Assessment of Household Food Security through Crop Diversification in Natmauk Township, Magway Region, Myanmar

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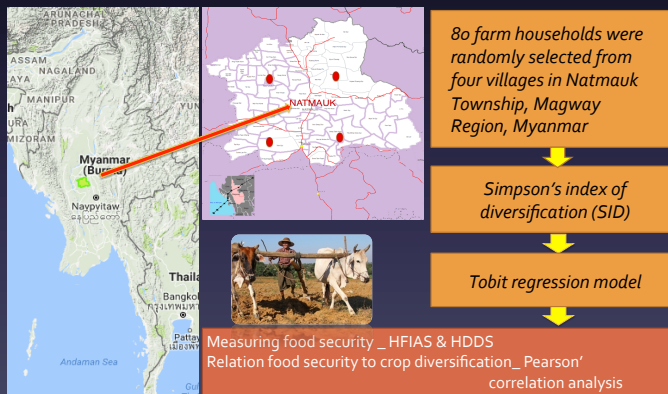*Affilliation: Department of Agricultural Economics, Faculty of Bioscience Engineering, Ghent University, Belgium*
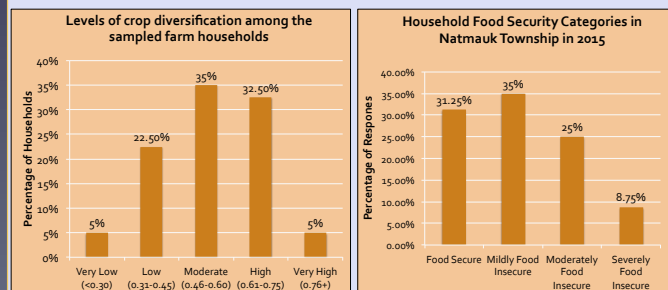
Background

❖ Myanmar is an agriculture based society and variety of crops produced all year round
❖ Food security comprises four key dimensions: availability of food, access to food, and utilization of food and stability of food
❖ In term of supply Myanmar is food secure : producing 2571 kcal per in 2013
❖ Diversification of crops generates income for farm' households, creates their employment, and achieves self-sufficiency of foods at farm level
❖ Decision of the farmers on crop diversification is the important economic decision and has a strong impact on farmer's income level & food security of the households
❖ Many determining factors on crop diversification such as demographic, socioeconomic, biophysical & institutional characteristics

Objectives

• To study the socioeconomic characteristics and crop diversification (indexes) of sampled farm households in the study area
• To analyze the factors determining crop diversification
• To investigate the food security status of the sampled farm households in relation to crop diversification

80 farm households were randomly selected from four villages in Natmauk Township, Magway Region, Myanmar

Simpson's index of diversification (SID)

Tobit regression model

Measuring food security _ HFIAS & HDDS
Relation food security to crop diversification_ Pearson' correlation analysis

Results and Discussion

Levels of crop diversification among the sampled farm households

- Very Low (<0.30): 5%
- Low (0.31-0.45): 22.50%
- Moderate (0.46-0.60): 35%
- High (0.61-0.75): 32.50%
- Very High (0.76+): 5%

Household Food Security Categories in Natmauk Township in 2015

- Food Secure: 31.25%
- Mildly Food Insecure: 35%
- Moderately Food Insecure: 25%
- Severely Food Insecure: 8.75%

Results and Discussion

➢ Main income sources
Crop production (58.75 %)
Livestock production (10.19 %)
Others (trading, salary, remittances, casual labor, pensions, assistances, etc)

➢ Common crops
Oil seed crops (Sesame- 93.8%)
Cereals (Rice 65%, Sorghum 77.5%)
Pulses (green gram 61.3 %)
Vegetables (42.5 %)

➢ We observe a negative correlation between crop diversification levels and food insecurity status (Pearson' correlation -0.583) among the sampled farm households in the study area
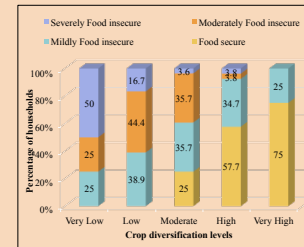
Results and Discussion

➢ About half of the household ate 4-5 food groups and they were belonged to the medium dietary diversity group

➢ Less diversified crops production were found in medium and low dietary diversity groups
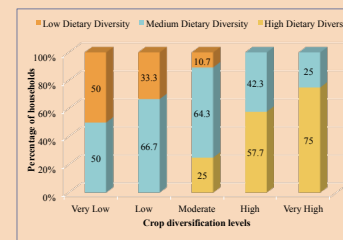
➢ The results show a clear link between household food dietary diversity and crop diversification (Pearson' correlation=0.589)
➢ Crop diversification is positively associated with greater dietary diversity of the farm households in the study area

Results and Discussion

➢ The value of crop diversification indexes (Simpson Index of Diversification) are categorized as : Very Low = < 0.30, Low = 0.30 to 0.40, Moderate = 0.40 to 0.50, High = 0.50 to 0.60, Very High = > 0.60
➢ On average, households moderately diversified their crops in their cropping patterns (mean CDI = 0.54).
➢ The HFIAS score is negatively correlated with crop diversification and HDDS.

	CDI	HFIAS	HDDS
CDI	1	-0.680**	0.637**
HFIAS	-0.680**	1	-0.800**
HDDS	0.637**	-0.800**	1

➢ The Tobit Regression (censored model) is specified as:

$$y_i^* = \beta x_i + \mu_i \,, \mu_i \sim N(0, \sigma^2)$$

$$y_i = \begin{cases} 0 & if \ y_i^* \leq 0 \\ y^* & if \ 0 < y_i^* < 1 \\ 1 & if \ y_i^* > 1 \end{cases}$$

➢ y_i^* = is a latent variable (representing diversification index), β is a relationship parameter between independent variables and latent variable (independent variables in Table), x_i is a vector of explanatory variables, μ_i is a normal error term

Variables	Coefficients	Std. Error	T-value
Constant	0.361***	0.061	5.928
Age (years)	-0.002**	0.001	-2.507
Gender (Male = 1)	0.028	0.021	1.318
Education Level	0.024**	0.012	1.962
Experiences (years)	0.002**	0.001	2.260
Household size (persons)	0.005	0.007	0.730
Farm size (acres)	0.011***	0.003	3.544
Extension contact (number)	0.014	0.009	1.586
Non-farm income	-0.040*	0.021	-1.944
Distance to market (km)	-0.011*	0.005	-1.911
Access to credit (Yes = 1)	0.041*	0.022	1.887
Access to irrigation (Yes = 1)	0.057***	0.020	2.865
LogSigma	-2.760***		
Log-likelihood	107.339		

Empirical Findings

❖ The study further revealed that farming experience, education level of household heads, farm size, access to irrigation and access to credit were positively and significantly affected to crop diversification
❖ Age of household heads, non-farm/off-farm income and distance to market were negatively and significantly affected crop diversification
❖ Food security is associated with crop diversification in the study area and farmers should be stimulated to more diversify the different crops in their cropping pattern

Conclusion

✓ **Crop production** – main income source for about 60 % of households
✓ Better household food security associated with crop diversification and thus encourage right selection & cultivation of different crop types in their farming system
✓ **Access to irrigation** – necessary for proper management, and well maintenance as well as intervene and encourage water saving practices, e.g rainwater harvesting
✓ **Extension contacts** - promoting crop diversification - selection of more profitable, drought resistant and suitable crops
✓ **Market accessibility** – promote development of road and market infrastructures
✓ **Further studies** - food security indicators, comparison among different land holding size, benefit- cost analysis, large sample size