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Effects of Livelihood capitals on poverty of forest dependent households in upland area: A casestudy in BacKan province, Vietnam

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1. Introduction

- **Forest has been a key component of rural livelihood. They are important both socially and economically**
- **The level of reliance on forest environmental products differs between households. Reliance reflects different livelihood strategies determined by household capitals**
- **BacKan is a mountainous province that has the largest forest cover in Vietnam**
- **→ Objective: to assess the situation of livelihood capitals as well as their impacts to the poverty status of forest-dependent households in upland areas of Bac Kạn province**

2. Methodology

- Study site: The district of Ba Be and Na Ri
  - Ba Be: Hoang Tri and Dong Phuc commune
  - Na Ri: Lang San and Van Hoc commune
- Sampling:
  - Surveyed hamlets: Hamlets in upland areas
  - Selected HHs: all HHs in the hamlets
- Sample size: 218 HHs (directed interview)
- Data analysis
  - Descriptive statistic (mean, standard deviation) to describe livelihood capitals, poverty
  - Logit regression (binary) model and T-test to test the effect of livelihood platform on poverty status

2. Methodology (cont…)

- Dependent Variable: poverty status
  - Type: binary (1 = poor HHs; 0 = noon poor HHs)
  - Poor HHs is a HH has poor certificate of Vietnamese Government.
- Independent Variables: HHs livelihood capitals
  - Human capital
  - Financial capital
  - Social capital
  - Natural capital
  - Physical capital

Definition of Livelihood platform

Variable	Definition
Vulne	Vulnerability (1 = yes; 0 = no)
LS	Livelihood strategy is classified from the level of forest dependence (1=low, 2=medium, 3=high)
Human capital	
nolabor	Number of labors in HHs (in log)
hhedu	Education of HH head (dummy)
hhage	age of HH head in year (in log)
training	Whether the HH participates training class (1= yes; 0=no)
Financial capital	
saving	Whether the HH has savings (1 = yes; 0 = no)
incomesour	Number of the HH income sources (1 = the HH has more than three income sources, 0 = otherwise)
loan	Whether the HH is in dept (1 = yes; 0 = no)
stableincome	Whether the HH has stable income labor (1 = yes; 0 = no)

Definition of Livelihood capitals

Variable	Definition
Social capital	
invtraining	Whether the HH get invitaion to paticipate training class (1 = yes; 0 = no)
forestpatrol	Whether the HH members of a forest patrol (1=yes; 0=no)
local union	Whether th HH often participates the local Unions (1 = yes; 0 = no)
trust	Whether the HH trust their naighbors (1 = yes; 0 = no)
Natural capital	
agriland	Agriculture land area of HH (in hecta) (in log)
forestland	Forestland area of HH (in hecta) (in log)
water	whether the HH access clean water (1 = yes; 0 = no)
forestacces	Whether the HH access to forest easily (1 = yes; 0 = no)
Physical capital	
house	Housing quality (1) good; (2) normal; (3) bad
houseasset	Housing assets (in log)
proasset	Assets for production and business purpose (in log)

3. Results and discussion

Summary statistics for income by poverty status

Unit: thousand VND

		No. HHs	Agriculture	Livestock	Forest	Off-farm	Others	Total
Total sample	Mean	218	10,479.94	5,386.34	7,015.81	11,329.39	1,251.28	35,462.78
	SD		7,141.86	7,364.83	5,957.79	27,144.89	5,765.40	38,172.38
Non poor HHs	Mean	148	11,990.12	6,476.02	7,857.80	14,868.65	1,779.34	42,971.92
	SD		7,744.99	8,169.35	6,516.54	31,842.04	6,928.34	43,684.73
Poor HHs	Mean	70	7,287.00	3,082.47	5,235.61	3,846.40	134.83	19,586.31
	SD		4,169.22	4,524.35	4,052.74	8,577.21	639.96	11,844.05
Difference of two means*	Mean	-	4,703.12	3,393.55	2,622.19	11,022.25	1,644.51	23,385.61
	SE	-	808.47	862.18	722.20	2,811.01	574.62	3,859.83
	P value	-	0.0000	0.0001	0.0002	0.0001	0.0024	0.0000

Notes: no = number; HHs = households; SD = standard deviation; SE = standard Errors; 1 million VND = 44.51 US dollars.

H0 = no difference in mean income between the poor and the non poor,

Ha = the non poor HHs income is higher than the poor HHs income.

Summary statistics for livelihood platform variables by poverty status

Variable[a]		Total sample		Poor HHs		Non-poor HHs		**Difference of two means**	
		Mean	SD	Mean	SD	Mean	SD	Difference	P-value
Vulne		0.321	0.468	0.214	0.413	0.372	0.485	-0.157***	0.007
LS[b]		2.170	0.811	2.014	0.789	2.243	0.813	-0.229**	0.025
Human capital	nolabor	3.202	1.201	2.786	1.034	3.399	1.227	-0.613***	0.000
	hhedu[b]	2.821	0.853	2.557	0.810	2.946	0.847	-0.389***	0.001
	hhage	45.037	10.073	42.300	10.387	46.331	9.690	-4.031***	0.004
	training[b]	0.748	0.435	0.671	0.473	0.784	0.413	-0.112**	0.046
Financial capital	saving[b]	0.128	0.335	0.014	0.120	0.182	0.388	-0.168***	0.000
	incomesour[b]	0.578	0.495	0.457	0.502	0.635	0.483	-0.178***	0.007
	loan[b]	0.775	0.418	0.814	0.392	0.757	0.430	0.058	0.164
	stableincome[b]	0.307	0.462	0.086	0.282	0.412	0.494	-0.326***	0.000

[b] *dummy variables*

***, **, and * are significance at the 1%, 5% , and 10% levels, respectively.

Summary statistics for livelihood platform variables by poverty status

Variable[a]		Total sample		Poor HHs		Non-poor HHs		**Difference of two means**	
		Mean	SD	Mean	SD	Mean	SD	Difference	P-value
Social capital	invtraining[b]	2.257	0.836	2.100	0.854	2.331	0.820	-0.231**	0.031
	forestpatrol[b]	0.440	0.498	0.343	0.478	0.486	0.502	-0.144**	0.022
	local union[b]	0.151	0.359	0.143	0.352	0.155	0.364	-0.013	0.404
	trust[b]	0.872	0.335	0.871	0.337	0.872	0.336	0.000	0.498
Natural capital	agriland	0.543	0.287	0.401	0.192	0.611	0.300	-0.209***	0.000
	forestland	3.656	7.517	2.536	7.096	4.186	7.674	-1.650*	0.060
	water[b]	0.638	0.482	0.586	0.496	0.662	0.475	-0.076	0.142
	forestacces[b]	0.450	0.499	0.429	0.498	0.459	0.500	-0.031	0.335
Physical capital	house[b]	2.101	0.507	1.843	0.528	2.223	0.449	-0.380***	0.000
	houseasset	32.940	22.947	18.514	8.404	39.764	24.458	-21.249***	0.000
	proasset	18.128	10.730	12.129	6.633	20.966	11.138	-8.838***	0.000

[b] *dummy variables*

***, **, and * are significance at the 1%, 5% , and 10% levels, respectively.

Logit estimates and test statistics for poverty status model

poverty		Logit model			Marginal effect	
		Coef.	Robust Std. Err.	P>z	dy/dx	P>z
1.saving [a]		5.726***	1.322	0.000	0.158***	0.000
1.loan [a]		-1.872***	0.691	0.007	-0.100***	0.001
1.incomesour [a]		-0.569	0.569	0.317	-0.042	0.279
1.stableincome [a]		2.427***	0.902	0.007	0.143***	0.000
nolabor		-1.170	0.721	0.104	-0.089	0.102
hhedu [d]	1	-3.738**	1.607	0.020	-0.266	0.201
	2	-3.558***	1.020	0.000	-0.232***	0.000
	3	-2.512***	0.885	0.005	-0.091**	0.030
hhage		5.262***	1.818	0.004	0.400***	0.004
1.training [a]		0.875	0.685	0.202	0.080	0.229
agriland		2.060***	0.671	0.002	0.156***	0.003
forestland		-0.112	0.192	0.560	-0.009	0.572
1.forestacess [a]		-0.421	0.502	0.402	-0.033	0.443
1.water [a]		0.924	0.707	0.191	0.079	0.209
house [c]	1	-2.637**	1.189	0.027	-0.242	0.273
	2	-1.393**	0.567	0.014	-0.070**	0.023
houseasset		2.410***	0.723	0.001	0.183***	0.002
proasset		0.727	0.528	0.168	0.055	0.183
invtraining [b]	2	0.949	0.729	0.193	0.051	0.177
	3	-0.351	0.649	0.588	-0.032	0.578
1.forestpatrol [a]		1.006	0.718	0.161	0.074	0.155
1.localunion [a]		2.120***	0.748	0.005	0.096***	0.002

Note:
Log pseudolikelihood = -63.0483;
Number of obs = 218;
Wald chi2(17) = 50.27;
Prob > chi^2 = 0.0008;
Pseudo R^2 = 5392;
[a, b, c, d] the reference category is 0, 1, 3, 4 respectively;
***, **, and * are significance at the 1%, 5% , and 10% levels, respectively.

Classification of poverty status model

Poverty status		Real poverty status		
		Poor	Non-poor	Total
Model estimation	Poor	53	11	64
	Non-poor	17	137	154
	Total	70	148	218
% correct estimation		75.71	92.57	87.16

4. Conclusion

- **The poor rate of forest-dependent households is still high;**
- **The households livelihood capital is still weak;**
- **The stronger livelihood capitals households seem to be non-poor.**
- **The effect of livelihood capitals to household's poverty status is significant. In which, human and financial capitals have the most impact.**
- **The estimated logit model is highly confident with 87.16% of correct estimation.**
- **In poverty reduction program, the State should improve the livelihood capitals, especially human and financial capitals for the households.**

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