	99%	1	1%									68	0.01
36. Chakula cha watoto kinatosha? □ 0 Hapana □ 1 Ndiyo	36. Was children's food enough?	36		28	38%	45	62%									73	0.62
37. Nani anaamua mtoto mgonjwa apelekwe wapi? □ 1 Mke/mwanamke tu □ 2 Mume/mwanamme tu □ 3 Mume na mke/wote	37. Who decided to send the children where when s/he was sick? 1 Wife/women only 2 Husband/men only 3 Husband and wife/all	37				6	8%	6	8%	61	84%					73	2.75
Kuhusu Afya	**About health**																
41. Je kwa ujumla unaonaje hali yako kiafya? □ 5 Nzuri kupita kiasi □ 4 Nzuri sana □ 3 Nzuri □ 2 Ya wastani □ 1 Mbaya	41. [GH: General Health] In general would you say your health is: 5 Excellent 4 Very good 3 Good 2 Fair 1 Poor	41				8	10%	39	48%	23	28%	12	15%	0	0%	82	2.48
Shughuli zilizoorodheshwa hapa chini ni shughuli unazoweza kuzifanya kila siku. Je afya yako hivi sasa inakuzuia kufanya shughuli hizi? Kama ndivyo kwa kiasi gani? 42. Kazi za kawaida kama kuchota maji, kufua nguo, kubeba mtoto: □ 1 Ndiyo. Inazuia sana □ 3 Ndiyo. Inazuia kiasi □ 5 Hapana. Haizuii kabisa	42. [PH: Physical Functioning] The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so how much? 42. Moderate activities such as carrying water, washing clothes, and carrying children: 1 Yes, very limited 3 Yes, limited a little 5 No, not limited at all	42				9	11%			20	24%			53	65%	82	4.07

Swahili original	Entry code	English translation	+	0 No (Hapana)	%	1 Yes (Ndiyo)	%	2	%	3	%	4	%	5	%	Total n	Average
English		[Translation omitted when No/Yes question]															
Kufanya kazi nzito; Kupanda mlima mkali: ☐1 Ndiyo. Inazuia sana ☐3 Ndiyo. Inazuia kiasi ☐5 Hapana. Haizuii kabisa	43	Heavy activities; To climb a steep mountain: 1 Yes, very limited 3 Yes, limited a little 5 No, not limited at all				10	12%			21	26%			50	62%	81	3.99
Katika kipindi cha mwezi mmoja uliopita je umewahi kupata moja ya matatizo yafuatayo katika utendaji wako wa kazi ikiwa ni matokeo ya matatizo ya afya yako? ☐1 Ndiyo ☐5 Hapana	44	[RP: Role Physical] During a month have you had any of the following problems with your work or other regular daily activities as a result of your physical health? 44. Accomplished less than you would like? 1 Yes 5 No				30	37%									51	63%	81	3.52
Umeshindwa kufanya baadhi ya kazi au shughuli? ☐1 Ndiyo ☐5 Hapana	45	Were limited in the kind of work or other activities? 1 Yes 5 No				35	43%									46	57%	81	3.27
Katika kipindi cha mwezi mmoja uliopita uliwahi kupata moja ya matatizo yafuatayo katika utendaji wako wa kazi ikiwa ni matokeo ya mawazo? ☐1 Ndiyo ☐5 Hapana	46	[RE: Role Emotional] During a month have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? 46.Accomplished less than you would like? 1 Yes 5 No				45	55%									37	45%	82	2.80
Hukufanya kazi au shughuli zako kwa uangalifu kama ilivyo kawaida? ☐1 Ndiyo ☐5 Hapana	47	Did work or activities less carefully than usual? 1 Yes 5 No				46	57%									35	43%	81	2.73
Katika mwezi mmoja uliopita maumivu yalikuzuia kwa kiasi gani kufanya kazi zako za kila siku (ndani na nje ya nyumbani kwako)? ☐5 Hayakunizuia kabisa ☐4 Yalinizuia kiasi kidogo ☐3 Yalinizuia kwa wastani ☐2 Yalinizuia kwa kiasi ☐1 Yalinizuia kwa kiasi kikubwa sana	48	[BP: Body Pain] During a month how much did pain interfere with your normal work (including work outside the home and housework)? 5 Not at all 4 A little bit 3 Moderately 2 Quite a bit 1 Extremely				15	19%	11	14%	13	16%	11	14%	31	38%	81	3.40
Maswali yafuatyo yanahusu jinsi unavyojisikia kiafya vile vile jinsi gani shughuli zako zilivyofamikiwa kwa kipindi cha mwezi mmoja uliopita. Kwa kila swali tafadhali toa jibu lililo karibu na jinsi livyokuwa unajisikia. Je ni muda gani kwa kipindi cha mwezi mmoja uliopita umekuwa na yafuatayo: 49. Je ulijisikia mtulivu na wenye amani? ☐5 Muda wote ☐4 Muda mwingi ☐2 Muda mchache ☐1 Hakuna muda wowote	49	[MH: Mental Health] These questions are about how you have been feeling during the past one month. For each question please give the one answer that comes closest to the way you have been feeling. 49 Have you felt calm & peaceful? 5 All of the time 4 Most of the time 3 Some of the time 2 Some of the time 1 None of the time				5	6%	38	46%			9	11%	30	37%	82	3.26
Je ulikuwa na nguvu nyingi? ☐5 Muda wote ☐4 Muda mwingi ☐2 Muda mchache ☐1 Hakuna muda wowote	50	[VT: Vitality] Did you have a lot of energy? 5 All of the time 4 Most of the time 2 Some of the time 1 None of the time				6	7%	40	49%			9	11%	27	33%	82	3.13
Je ulijisikia kusononeka? ☐1 Muda wote ☐2 Muda mwingi ☐4 Muda mchache ☐5 Hakuna muda wowote	51	[MH] Have you felt down-hearted and blue? 1 All of the time 2 Most of the time 4 Some of the time 5 None of the time				17	21%	7	9%			43	52%	15	18%	82	3.39
Katika mwezi mmoja uliopita ni kwa muda gani matatizo ya kiafya au kimawazo yameathiri shughuli zako za kijamii (kama kutembeleana na marafiki ndugu na jamaa nk)? ☐1 Muda wote ☐2 Muda mwingi ☐4 Muda mchache ☐5 Hakuna muda wowote	52	[SF: Social Functioning] During the past one month how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends relatives etc)? 1 All of the time 2 Most of the time 4 Some of the time 5 None of the time				6	7%	12	15%			36	44%	27	33%	81	3.81
Kuhusu chakula		**About food**															
Chagua yote: Unakula chakula (nafakara, mizizi, ndizi) gani? 1 Wali/Mpunga	61.1	Choose all: What kinds of food do you eat (cereals, tubers, bananas)? 1 Rice		40	48%	44	52%									84	0.52
2 Mahindi	61.2	2 Maize		12	14%	72	86%									84	0.86
3 Mtama	61.3	3 Sorghum		13	15%	71	85%									84	0.85
4 Uwele/Ulezi	61.4	4 Millet		59	70%	25	30%									84	0.30

Swahili original (Swahili)	Entry code	English translation [Translation omitted when No/Yes question]	+	0 No (Hapana)	%	1 Yes (Ndiyo)	%	2	%	3	%	4	%	5	%	Total n	Average
5 Ungano	61.5	5 Wheat		54	64%	30	36%									84	0.36
6 Mhogo	61.6	6 Cassava		18	21%	66	79%									84	0.79
7 Viazi	61.7	7 Tubers		60	71%	24	29%									84	0.29
8 Ndizi	61.8	8 Bananas		53	63%	31	37%									84	0.37
9 Kingyine	61.9	9 Others	+	83	99%	1	1%									84	0.01
62. Mboga yako ni nini? 1 Nyama	62.1	What is your relish? 1 Meat		71	85%	13	15%									84	0.15
2 Samaki	62.2	2 Fish		4	5%	80	95%									84	0.95
3 Maziwa	62.3	3 Milk		67	80%	17	20%									84	0.20
4 Mikunde	62.4	4 Beans		28	33%	56	67%									84	0.67
5 Mboga mboga	62.5	5 Vegetables		31	37%	53	63%									84	0.63
6 Kingyine	62.6	6 Others	6+	83	99%	1	1%									84	0.01
63. Chagua moja tu kwa kila swali: Wakati wa kiangazi…. Unakula chakula (nafaka, mizizi, au ndizi) mara ngapi? *0 Sili 1 Chini ya siku 3 kila wiki 2 Siku 4,5,6 kila wiki 3 Mara 1 kila siku 4 Zaidi ya mara 2 kila siku	63	Choose one answer for each question: During the dry season: How many times do you eat staple food (cereals, tubers, or bananas)? * 0 Don't eat 1 Less than 3 days a week 2 4,5,6 days a week 3 Once everyday 4 More than 2 times a day		4	5%	9	11%	13	15%	27	32%	31	37%			84	2.86
64. Unakula mboga mboga mara ngapi? *	64	How many times do you eat vegetables? *		16	19%	49	59%	6	7%	9	11%	3	4%			83	1.20
65. Unakula nyama mara ngapi? **0 Sili 1 Mara 1 au chini kila wiki 2 Siku 2,3 kila wiki 3 Siku 4,5,6 kila wiki 4 Kila siku	65	How many times do you eat meat? **0 Don't eat 1 Once or less then once a week 2 2,3 days a week 3 4,5,6 days a week 4 Everyday		55	66%	24	29%	2	2%	0	0%	2	2%			83	0.43
66. Unakula samaki au dagaa mara ngapi? **	66	How many times do you eat fish or small fish? **		1	1%	2	2%	12	14%	14	17%	55	65%			84	3.43
67. Unakunywa maziwa mara ngapi? **	67	How many times do you drink milk? **		51	61%	26	31%	5	6%	1	1%	1	1%			84	0.51
68. Unakula mikunde mara ngapi? **	68	How many times do you eat beans? **		3	4%	28	34%	36	44%	7	9%	8	10%			82	1.87
69. Unakula mbegu mara ngapi? **	69	How many times do you eat seeds? **		14	17%	17	21%	25	30%	10	12%	16	20%			82	1.96
70. Unakula matunda mara ngapi? **	70	How many times do you eat fruits? **		23	27%	34	40%	16	19%	2	2%	9	11%			84	1.29
71. Unakula chakula nyinginyi ya pori mara ngapi? **	71	How many times do you eat other food from the forest? **		12	15%	40	49%	20	24%	5	6%	5	6%			82	1.40
72. Unatumia mafuta mara ngapi? *	72	How many times do you use oil? *		11	13%	38	45%	9	11%	16	19%	10	12%			84	1.71
73. Unatumia chumvi mara ngapi? *	73	How many times do you use salt? *		0	0%	0	0%	2	2%	14	17%	66	80%			82	3.78
Type of salt		Type of salt: 1.Traditional, sea, 2. Industrial, shop			0%	48	91%	5	9%							53	1.09
74. Untumia sukari mara ngapi? *	74	How many times do you use sugar? *		0	0%	3	4%	3	4%	45	54%	36	43%			82	3.36
75. Wakati ya masika…. Unakula chakula (nafaka, mizizi, au ndizi) mara ngapi? *	75	In time of rainy season… How many times do you eat staple food (cereals, tubers, or bananas)? *		1	1%	4	5%	15	18%	35	43%	27	33%			82	3.01
76. Unakula mboga mboga mara ngapi? *	76	How many times do you eat vegetables? *		1	1%	12	14%	13	15%	23	27%	35	42%			84	2.94
77. Unakula nyama mara ngapi? **	77	How many times do you eat meat? **		66	80%	10	12%	7	8%	0	0%	0	0%			83	0.29
78. Unakula samaki au dagaa mara ngapi? **	78	How many times do you eat fish or small fish? **		1	1%	5	6%	7	9%	14	17%	54	67%			81	3.42
79. Unakunywa maziwa mara ngapi? **	79	How many times do you drink milk? **		58	69%	13	15%	6	7%	0	0%	7	8%			84	0.63
80. Unakula mikunde mara ngapi? **	80	How many times do you eat beans? **		7	9%	13	16%	28	35%	7	9%	26	32%			81	2.40
81. Unakula mbegu mara ngapi? **	81	How many times do you eat seeds? **		19	23%	17	20%	27	33%	6	7%	14	17%			83	1.75
82. Unakula matunda mara ngapi? **	82	How many times do you eat fruits? **		10	12%	19	23%	26	32%	6	7%	20	25%			81	2.09
83. Unakula chakula nyinginyi ya pori mara ngapi? **	83	How many times do you eat other food from the forest? **		8	10%	22	27%	19	23%	9	11%	25	30%			83	2.25
84. Unatumia mafuta mara ngapi? *	84	How many times do you use oil? *		20	24%	32	38%	4	5%	15	18%	13	15%			84	1.63
85. Unatumia chumvi mara ngapi? *	85	How many times do you use salt? *		0	0%	0	0%	1	1%	13	16%	69	83%			83	3.82
Type of salt		Type of salt: 1.Traditional, sea, 2. Industrial, shop			0%	25	89%	3	11%							28	1.11
86. Untumia sukari mara ngapi? *	86	How many times do you use sugar or eat sugarcane? *		0	0%	1	1%	3	4%	48	57%	32	38%			84	3.32

Note: ( ) Questions selectively asked; + Further information available; Number+= Information available in the respective table; - = Confidential; * and ** =Frequency categories

Table 3. Age groups of respondents (Q2ab)

Age groups	Women	Men	Total	%
10	3	2	1	1.2
20	1	0	16	19.0
30	10	6	25	29.8
40	13	12	18	21.4
50	15	3	8	9.5
60	2	6	9	10.7
70	7	1	2	2.4
Unknown	2	0	5	6.0
Total	**53**	**30**	**84**	**100**

Table 4. Ethnic groups of respondents (Q4)

Ethnic groups	Number	%
Mwera	52	61.90
Makonde	15	17.86
Makua	3	3.57
Yao	3	3.57
Machinga	2	2.38
Matumbi	2	2.38
Hehe	1	1.19
Sambaa	1	1.19
Unknown	5	5.95
Total	**84**	**100**

Table 5. Numbers of household members and livestock, and months of food sufficiency

Entry code	English translation	n	Average	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	...	20	Total
13a	How many people live in your house?	82	4.05		5	9	15	25	13	9	5			1								82
					6%	11%	18%	30%	16%	11%	6%			1%								100%
10.2(2)	How many chicken did your family get for bridewealth?							1	2					2					1		1	7
	How many goats for bridewealth?				1																	1
16Kuku	How many chicken do you have?	31	7.90		3	2	2	1	3	7	1			3	2	1			4		2	31
					10%	6%	6%	3%	10%	23%	3%			10%	6%	3%			13%		6%	100%
16Mbuzi	How many goats do you have?	11	5.55		2	1	2	1	1	1		1					1		1			11
					18%	9%	18%	9%	9%	9%		9%					9%		9%			100%
21.1	How many months do you have sufficient food?	84	6.86	2			1	9	7	18	12	17	9	4	1	3						81
				2%			1%	11%	9%	22%	15%	21%	11%	5%	1%	4%						100%

Presently, the majority of respondents are married (73%), but 10% are unmarried, 10% are divorced, and 6% are widowed. Most of their marriages were monogamy (73%), but 21% (13) of the husbands had 2 wives, 5% (3) had 3 wives and another 2% (1) had 4 wives. Majority (79%) lived with their spouses. Average of people living under the same roof was 4.05, ranging from 1 to 10 people. The most common number of people living under the same roof were four (31%), followed by three (18%), five (16%), two (11%), six (11%), one (6%), seven (6%), and 10 (1%, Table 5). Almost half of the respondents (35, 47%) had one child under-5 in the house, followed by two children (5, 7%), and also up to three children (1, 1%, Table 2, 13b).

As for the nutrition status (weight) of children under-5, 69% understood it as "good / sufficient (green)", 16% considered it as average which could become "insufficient (gray)", but none considered it "bad / insufficient (red)". Seven respondents (16%) did not know the status (Table 2, 13c).

Among the respondents, 25% of them experienced death of children under-5: 12 respondents (18%) lost one child, two respondents (3%) lost two children, and two respondents (3%) lost five children (Table 2,

14). Most of them did not know the reason of child death (11, 65%), but one (6%) each indicated death right after birth, malaria, convulsion, kidney problem, problems walking, and accident by falling.

3. About livelihood

Majority of the respondents are farmers (94%), but 4% do business. Only two (2%) consider keeping livestock as an occupation. For other occupations, one was a student and another was a patient most probably unable to work (Table 2, 15).

Although not an occupation, half of respondents (44, 56%) had some kinds of livestock: 31 respondents (70%) had chicken ranged from one to 20, 11 (25%) had goats ranged from one to 15, and four (9%) had one or four cows. Numbers of chicken and goats are indicated in Table 5.

Almost all of the respondents (96%) had farms and 4% had gardens. The major crop was cassava (47%), followed by sorghum (35%), cashew nuts (30%), and sesame (17%). None of the respondents produced rice. Nearly all of them (90%) cultivated their crops for food and some (34%) for business. Most (77%) answered that they made decisions about the crops

together with their partners, but 12% each decided with either women or men only (Table 2).

Most of the respondents (94%) indicated that they did not have sufficient food these days to last a year. Most of them (71% to 96%) had sufficient food during June to November (in 2018 data).

March was the month when most respondents (90%) lacked food followed by February (83%), April (76%), May (56%), and December (52%, Table 2). Average month of food sufficiency was 6.9 months, but ranged from none of the month to 12 months (Table 5). Eighteen respondents (22%) had enough food six months a year; 17 (21%) had for eight months; 12 (15%) for seven months; nine (11%) for nine months; seven (9%) for five months.

When food is insufficient, 96% of the respondents decrease the number of their meals, 54% get wild foods from the forest, 53% let children eat at relatives or neighbors' houses, and 41% sell livestock. Example of wild plant foods in time of hunger are Ming'oko (2, 4%), Vitoro (2, 4%), Usofu, Lipwawa, and Uwanga/ Ulanga (Table 6).

Majority of respondents (78%) considered that buying food is the most important use of income, followed by education (25%), health (20%), and agriculture (14%). Majority (73%) answered that they made decisions about the use of their income together with their partners, but 19% by men only and 9% by women only. Half of the respondents (52%) considered their situations as average within the village, whereas 48% considered themselves as a poor. None considered themselves as a rich.

4. About groups

Majority of the respondents (86%) were not participating in any groups within the community, but 13 % participated in one group, and 1% in two groups. Main objectives of the groups were saving and borrowing (7, 70%), followed by helping each other (2, 20%), agriculture (1, 10%), and religion (1, 10%).

5. About mutual assistance

Within a month, only 29% were helped when they needed food. However, almost half (46%) considered themselves helping other people outside of their families who needed food. On the other hand, 36% were helped by others when they needed money, and 27% considered themselves helping other people outside of their families in the form of money. However, majority of the respondents (73%) generally considered that people in the village help each other.

6. About children

Majority considered that they had enough food during their pregnancy (79%), and breastfeeding was also sufficient (82%). The most common children's first food was porridge (89%) from cassava (75%), maize (13%), sorghum (12%), and rice (1%).

More than half (62%) considered that children's food was sufficient. Majority (84%) answered that both husband and wife decided together about their children when they were sick, but 8% each decided alone (Table 2).

7. About health (SF-12)

[GH: General Health] In general, 48% of the respondents considered that they had fair health, 28% good health, 15% very good health, and 10% as poor health. None considered themselves as excellent health.

[PF: Physical Functioning] In relation to moderate activities, 65% felt that they were not limited at all, 24% as limited a little, and 11% very limited. As for heavy activities, 62% were not limited at all, 26% were limited a little, and 12% were very limited.

[RP: Role Physical] During a month, more than half of the respondents (63%) felt that they accomplished works and daily activities less than their expectations due to physical health problems. However, the respondents who were limited in the kind of works or activities were only slightly low (43%) in comparison to those who were not limited in works or activities (57%).

[RE: Role Emotional] Slightly more respondents felt that they accomplished less than they would like

to (55%) due to emotional problems in comparison to those who disagreed (45%). Furthermore, more than half indicated that they worked less careful than usual (57%) due to emotional problems in comparison to those who felt that they worked carefully (43%).

[BP: Body Pain] Many of the respondents indicated that pain did not interfere with their normal works at all (38%), but 19% indicated an extreme interference, 16% indicated moderate interference, 14% quite a bit, and another 14% a little bit.

[MH: Mental Health] In regard to feelings, 46% felt calm and peaceful some of the time, 37% all the time, 11% most of the time, and 6% none of the time. Those who felt down-hearted and blue some of the time were 52%, all of the time were 21%, none of the time were 18%, and most of the time were 9%.

[VT: Vitality] Among the respondents, 49% felt a lot of energy some of the time, 33% felt all of the time, 11% felt most of the time, and 7% felt none of the time.

[SF: Social Functioning] In regard to physical health or emotional problems interfering with social activities, 44% considered it some of the time, 33% as none of the time, 15% as most of the time, and 7% all the time.

8. About food intake

The most typical staple foods were maize (86%), sorghum (85%), cassava (79%), rice (52%), bananas (37%), wheat (36%), millet (30%), and tubers in general (29%). As for relish, 95% of the respondents indicated fish or small fish, 67% beans, 63% vegetables, 20% milk, and 15% meat.

The frequency of food intake of the various food groups in each season is indicated in Diagram 1. During the dry season (June to November), 37% of the respondents eat staple foods more than twice a day. As for vegetables, 59% eat less than 3 days a week. As for fish or small fish, 65% eat it everyday. As for beans, 44% eat it 2 or 3 days a week, and 30% eat seeds 2 or 3 days a week. However, 66% do not eat meat, and 61% do not drink milk.

Foods from the forest are eaten by 49% once or less a week. Major wild foods eaten in the dry season are staple food such as Ming'oko (*Dioscorea hirtiflora* subsp. *orientalis*, 12 responses) and Uwanga/Ulanga (*Tacca leontopetaloides*, 10), but fruits such as Makoe (*Hyphaene coriacea*, 6), and vegetable that grows on the rocks in the ocean, Mboga pwani (*Sesuvium portulacastrum*, 3), are also eaten (Table 6). Forty percent eat fruits once or less than once a week.

Eighty percent use salt more than twice everyday, and 54% use sugar once everyday, and 45% use oil less than three days a week. Majority (91%) use traditional salt from the seas, whereas only 9% use industrialized salt of shops.

During the rainy season (December to May), 43% eat staple food everyday. As for vegetables, 42% eat it more than twice everyday. As for fish or small fish, 67% eat it during rainy season everyday. Thirty-five

Table 6. Wild foods indicated in the questionnaire

Local name	Scientific name	Type of food	Q21 Food in hunger	Q71 Dry Season	Q76 Vegetable in rainy season	Q83 Rainy season	Total
Vitoro, Mtoro	*Landolphia kirkii*	fruit	2	5		11	18
Usofu, Msofu	*Uvaria lucida*	fruit	1	4		11	16
Makoe, Mkoe	*Hyphaene coriacea*	fruit		6			6
Mabungo	*Landolphia parvifolia*	fruit		2		3	5
Ububudu	*Grewia sp.*	fruit	2			2	4
Matonga	*Strychnos spinosa*	fruit		2		2	4
Lipwawa	*Flagellaria guineensis*	fruit	1			1	2
Matopetope	*Annona senegalensis*	fruit				1	1
Ufuru	*Vitex sp.*	fruit			1	1	2
Mabibo	*Anacardium occidentale*	fruit		1			1
Ming'oko	*Dioscorea hirtiflora subsp. orientalis*	staple	2	12		1	15
Ulanga, Uwanga	*Tacca leontopetaloides*	staple	1	10			11
Lilende	*Corchorus aestuans*	vegetable		3	3	6	12
Mboga pwani	*Sesuvium portulacastrum*	vegetable		3		1	4
Mtolilo	(unidentified)	vegetable		1	1	2	4

Note: Wild animal (*Nyama ngonde*) and cultivated food in local names, water melon (*Kumbila*) and cassava (*Kondole*), were also indicated.
Source: Local names were matched with identified species in the same village by Frank M. Mbago.

Diagram 1. The frequency of food consumption

Dry-season
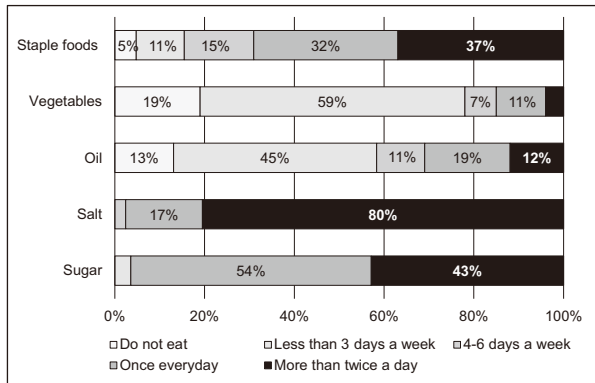
Rainy season
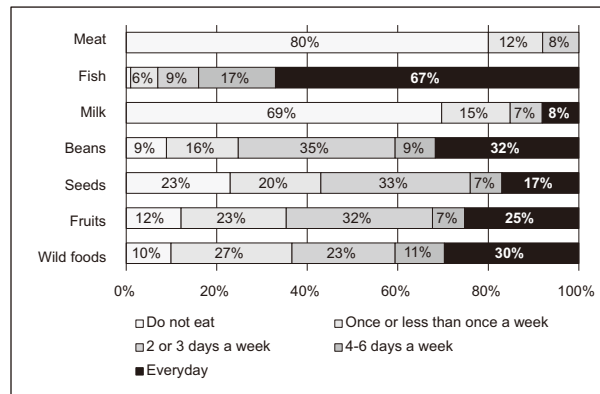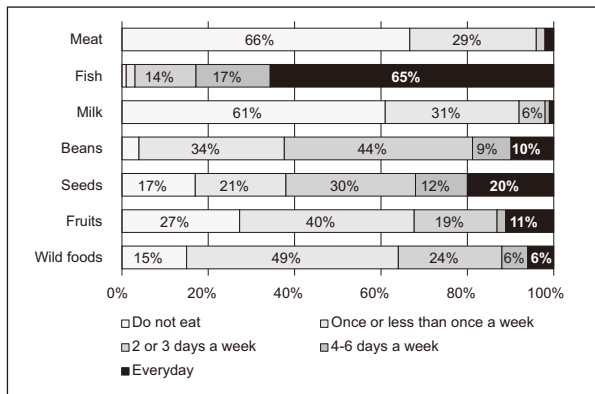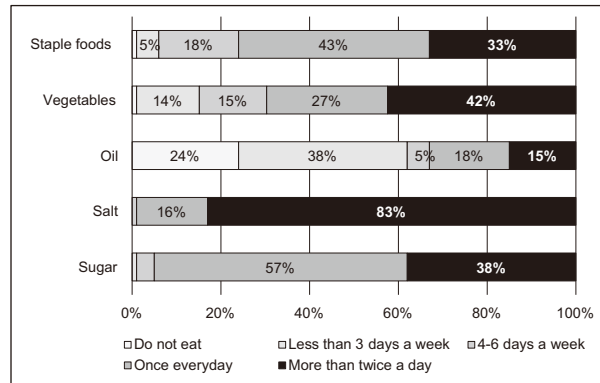
Source: Formulated by Khemmarath

**Diagram 2. Food sufficiency/insufficiency 1.in 2018**
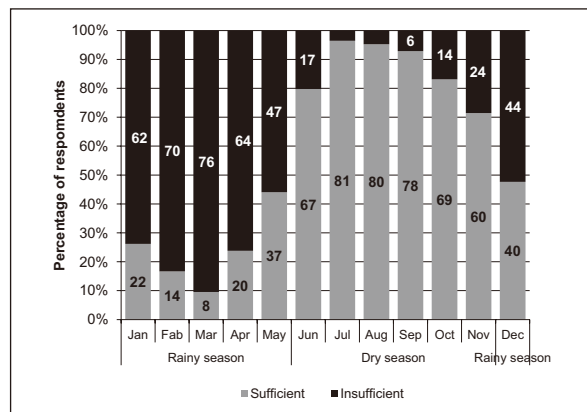
Source: Formulated by Khemmarath

percent eat beans 2 or 3 days a week. However, 80% do not eat meat during rainy season, and 69% do not drink milk. Thirty-two percent eat fruits 2 or 3 days a week.

Thirty percent eat wild foods from the forest everyday. Major examples of food from the forest eaten in the rainy season are fruits such as Vitoro (*Landolphia kirkii*) and Usofu (*Uvaria lucida*), both 11 responses each. Vegetable such as Lilende (*Corchorus aestuans*) is also eaten (Table 6).

Salt is used more than twice everyday by 83%, sugar is used once everyday by 57%, and oil used less than three times a week by 38%. Majority use traditional sea salt (25, 89%), whereas a few use industrial salt from the shop (3, 11%, Table 2).

II. Analysis

1. Quantity of food intake

Majority considered that they had enough food during pregnancy (79%), and that children had enough breastfeeding (82%), and enough food for children (62%). However, majority considered that they did not have enough food throughout the year (94%). Food shortage was a big issue for the majority especially from December to May (Diagram 2), and 90% did not have sufficient food in March.

Unlike the food sufficiency in Ifunda, Iringa Region in the previous similar questionnaire[18], the lack of food in the rainy season and its magnitude is common with the case of Chinangali I Village of Dodoma Region[19]. However, the peak of food insufficiency already started in October and

continued in Dodoma Region, whereas the peak was at March in Kijiweni Village of Lindi Region.

2. Balance of food intake

In Kijiweni, maize, sorghum, and cassava is the main staple food, and fish, beans, and vegetables are the main relish (Diagram 3-1, 3-2). According to the average of responses, many people eat fish at least four to six days a week (Diagram 4).

Staple food is eaten almost everyday, but slightly increases in the rainy season. It is not clear why frequency of food intake increases when there is food insufficiency.

Most other foods also increase in the rainy season except seeds, meat, and milk. Vegetable drastically increases from more or less than three days a week to almost everyday. Beans, fruits, and food from the forest also increase from more or less than once a week to more than two or three days a week. On the other hand, seeds decrease from almost two to three days a week to more than once a week. Meat and milk, which is rarely taken, is less than once a week decreasing further in the rainy season.

Salt and sugar is used more than once a day, whereas oil is only taken more or less than 3 days a week. There is not much fluctuation of salt, sugar, and oil between

Diagram 3-1. Common staple foods
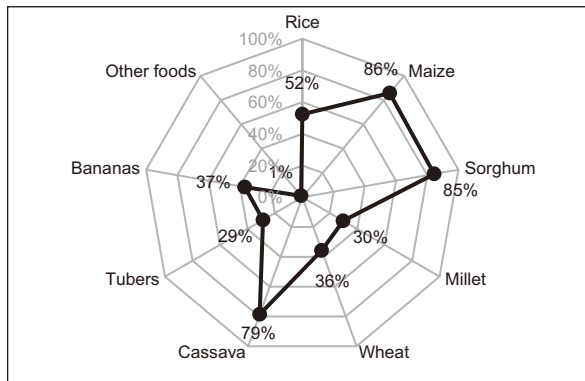
Source: Formulated by Khemmarath

Diagram 3-2. Common relish
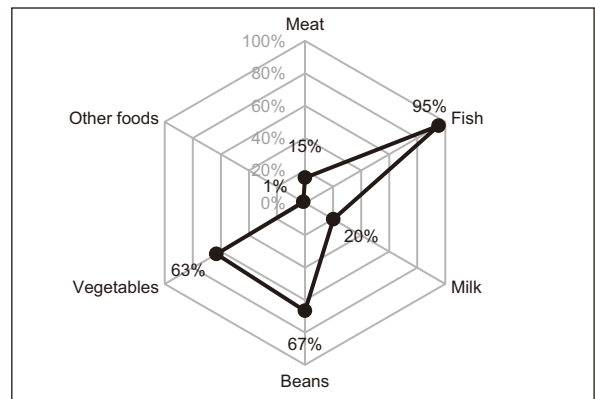
Diagram 4. Average food category intake by seasons
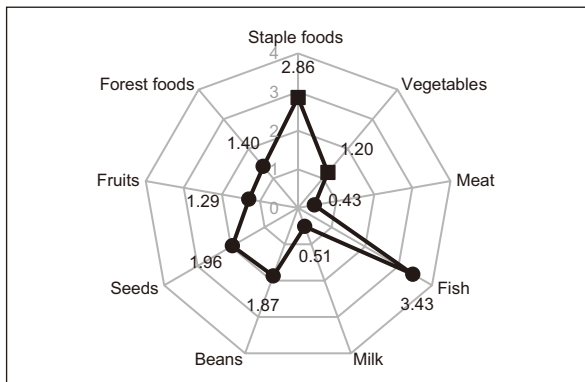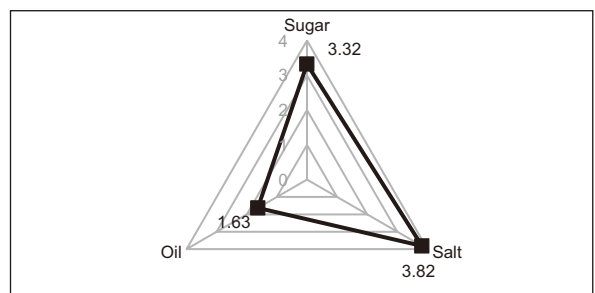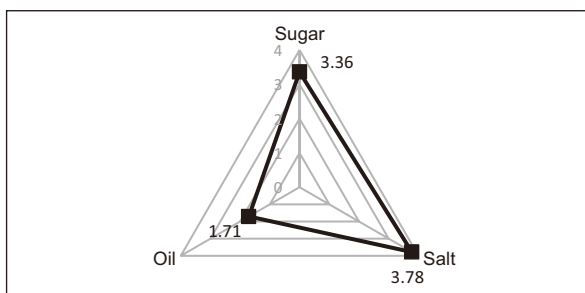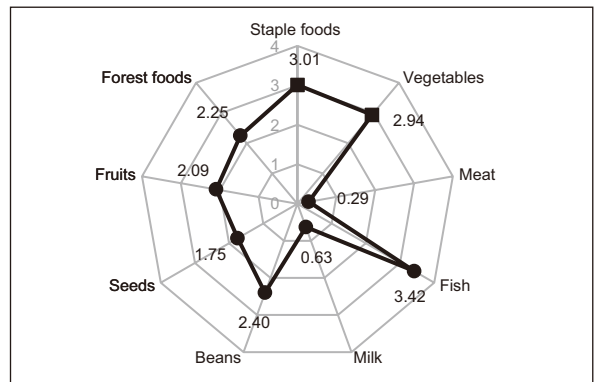
Note: ■ = 4: More than twice a day, 3: Once everyday, 2: 4,5,6 days a week, 1: Less than 3 days a week, 0: Don't eat
● = 4: Everyday, 3: 4,5,6 days a week, 2: 2,3 days a week, 1: Once or less than once a week, 0: Don't eat

seasons. Salt is most frequently taken, based on availability of traditional salt from the ocean.

Being a coastal village, the consumption of fish is outstanding in comparison to above inland villages in Dodoma and Iringa. Increase of the consumption of vegetable from the dry season to rainy season is also outstanding in comparison to the same villages. Salt is most frequently consumed, but oil is least consumed in comparison to the other villages.

3. Decision making and social capital

Majority responded that they make decision within the household together with men and women, especially to decide where to send their child where when s/he is sick (84%), followed by usage of crops (77%) and usage of income (73%). Majority responded that villagers help each other (73%), but majority have not been helped or helped others for food nor money within this month. Having said that, relatively more people helped others with food (46%), and have been helped with money (36%). Additionally, there are more responses that they get help for money in comparison to helping others for money (27%). This may be related to the fact that 52% consider their wealth situation as average, and 48% as poor: That is, those who consider themselves average may be helping those that consider themselves poor. Only 13% belong to groups (e.g. saving and borrowing).

Tendency that majority of the respondents make decisions with their partners, and the fact that more made decisions together about children's sickness, followed by about crops, and income in this order were common with the other results in Dodoma and Iringa Regions. The tendency that the majority of the respondents consider that the villagers help each other in spite of the fact that less people actually helped or were helped with food or money within this month was common to other results in Dodoma and Iringa Regions. However, it was unique to this village that there are more responses that they get help for money in comparison to helping others for money.

4. Children's nutrition and survival

Sixteen percent of children were moderately underweight. Although the cut-off point is likely to be

different from the national data, it is higher than the national average of 13%, the Lindi regional average of 11%, and the MDG target of 12.5%. The percentage of children moderately underweight is higher than that of the above research in Dodoma which had 10%, and even considering that 10% did not know the nutrition status of children. In Ifunda, Iringa Region, 2% were severe underweight and 9% with moderate. Although they had more severe cases, the total percentage of underweight is higher in Kijiweni.

Among the respondents, 17 people (25%) experienced the loss of a child before the age of five. Number of children's death adds up to 26 children. This is much lower than the percentage of 49% adding up to 68 children in Chinangali I Village in Dodoma Region in a similar questionnaire[20]. Average age of respondents are 45.83 years in the research in Chinangali which is comparable to this research with 41.04 years.

5. Subjective health evaluation of adults

Diagrams 5-1 to 5-5 provide the distribution of the respondents answer to each questions related to subjective

Diagram 5-1. General Health (GH)
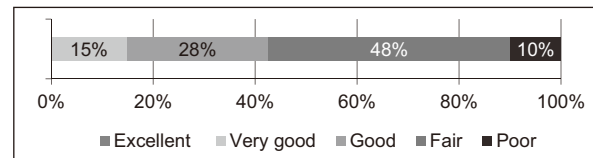
Diagram 5-2. Physical functioning (PH): Does your health limit you from these activities?
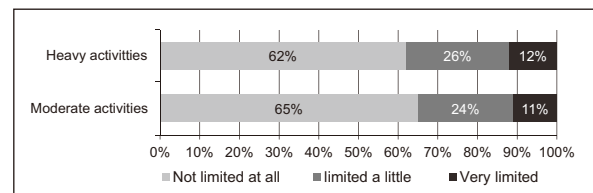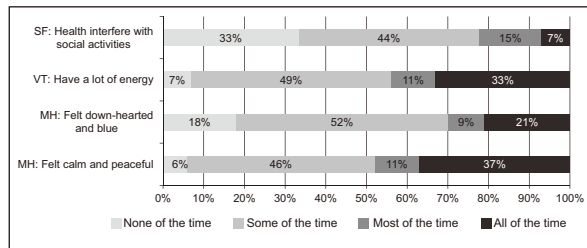

Diagram 5-3. Role Emotional (RE) and Role Physical (RP): Have you had any problems with your work or regular daily activities?
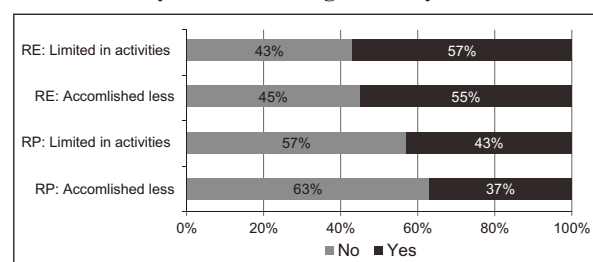
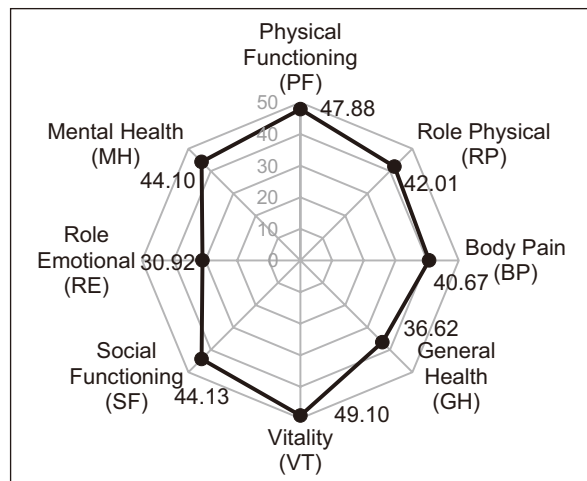**Diagram 5-4. Body Pain (BP): How much did pain interfere your normal work?**
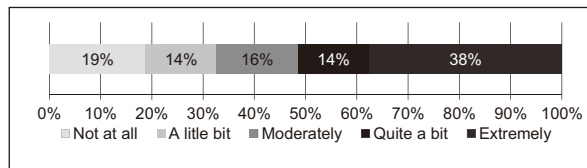
Diagram 5-5. Mental Health (MH), Vitality (VT), and Social Functioning (SF)interfere your normal work?

Source: Formulated by Khemmarath

Diagram 6. Subjective health evaluation

Source: Calculated by Khemmarath with reference to Ware et al, 1995.

health. The scores of subjective health is calculated in reference to SF-12 (Diagram 6). According to the calculation, the score ranges from 30.92 to 49.10: Role Emotional [RE] is the lowest and Vitality [VT] is the highest.

Conclusion, and future analysis

Children's underweight is relatively high in Lindi Region, and the results of the research confirmed and also situated this village as having relatively higher underweight than the regional average. The study also underlined the general understanding of the village to have lack of food.

Consumption of fish was outstanding in comparison to other inland villages as generally understood. In addition, the consumption of food was extremely low in the dry season and increased in the rainy season, which was not consistent with the season of food insufficiency, nor results in other regions. As for health evaluation, villagers had high VT and low RE as in other villages of other Regions. It was also noted that more respondents were helped with money rather than helping others with money.

These findings are not conclusive, but preliminary. The following analysis are planned to further understand the situation: (i) In-depth analysis of food intake and subjective health situation; (ii) analyzing correlations between manifestation of health/nutrition status and other factors; and (iii) further comparison with other regions based on the same questionnaire. Furthermore, individual responses on respondent's subjective health evaluation and food intake will be provided as feedback so that it may give an opportunity for improvement of individual health.

[1] Tanzania (2015), p.33.
[2] TFNC (2014), pp.10-11.
[3] Tanzania (2011), p.10.
[4] TFNC (2014), pp.10, 39.
[5] TFNC (2014), pp.10-11, 43.
[6] TFNC (2014), pp.47-48.
[7] Tanzania (2015), pp. 32-33.
[8] Tanzania (2006), p.5
[9] Tanzania (2015), p.102

[10] Sakamoto (2020), p.96.
[11] Based on field research in the village in September 2019.
[12] Wyss, Wagner et al. (1999).
[13] Tsunoda et al. (2015) and Mizoguchi et al. (2004).
[14] Tanzania (2008).
[15] Narayan (2004).
[16] Sakamoto (2007, 2008, 2015a, b, 2016, 2020).
[17] Ohmori et al. (2020).
[18] Sakamoto et al. (2020a).
[19] Sakamoto et al. (2020b).
[20] Sakamoto et al. (2020b).

References

Mizoguchi Keiko, Takemi Yukari, and Adachi Miyuki, 2004, "Relationship Between and Positive Perception Toward Work and the Dietary Habits of Young Male Workers", *The Japanese Journal of Nutrition and Dietetics*, vol.62, no.5, pp.269-283, https://www.jstage.jst.go.jp/article/eiyogakuz ashi1941/62/5/62_5_269/_article/-char/en

Narayan, Deepa, Veronica Nyham Jones, and Michael Woolcock, 2004, *Measuring Social Capital: An Integrated Questionnaire*, World Bank, http://documents.worldbank.org/curated/ en/515261468740392133/Measuring-social-capital-an-integrated-questionnaire

Ohmori Reiko, Sakamoto Kumiko, and Tsuda Katsunori, 2020, "Association Between Food Intake and Health-related Quality of Life in East Africa: From Pilot Study in Two Regions of Tanzania", *Journal of the School of Regional Design, Utsunomiya University*, no.7, pp.35-42. http://hdl.handle.net/10241/00012127

Sakamoto Kumiko, 2007, "Mutual Assistance and Gender under the Influence of Cash Economy in Africa: Case Study From Rural Southeast Tanzania", *Journal of the Faculty of International Studies*, Utsunomiya University, no.23, pp.33-54. http://hdl.handle.net/10241/6481

Sakamoto Kumiko, 2008, "Mutual Assistance and Gender Under the Influence of Cash Economy in Africa, Part 2: Case Study From Inland Rural Southeast Tanzania", *Journal of the Faculty of International Studies, Utsunomiya University*, no.25, pp.25-43. http://hdl.handle.net/10241/2228

Sakamoto Kumiko, 2015a, "Situation of Women and Children in Central Tanzania: Preliminary Report From a Questionnaire Interview in Majeleko Village, Dodoma", *Journal of the Faculty of International Studies, Utsunomiya University*, no.39, pp.133-150. http://hdl.handle.net/10241/9613

Sakamoto Kumiko, 2015b, "Situation of Women and Children in Southeast Tanzania: Preliminary Report From a Questionnaire Interview in Mchinga II Village, Lindi", *Journal of the Faculty of International Studies, Utsunomiya University*, no.39, pp.151-170. http://hdl.handle.net/10241/9614

Sakamoto Kumiko, 2016, "Situation of Women and Children in North Unguja, Zanzibar: Preliminary Report From a Questionnaire Interview in Chaani Masingini", *Journal of the Faculty of International Studies, Utsunomiya University*, no.41, pp.189-208. http://uuair.lib.utsunomiya-u.ac.jp/dspace/handle/10241/10148

Sakamoto Kumiko, 2020, *Factors Influencing Child Survival in Tanzania: Comparative Analysis of Diverse Deprived Rural Village,* Springer.

Sakamoto Kumiko, Ohmori Reiko, and Okui Ayusa, 2020a, "Situation of Women and Children in Southern Tanzania: From Questionnaires in Ifunda, Iringa with Focus on Food-intake and Health", *Journal of the School of International Studies*, *Utsunomiya University*, no.49, pp.69-78. http://hdl.handle.net/10241/00012115

Sakamoto Kumiko, Ohmori Reiko, and Tsuda Katsunori, 2020b, "Health, Livelihoods, and Food Intake of Children in Chinangali I Village, Chamwino District, Dodoma Region*"*, *Science of Regional Design*, Utsunomiya University. vol.7, 43-64.http://hdl.handle.net/10241/00012127

Tanzania, Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam; Tanzania Food and Nutrition Centre (TFNC), Dar es Salaam; and Harvard School of Public Health (HSPH), Boston, USA, 2008, *Tanzania Food Composition Tables*, http://ihi.eprints.org/3035/1/tanzania-food-composition-tables.pdf

Tanzania, National Bureau of Statistics and ICF Macro, 2011, *2010 Tanzania Demographic and Health Survey: Key Findings*, Calverton, Maryland, USA: NBS and ICF Macro. https://www.dhsprogram.com/pubs/pdf/SR183/SR183.pdf (Accessed 29 Sept. 2019).

Tanzania, United Republic of, 2006, *Infant and Child Mortality Report, Census 2002*, vol. 4, Dar es Salaam National Bureau of Statistics.

Tanzania, United Republic of, 2015, *Mortality and Health*, Dar es Salaam National Bureau of Statistics, Ministry of Finance and Office of Chief Government Statistician, Ministry of State, President Office, State House and Good Governance. www.nbs.go.tz/nbs/takwimu/census2012/Mortality_and_Health_Monograph.pdf (Accessed 27 March 2016).

TFNC (Tanzania Food and Nutrition Center), 2014, *Tanzania National Nutrition Survey 2014*, Dar es Salaam: The United Republic of Tanzania, Ministry of Health and Social Welfare. http://www.lishe.org/tanzania-national-nutrition-survey-2014-final-report/ (Accessed 1 Oct. 2016).

Tsunoda N., InayamaT., Hata K., and Oka J., 2015, "Vegetable Dishes, Dairy Products and Fruits are Key Items Mediating Adequate Dietary Intake for Japanese Adults with Spinal Cord Injury", *Spinal Cord*, no.53, pp.78-790, https://www.ncbi.nlm.nih.gov/pubmed/25962372

Ware, John E., Mark Kosinski, and Susan D Keller, 1995, *SF-12: How to Score the SF-12 Physical and Mental Health Summary Scales*, The Health Institute, New England Medical Center, Boston, Massachusetts.

Wyss, Kaspar, Anita Wagner, David Whiting, D.M. Mtasiwa, Mathew Tanner, Barbara Gandek, and P.M. Kilima, 1999, "Validation of the Kiswahili Version of the SF-36 Health Survey in a Representative Sample of an Urban Population in Tanzania", *Quality of Life Research,* vol. 8, nos. 1-2, pp.111-20, DOI: 10.1023/A:1026431727374

Health, Livelihoods, and Food Intake in Coastal Southeast Tanzania:

From Questionnaires Interviews in Kijiweni Village, Lindi Region

SAKAMOTO Kumiko, Parinya KHEMMARATH, OHMORI Reiko, and Anna C. MARO

Abstract

Lindi Region has a relatively high percentage of stunting, although it decreased from 54% (2010) to 36% (2014). Kijiweni Village, situated on the coast in Lindi Rural District, with food shortage experience, was selected for the study on villager's health, livelihoods, food intake, and utilization of wild food. The results were compared with those of villages in Dodoma and Iringa regions. For example in 2018, food was insufficient among the majority from January to May and in December during the rainy season, where the situation was better than Dodoma, but worse than Iringa. However, frequency of food intake including that of wild food increased in the rainy season, different from other research areas. Consumption of fish was outstanding and 18 wild foods were mentioned including halophytic vegetable Mboga pwani (*Sesuvium portulacastrum*) from the ocean. Subjective health by SF-12 indicated high Vitality (VT) and low Role Emotional (RE) as in other areas. Further analysis is necessary to understand the contribution of food intake and other factors on health situations.

Afya, Maisha, na Ulaji Kusini Mashariki Pwani mwa Tanzania:

Uchunguzi kifani wa kijiji cha Kijiweni, Mkoani Lindi

SAKAMOTO Kumiko, Parinya KHEMMARATH, OHMORI Reiko, and Anna C. MARO

Ikisiri

Mkoa wa Lindi una asilimia kubwa ya udumaji, ingawa ulipungua kutoka 54% (2010) hadi 36% (2014). Kijiji cha Kijiweni, kinachopatikana Wilaya ya Lindi Kijiini, powani, ambacho kwa kawaida kina upungufu wa chakula, kilichaguliwa kwa ajili ya utafiti kuona hali ya afya ya wanakijiji, maisha, ulaji wa vyakula vya kawaida, na wa vyakula mwitu. Matokeo ya utafiti yalilinganishwa na ya vijiji vya mikoa ya Dodoma na Iringa. Kwa mfano, mwaka 2018, chakula kilikuwa haba kwa wengi kuanzia Januari hadi Mei na Disemba kipindi cha msimu wa mvua, hali iliyokuwa nzuri zaidi kuliko Dodoma, lakini mbaya kuliko Iringa. Hata hivyo, mdafao wa ulaji uliongezeka kipindi cha msimu wa mvua wakati kulikuwa na uhaba wa chakula (chakula cha porini pia), tofauti na maeneo mengine ya utafiti. Ulaji wa juu uliotajwa ulikuwa wa samaki na vyakula mwitu 18 ikiwa ni pamoja na Mboga pwani (Sesuvium portulacastrum) kutoka baharini. Afya ya unafsivu kwa njia ya hojaji SF-12 ilionesha kuwa na Nguvu (VT) na Mawazo na kazi (RE) kama maeneo mengine. Uchambuzi wa ziada ni muhimu ili kuelewa mchango wa ulaji na mambo mengine yahusuyo hali za kiafya.