Factors associated with child malnutrition in mountainous ethnic minority communities in Lao PDR

Sayvisene Boulom[1,3], Dirk R. Essink[2], Myung-Hee Kang[1],Sengchanh Kounnavong[2], Jacqueline E.W. Broerse[3]

1.Rural Economic and Food Technology Department, Faculty of Agriculture, National University of Laos, PhD Candidate at Athena Institute, Vrije Universiteit Amsterdam, boulom.s@hotmail.com. 2 Lao Tropical and Public Health Institute, 3. Athena Institute, Faculty of Science, Vrije Universiteit Amsterdam

1

Survey team: NSA/CANTEEN team in Nong district, Savannakhet province

2

NSA: Nutrition Sensitive Agriculture

Household intervention

- Home garden, Fish pond, Lay egg chicken and water supply

MCNV
www.mcnv.org

CANTEEN

Collaboration
And
Networking
To
Enhance
Education &
Nutrition

Jan 2016 – Jun 2021

MCNV
www.mcnv.org

3

Background

- Malnutrition is a serious global health problem [1].
- Low- and middle-income countries (LMICs) have been mostly faced with undernutrition, including underweight, wasting and stunting
- Based on field reports and the scarce scientific evidence, in Lao PDR there are pockets where malnutrition is much higher than the averages provided by national statistics.
- These areas hardly benefit from national policies targeting nutrition, and risk falling even further behind in socio-economic development.
- Demonstrating the inequitable distribution of poor nutritional status is the first step in solving it

4

Objectives:

The study aimed to identify the extent of malnutrition and factors associated with it among children aged 12-47 months in remote mountainous communities in Lao PDR.

Hypothesis:

The underlying causes are the main factors of malnutrition in children aged between 12 and 47 months in Nong district, Savannakhet province.
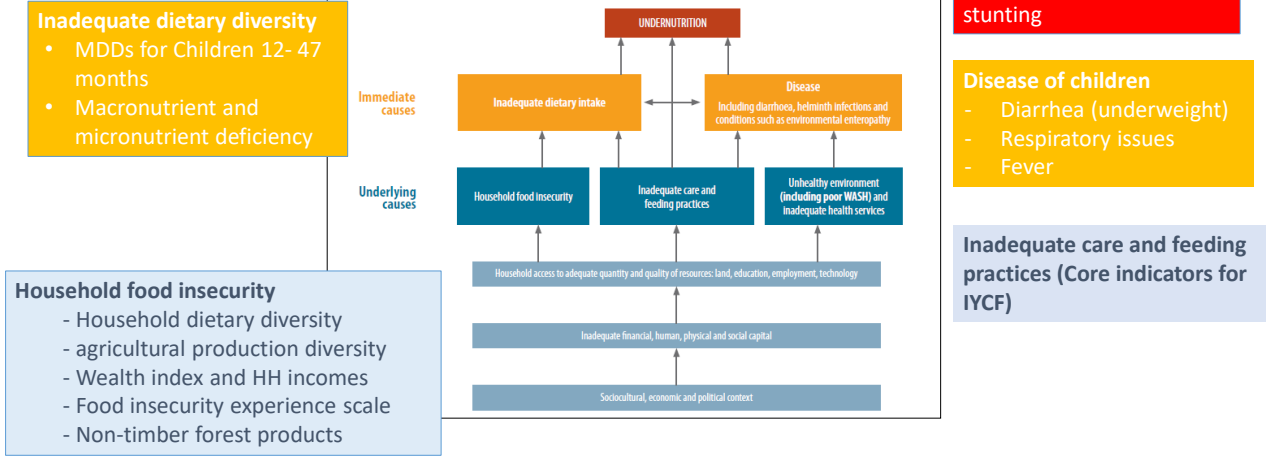
5

Methodology

➢ **An analytical cross-sectional survey** was conducted in Nong district, Savannakhet province

➢ **study population**: 23 villages, 173 households were selected and consisted of father, a mother and at least one child between 12 and 47 months of age

➢**Measurement variables**:

  ➢ Questionnaire: socio-economic status, HDDs, MDDs, Food Insecurity experience scale and IYCF

  ➢ Anthropometric measurement : wasting, underweight and stunting (WHO standard, WHO Anthro software)
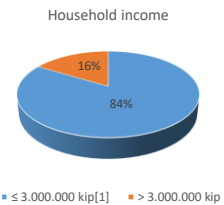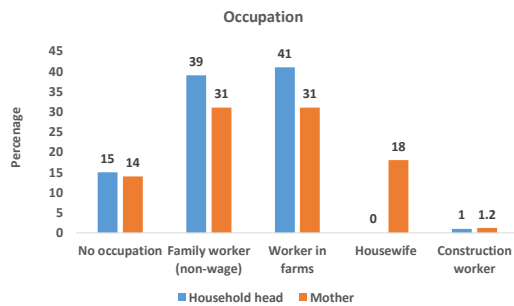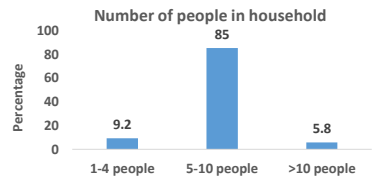
  ➢ 24 hour food intake recall

6

Conceptual framework of the causes of malnutrition

Fig. 3. Conceptual framework of the causes of undernutrition, including aspects of WASH and diarrhoea (adapted from UNICEF, 2013)

Inadequate dietary diversity
- MDDs for Children 12- 47 months
- Macronutrient and micronutrient deficiency

Household food insecurity
- Household dietary diversity
- agricultural production diversity
- Wealth index and HH incomes
- Food insecurity experience scale
- Non-timber forest products

Nutritional status
Underweight, wasting and stunting

Disease of children
- Diarrhea (underweight)
- Respiratory issues
- Fever

Inadequate care and feeding practices (Core indicators for IYCF)

Source: UNICEF 2013

Results: socio-economic characteristics
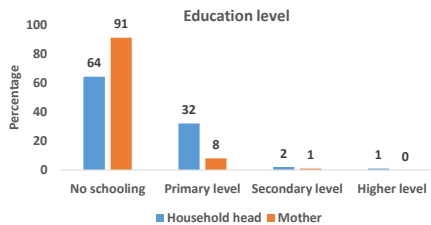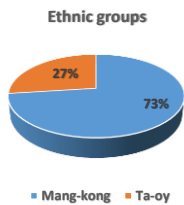
*1 UDS=9200 kips

Underlying causes: Household food insecurity

Agricultural production diversity

Percentage	
<3 types	17.9
3- <4 types	17.3
4- <5 types	24.3
≥ 5 Types	40.5

Harvesting non-timber forest products

2
42
56

■ < 3 NTFP   ■ 3-7 NTFP   ■ >7 NTFP
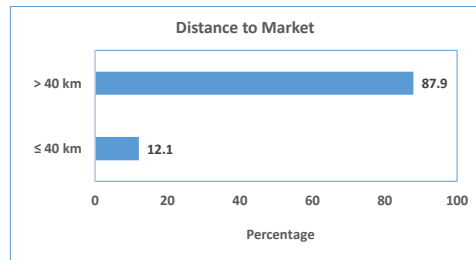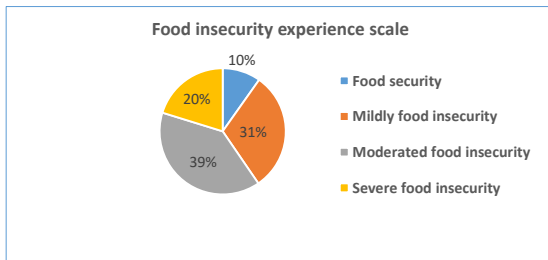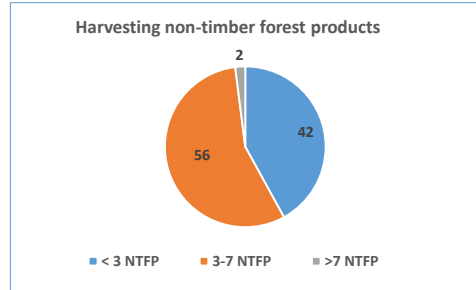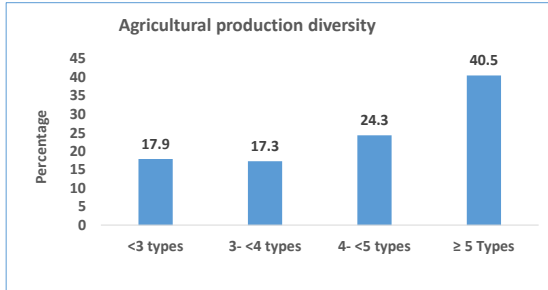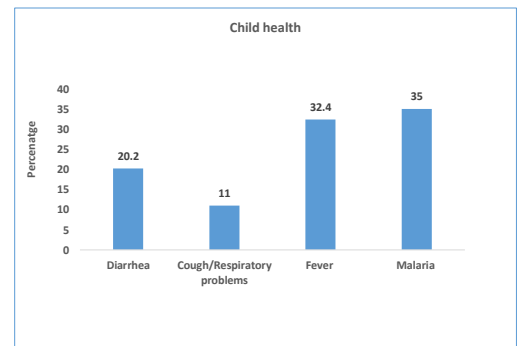
Food insecurity experience scale

10%
20%
31%
39%

■ Food security
■ Mildly food insecurity
■ Moderated food insecurity
■ Severe food insecurity

Distance to Market

> 40 km   87.9
≤ 40 km   12.1

Percentage

9

Underlying causes: care, feeding practice and child health

Variables for children (12-47 months)	N=173	
Male	84	48.6
Female	89	51.4
Core indicators for IYCF		
• Breastfeeding within 1hour of birth	160	92.5
• Exclusive breastfeeding children under 6 months	11	6
• Introduction of solid and semi-solid foods		
• < 7 Days after birth	55	32
• ≥ 1 week and < 1 month after birth	28	16
• ≥ 1 Month and < 6 months after birth	56	32
• Don't know	34	20
• Types of first supplementary feeds		
• Cow milk	1	0.6
• Infant formula	2	1.2
• Rice water	136	78.6
• Pre-chewed rice	27	15.6
• Don't know	3	1.7
• Minimum dietary diversity for children		
• Less than 4 food groups	92	53
• More than 4 food groups	81	47

Child health

Percenatge	
Diarrhea	20.2
Cough/Respiratory problems	11
Fever	32.4
Malaria	35

10

5

Nutrition status of children

Bar chart showing Percentage (y-axis, 0 to 80) for Wasting, Underweight, and Stunting.

- Wasting: World (2019) 7.3, Laos (2017) 9, Nong (2018) 18
- Underweight: Laos (2017) 27, Nong (2018) 53.3
- Stunting: World (2019) 21.9, Laos (2017) 33, Nong (2018) 72.8

Legend: ■ World (2019) ■ Laos (2017) ■ Nong (2018)

11

Comparison with WHO standard

Weight for Length/Height

Weight for Age

Length/Height for Age

WHO standards
Female (n=85)
Male (n=80)

12

6

Dietary nutrient intake adequacy

Table 3. Number (%) of children aged 12-47 months **who consumed the nutrients below** the 50%, 50~74.9%, 75~99.9% and over the 100% of the Thai DRI **(N=173)**

	Mean ±SD	DRI	Under 50%	50%~74.9%	75%~99.9%	Over 100%
Energy	723 ± 28.4	1000	52 (30.0%)	53 (30.6%)	30 (17.3%)	38 (21.9%)
Protein	23 ± 1.3	18	22 (12.7%)	40 (23.1%)	29 (16.8%)	82 (47.4%)
Calcium	136 ± 14.4	500	156 (90.1%)	8 (4.6%)	6 (3.5%)	3 (1.7%)
Iron	4.13 ± 0.2	5.8	82 (47.4%)	31 (17.9%)	14 (8.1%)	47 (27.2%)
Vitamin A	144 ± 24	400	108 (62.4%)	17 (9.8%)	20 (11.6%)	9 (5.2%)
Thiamin	0.3 ± 0.05	0.5	111 (64.2%)	26 (15.0%)	24 (13.9%)	12 (6.9%)
Riboflavin	0.4 ± 0.02	0.5	70 (40.5%)	33 (19.1%)	29 (16.8%)	41 (23.7%)
Vitamin C	16 ± 1.9	40	80 (46.2%)	19 (11.0%)	18 (10.4%)	16 (9.2%)
Niacin	6.7 ± 0.3	6	37 (21.4%)	44 (25.4%)	12 (6.9%)	80 (46.2%)

SD: standard deviation, DRI: dietary recommendation intake

13

Factors associated with malnourished children:
Table 4. Prevalence of wasting and its odds ratio.

Independent variables		Wasting (N=173)			OR (95% CI)	p-value
		Yes	No	Total		
Wealth Index	Poor	9	59	68	1	-
	Middle	2	33	35	0.397 (0.08-1.95)	0.255
	Rich	6	62	68	0.634 (0.21–1.89)	0.414
	Unknown			2		
Household assets	Radio	Yes 5	16	21	0.299 (0.09-0.95)	0.048*
		No 13	139	152		
	Mobile phone	Yes 6	83	89	2.3 (0.82-6.45)	0.13
		No 12	72	84		
	Rice mill	Yes 1	18	19	2.10 (0.26-16.8)	0.7
		No 16	137	153		
		Unknown		1		

14

Table 5. Prevalence of stunting and its odds ratio.

Independent variables			Stunting				
			Yes	No	Total	OR (95% CI)	p-value
Wealth Index	Poor		20	48	68	1	-
	Middle		6	29	35	2.014 (0.73–5.59)	0.18
	Rich		21	47	68	0.933 (0.45–1.94)	0.85
	Unknown				2		
Household assets	Radio	Yes	19	2	21	0.25 (0.05-1.12)	0.06
		No	107	45	152		
	Mobile phone	Yes	63	26	89	1.23 (0.63-2.42)	0.6
		No	63	21	84		
	Rice mill	Yes	10	9	19	2.72 (1.03-7.2)	0.038*
		No	115	38	153		
		Unknown			1		

15

Table 6. Prevalence of underweight and its odds ratio

Independent variables			Underweight			OR (95% CI)	p-value
			Yes	No	Total (N=173)		
Household assets	Radio	Yes	12	9	21	0.73 (0.29-1.84)	0.64
		No	75	77	152		
	Mobile phone	Yes	38	51	89	1.87 (1.02-3.43)	0.048*
		No	49	35	84		
	Rice mill	Yes	5	14	19	3.15 (1.08-9.17)	0.049*
		No	81	72	153		
		Unknown			1		
Non-timber forest products	< 3 types		42	29	71	1	
	3-7 types		43	53	96	0.56 (0.3-1.04)	0.067
	>7 types		0	4	4	0 (0)	0.99
	Unknown				2		
	gather insects	Yes	26	40	66	0.5 (0.27-0.94)	0.041*
		No	59	46	105		
		Unknown			2		
	gather ant eggs	Yes	2	9	11	0.2 (0.04-0.98)	0.031*
		No	83	77	160		
		Unknown			2		

16

Underweight (continued)

HDDS							
	4-6 Medium		40	39	79	1.30 (0.53-3.22)	0.56
	7-9 Good		32	28	60	1.45 (0.56-3.71)	0.43
	10-12 well		4	5	9	1.01 (0.22-4.72)	0.98
HDDS1	Cereal group	Yes	65	67	132	0.83 (0.42-1.69)	0.72
		No	22	19	41		
HDDS2	White roots and tubers group	Yes	63	45	108	2.39 (1.27-4.50)	0.008*
		No	24	41	65		

17

Discussion and recommendation

- child malnutrition in highland areas of Laos is a persistent and complex problem for public health
- The children's vulnerability to malnutrition resulted from lack of adequate nutrient intake, low dietary diversity, and infectious diseases
- Nutritional interventions should include both **nutrition-specific** as well as nutrition-sensitive interventions
- Vitamin A supplementation should continue and calcium insufficiencies can be addressed by improving the supply chain to include milk and/or small fish with edible bones.
- In addition to nutrition-specific interventions, water, sanitation and hygiene programs and strengthening primary health care are critical to manage the frequent episodes of fever and diarrhoea, which affect nutrient uptake. Nutrition education should also be established more firmly within healthcare.

18

Thanks for your attention

Q & A

19