Impact of new rural planning on livelihood assets in Tho Xuan, Thanh Hoa province: an empirical analysis using the sustainable livelihood framework

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Tác động của quy hoạch xây dựng nông thôn mới đến nguồn vốn sinh kế tại Thọ Xuân, tỉnh Thanh Hóa: phân tích thực tiễn dưới góc nhìn của khung sinh kế bền vững

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ABSTRACT

This study evaluates the impact of the New Rural Planning (NRP) on household livelihood assets and propose context-specific strategies for sustainable livelihood development in Tho Xuan, Thanh Hoa province. Based on the Sustainable Livelihood Framework (SLF), a proportional random sampling method was used to survey 450 households across three selected communes. Primary data were collected through face-to-face interviews and supplemented with secondary sources. Data were analyzed using Analysis of Variance (ANOVA), Tukey's post-hoc test, and Spearman's rank correlation coefficients. The study examines the effects of four planning components - spatial planning (SP), land use planning (LUP), production planning (PP), and construction planning (CP) - on livelihood assets across three regions. The results show that SP has the strongest positive correlation with crop production livelihood asset in Region 3. LUP is the most influential factor with livestock livelihood asset in Region 1; and services asset in Region 3. PP has the greatest positive impact on livelihood assets in Regions 1 and 2. CP has the greatest impact on crop production asset in Region 1. The findings offer important implications for policymakers in designing effective and context-responsive strategies for sustainable livelihood development.

Từ khóa:
Khung sinh kế bền vững, nguồn vốn sinh kế, quy hoạch xây dựng nông thôn mới, Thọ Xuân.

TÓM TẮT

Nghiên cứu nhằm đánh giá tác động của Quy hoạch xây dựng nông thôn mới (NRP) đến nguồn vốn sinh kế của hộ gia đình và đề xuất các giải pháp phát triển sinh kế bền vững tại Thọ Xuân, tỉnh Thanh Hoá. Dựa trên Khung sinh kế bền vững (SLF), phương pháp chọn mẫu ngẫu nhiên theo tỷ lệ được áp dụng để khảo sát 450 hộ thuộc ba xã nghiên cứu. Số liệu sơ cấp được thu thập thông qua phỏng vấn trực tiếp, kết hợp với số liệu thứ cấp. Phân tích số liệu sử dụng các phương pháp: phân tích phương sai (ANOVA), kiểm định hậu nghiệm Tukey, và hệ số tương quan thứ hạng Spearman. Nghiên cứu đánh giá tác động của quy hoạch sản xuất, quy hoạch không gian, quy hoạch sử dụng đất, và quy hoạch xây dựng đến các nguồn vốn sinh kế tại ba vùng đại diện. Kết quả cho thấy quy hoạch không gian tỷ lệ thuận cao nhất với nguồn vốn sinh kế trồng trọt tại vùng 3. Quy hoạch sử dụng đất tỷ lệ thuận cao nhất với nguồn vốn sinh kế chăn nuôi tại vùng 1; dịch vụ tại vùng 3. Quy hoạch sản xuất có tác động thuận lớn nhất đến nguồn vốn sinh kế tại vùng 1 và 2. Quy hoạch xây dựng có tác động lớn nhất đến nguồn vốn sinh kế trồng trọt tại vùng 1. Kết quả nghiên cứu là cơ sở tham khảo cho các nhà hoạch định chính sách trong việc đề xuất các giải pháp phát triển sinh kế bền vững theo hướng hiệu quả và phù hợp.

1. INTRODUCTION

Rural development plays a vital role in poverty reduction and sustainable livelihood improvement [1, 2] (Ashley and Maxwell, 2001; International Fund for Agricultural Development, 2016). In Vietnam, the New Rural Development (NRD) program has contributed to agricultural modernization, income growth, and improved living conditions [3-5]. It facilitates economic restructuring by shifting from subsistence farming to diversified, market-oriented livelihoods, reshaping landscapes and livelihood strategies at various levels [5-7]. However, uneven implementation and limited focus on sustainable livelihoods remain key challenges [8]. Access to livelihood assets, including natural, social, physical, financial, and human capital [9, 10], is crucial for shaping livelihood strategies and outcomes [11-19]. The SLF has been widely applied in rural development, poverty reduction, resource management, and climate adaptation. As farmers shift to market-oriented production, capital demands rise significantly [20]. Ensuring access to diverse livelihood assets is crucial for achieving sustainable livelihoods amid ongoing socio-environmental changes [10, 21, 22].

New Rural Planning (NRP), a core component of NRD [23], includes spatial planning (SP), land use planning (LUP), production planning (PP), and construction planning (CP) [24]. The NRP plays a key role, providing the foundation for achieving the other criteria in the NRD [25, 26]. In Tho Xuan, the NRD has altered land use patterns and local livelihoods, replacing traditional, small-scale practices with new agricultural and service-based livelihoods [27]. Despite the growing body of research on rural development and livelihood transformation, limited empirical studies have examined how different NRP components affect livelihood assets across regions with diverse socio-economic conditions. In particular, the differentiated impacts of planning components on specific types of livelihood capital remain insufficiently explored. This study aims to (i) investigate the impact of NRP on livelihood assets across regions and (ii) propose strategies for sustainable livelihood development in Tho Xuan, Thanh Hoa province.

2. RESEARCH METHODS

Study Area: The study was conducted in Tho Xuan, Thanh Hoa province, covering 29,229.4 ha with a population of approximately 220,625. After the administrative reorganization under Resolution No. 1686/NQ-UBTVQH15 dated June 16, 2025 of the National Assembly Standing Committee, the area currently consists of eight communes: Tho Xuan, Tho Long, Xuan Hoa, Sao Vang, Lam Son, Tho Lap, Xuan Tin, and Xuan Lap. By 2021, the area had achieved 10 of 26 targets and 5 of 9 criteria for advanced new rural status [27]. To capture socio-economic variation, three representative communes were selected: (i) Region 1: Tho Xuong commune, including 9 administrative units (12,874.4 ha; 70,480 people), (ii) Region 2: Tho Hai commune, including 11 units (6,330.9 ha; 60,814 people), and (iii) Region 3: Xuan Lap commune, including 10 units (10,024.1 ha; 65,843 people). The classification into three regions was based on differences in socio-economic conditions, infrastructure development, and dominant livelihood activities. Region 1 represents a more developed area with better infrastructure and market access; Region 2 reflects intermediate conditions; while Region 3 is less developed, characterized by limited infrastructure and lower income levels.

Analytical Framework: The study applies the SLF [9] to evaluate five livelihood assets: (i) natural asset (N) includes land and water resources used for production; (ii) social asset (S) reflects participation in networks, groups, and institutions that facilitate access to resources and information; (iii) financial asset (F) refers to accessible financial resources supporting livelihood activities; (iv) physical asset (P) involves infrastructure, equipment, and production activities; and (v) human asset (H) includes demographic and socio-economic characteristics such as education, experience, and labor availability. These assets collectively determine household livelihood strategies and outcomes (Figure 1).

Data Collection: Primary data were collected from 450 households (150 households per commune) using structures questionaries and proportional random sampling. Secondary data

were obtained from local authorities. The sample size was determined using Yamane's formula [28]:

$$n = \frac{N}{1+N*e^2}$$

where,

n is the sample size;

N is the total number of households (5,977);

and e is the acceptable sampling error (e=0.05).

Variables: The independent variables include four NRP components: spatial planning (SP), land-use planning (LUP), production planning (PP), and construction planning (CP). Each component was evaluated through criteria including planning project, planning publicity, capital mobilization, planning management, priority projects implementation. The dependent variable includes livelihood assets across five domains: crop production, livestock, aquaculture, craft villages, and services; each assessed through five asset types (Figure 1).

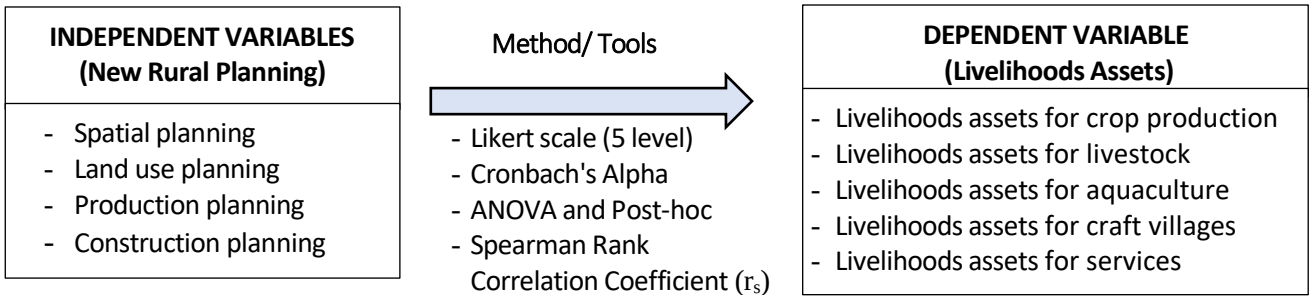

Figure 1. Conceptual framework of the study

Data Analysis: A 5-point Likert scale (1 = very poor, 5 = very good) was used to measure the dependent and independent variable, and perceptions of NRP impacts [29] (Likert, 1932). The mean value represents the average perception score of respondents for each indicator. Higher mean values indicate better performance or stronger perceived impact. The classification of mean values is as follows: ≥4.2 (excellent), 3.4–<4.2 (good), 2.6–<3.4 (average), 1.8–<2.6 (poor), and <1.8 (very poor). Reliability was tested using Cronbach's Alpha. ANOVA and Tukey's tests examined regional differences, while Spearman's rank correlation (r_s) assessed relationships between NRP components and livelihood assets at a 0.05 significance level. Correlation strength was classified as low (< 0.25), moderate (0.25–<0.50), high (0.50–<0.75), very high (≥0.75). Using SPSS for data analysis.

3. RESULTS AND DISCUSSION

3.1. Implementation outcomes of NRP

Overall, the implementation of NRP across the study area was rated at a good level (mean scores ranging from 3.15 to 3.82 across components; Table 1). Among the four components, SP and LUP showed more consistent and higher performance (3.59 and 3.79, respectively), while PP and CP were rated lower and exhibited greater variability (3.15 and 3.57). Across all components, planning publicity and priority project implementation received the highest scores (3.75–4.28), indicating effective dissemination and execution of planning activities. In contrast, capital mobilization and planning management were consistently rated lower (2.50–3.42), reflecting persistent constraints in financial resources and governance capacity.

Regional disparities were evident but relatively moderate. Region 1 generally achieved slightly higher scores across most indicators (LUP=3.82; CP=3.69), benefiting from stronger infrastructure and investment attraction, whereas Region 3 showed lower performance, particularly in capital mobilization (SP=2.75; PP=2.46; CP=2.42). However, most differences between regions were not statistically significant, except for some indicators about capital mobilization and planning management ($p<0.05$), suggesting that while overall implementation patterns are similar, financial constraints and management remain key differentiating factors.

These findings indicate that although NRP has been implemented relatively uniformly across regions, its effectiveness is still closely associated with local socio-economic conditions, particularly access to financial resources and institutional capacity.

Table 1. Assessment of the implementation of New Rural Planning

Dimensions of NRP		Assessment criteria					
		Planning project	Planning publicity	Capital mobilization	Planning management	Priority projects Implementation	Overall
1. Spatial planning							
Region 1		3.42	4.21	3.56	3.21	3.95	3.67
Region 2		3.51	4.37	3.07	3.09	3.88	3.58
Region 3		3.67	4.27	2.75	3.10	3.83	3.52
Mean		3.53	4.28	3.13	3.14	3.89	3.59
p-value							
Region 1	Region 2	0.752	0.187	0.001	0.650	0.735	0.526
	Region 3	0.069	0.829	0.000	0.650	0.400	0.147
Region 2	Region 3	0.291	0.473	0.037	1.000	0.849	0.707
2. Land use planning							
Region 1		3.68	4.27	3.51	3.81	3.81	3.82
Region 2		3.85	4.23	3.44	3.71	3.83	3.81
Region 3		3.81	4.24	3.31	3.79	3.61	3.75
Mean		3.78	4.25	3.42	3.77	3.75	3.79
p-value							
Region 1	Region 2	0.197	0.919	0.851	0.500	0.979	0.997
	Region 3	0.360	0.947	0.260	0.976	0.122	0.683
Region 2	Region 3	0.931	0.997	0.559	0.633	0.079	0.727
3. Production planning							
Region 1		3.33	3.82	2.83	2.51	3.52	3.21
Region 2		3.19	3.87	2.74	2.52	3.58	3.18
Region 3		3.21	3.72	2.46	2.47	3.56	3.08
Mean		3.24	3.80	2.68	2.50	3.55	3.15
p-value							
Region 1	Region 2	0.389	0.938	0.621	0.990	0.816	0.936
	Region 3	0.461	0.669	0.001	0.917	0.914	0.193
Region 2	Region 3	0.991	0.455	0.015	0.857	0.978	0.348
4. Construction planning							
Region 1		3.86	4.27	2.66	3.36	4.30	3.69
Region 2		3.71	4.26	2.53	2.78	4.21	3.50
Region 3		3.71	4.25	2.42	2.95	4.25	3.52
Mean		3.76	4.26	2.54	3.03	4.26	3.57
p-value							
Region 1	Region 2	0.299	0.997	0.376	0.000	0.680	0.013
	Region 3	0.332	0.972	0.044	0.002	0.894	0.029
Region 2	Region 3	0.998	0.988	0.534	0.347	0.921	0.959

Note: p-value <0.05: statistically significant difference between subjects.

3.2. Main livelihoods and their capital

Recognizing agricultural restructuring as a key component of NRP, Tho Xuan has prioritized agricultural and rural production through the application of science and technology. Overall, livelihood assets were rated from moderate to good across regions and livelihood types (3.29–4.38; Table 2), with clear variation by activity. Craft village and service activities achieved the highest scores (4.21 and 4.03), reflecting strong local engagement and the expansion of non-farm opportunities, while crop, livestock, and aquaculture production showed moderate performance.

Across all livelihood types, human capital consistently ranked highest (3.76–4.38), highlighting the important role of skills, knowledge, and labor availability in sustaining rural livelihoods. In contrast, financial capital remained the main constraint (3.29–3.53), particularly in livestock and aquaculture activities, which require higher initial investment. Limited access to credit, low saving capacity, and high production costs reduce households' ability

to expand and diversify livelihood strategies.

Regional differences were also evident. Region 1 generally performed better, especially in service and craft village activities (service=4.23; craft village=4.36), supported by better infrastructure and urbanization. Region 2 showed advantages in aquaculture (3.77), reflecting favorable natural conditions and targeted investments. In contrast, Region 3 recorded lower scores in several activities, particularly livestock and aquaculture (3.19-3.26), due to weaker natural and financial capital.

These findings suggest that while NRP has supported the diversification of livelihoods, the effectiveness of different livelihood models depends strongly on local resource endowments and access to financial capital.

Table 2. Assessment of sustainable livelihood capital

Assessment criteria	Crop production		Livestock		Aquaculture		Craft village		Service	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Overall										
Region 1	3.91	0.872	3.75	0.749	3.29	0.757	4.36	0.652	4.23	0.767
Region 2	3.85	0.614	3.77	0.662	3.77	0.667	3.99	0.563	3.94	0.668
Region 3	3.71	0.675	3.28	0.559	3.26	0.548	4.28	0.527	3.93	0.576
Total Area	3.82	0.732	3.60	0.697	3.44	0.702	4.21	0.604	4.03	0.688
Natural capital										
Region 1	3.99	0.909	3.38	0.939	2.91	0.972	4.22	0.874	4.21	0.879
Region 2	4.09	0.763	3.53	0.841	3.54	0.841	3.99	0.675	4.09	0.763
Region 3	4.17	0.801	3.03	0.802	2.94	0.762	4.21	0.745	4.17	0.801
Total Area	4.09	0.828	3.31	0.886	3.13	0.908	4.14	0.775	4.16	0.815
Social capital										
Region 1	3.78	1.092	3.86	0.883	3.23	0.839	4.32	0.780	4.15	0.951
Region 2	3.63	0.848	3.97	0.785	3.98	0.790	3.84	0.715	3.78	0.904
Region 3	3.44	0.908	3.32	0.617	3.31	0.615	4.28	0.667	3.79	0.738
Total Area	3.62	0.963	3.72	0.819	3.51	0.823	4.15	0.753	3.90	0.884
Financial capital										
Region 1	3.71	1.083	3.61	1.111	3.29	0.965	4.29	0.780	4.13	0.946
Region 2	3.55	0.773	3.39	1.015	3.39	1.016	3.77	0.706	3.70	0.857
Region 3	3.32	0.854	3.19	0.893	3.19	0.893	4.23	0.595	3.68	0.708
Total Area	3.53	0.925	3.39	1.022	3.29	0.961	4.10	0.734	3.84	0.867
Physical capital										
Region 1	3.79	1.109	3.87	0.880	3.27	0.864	4.48	0.792	4.22	0.919
Region 2	3.74	0.839	3.97	0.789	3.96	0.785	4.10	0.784	3.89	0.876
Region 3	3.36	0.971	3.33	0.773	3.32	0.771	4.30	0.683	3.75	0.761
Total Area	3.63	0.996	3.72	0.861	3.52	0.866	4.29	0.769	3.95	0.875
Human capital										
Region 1	4.26	0.915	4.03	0.941	3.78	0.881	4.51	0.730	4.43	0.806
Region 2	4.21	0.747	3.98	1.006	3.99	1.010	4.24	0.748	4.25	0.759
Region 3	4.25	0.874	3.53	0.953	3.52	0.939	4.38	0.757	4.25	0.868
Total Area	4.24	0.847	3.85	0.990	3.76	0.962	4.38	0.752	4.31	0.815

3.3. Impact of implementing NRP on livelihood assets

The impact of NRP on livelihood assets varies across regions and livelihood types, with all four planning components showing statistically significant correlations at different levels (rs ≈ 0.07-0.66; Tables 3-7). Overall, PP and CP emerge as the most influential components, particularly in crop production and service activities, where they strongly enhance financial and physical capital. In contrast, SP and LUP play more context-specific roles, with stronger effects observed in regions where infrastructure and land resources are key constraints.

Across all livelihood types, human capital consistently shows strong associations with

planning components, underscoring the critical role of skills, education, and labor capacity in sustaining and adapting rural livelihoods. Overall, these findings highlight that the effectiveness of NRP is highly context-dependent, requiring planning strategies that are aligned with local resource endowments, infrastructure conditions, and development levels.

3.3.1. Crop production

The findings in Table 3 highlight that the planning components do not exert equal influence on livelihood assets, nor do they demonstrate consistent performance across regions.

Table 3. Impact of NRP on livelihood capitals for crop production

New rural planning	Overall	Natural capital	Social capital	Financial capital	Physical capital	Human capital
Region 1						
Spatial planning	0.460**	0.420**	0.376**	0.413**	0.376**	0.344**
Land use planning	0.467**	0.593**	0.322**	0.372**	0.323**	0.402**
Production planning	0.653**	0.534**	0.586**	0.605**	0.576**	0.446**
Construction planning	0.662**	0.512**	0.572**	0.605**	0.585**	0.544**
Region 2						
Spatial planning	0.481**	0.330**	0.306**	0.405**	0.356**	0.422**
Land use planning	0.479**	0.426**	0.275**	0.374**	0.326**	0.421**
Production Planning	0.633**	0.339**	0.585**	0.535**	0.564**	0.380**
Construction planning	0.348**	0.301**	0.167*	0.260**	0.217**	0.395**
Region 3						
Spatial planning	0.512**	0.451**	0.367**	0.332**	0.363**	0.301**
Land use planning	0.429**	0.596**	0.193*	0.154	0.184*	0.422**
Production planning	0.367*	0.154	0.321**	0.290**	0.325**	0.193*
Construction planning	0.524**	0.363**	0.395**	0.363**	0.379**	0.377**

*** indicates significance at 0.01; * at 0.05; N = 450.*

In region 1, PP and CP have the strongest influence on overall livelihood assets. Their effects are particularly notable for financial and physical capital, indicating that investments in production and infrastructure are well aligned with local needs. In region 2, PP remains the most influential factor, especially in strengthening social, financial, and physical capital. In contrast, CP shows weaker relationships, suggesting limited effectiveness of infrastructure investments without strong production linkages. In region 3, SP and CP have the greatest impact, while PP shows the weakest influence, particularly on natural and human capital. This reflects constraints in implementation capacity and resource availability. Overall, PP and CP are the most influential components for crop production, although their effectiveness varies significantly across regions. LUP exhibits only a moderate level of influence, despite being a factor with significant impact on NRD. This finding aligns with the observation of Jónsdóttir and Gísladóttir (2023) [30], suggesting that the integration of LUP and food system planning needs to be strengthened.

3.3.2. Livestock production

Table 4 demonstrates notable regional disparities in the effectiveness of rural planning and the types of livelihood capital most affected by specific planning interventions.

In region 1, LUP and PP show relatively strong associations with livelihood assets, particularly enhancing natural and financial capital. In region 2, the impacts are more moderate and evenly distributed across planning components, indicating a balanced but less pronounced influence. In region 3, the relationship are generally weaker, reflecting limited resource endowment and lower implementation effectiveness. This finding supports the argument that livestock development is highly dependent on underlying asset endowments such as land and financial resources.

From an SLF perspective, these results suggest that livestock development depends not only on planning interventions but also on underlying resource conditions and investment capacity. This aligns with findings from Ding et

al. (2018) [31]; Li and Wang (2023) [32], which highlight the role of developed breeding industries and supportive policies in improving livelihood capitals, especially in physical and social aspects.

Table 4. Impact of New Rural Planning on livelihood capitals for livestock production

New rural planning	Overall	Natural capital	Social capital	Financial capital	Physical capital	Human Capital
Region 1						
Spatial planning	0.446**	0.345**	0.373**	0.338**	0.373**	0.329**
Land use planning	0.516**	0.427**	0.516**	0.287**	0.512**	0.327**
Production planning	0.543**	0.344**	0.371**	0.483**	0.371**	0.453**
Construction planning	0.394**	0.287**	0.235**	0.411**	0.234**	0.330**
Region 2						
Spatial planning	0.400**	0.283**	0.275**	0.333**	0.289**	0.263**
Land use planning	0.453**	0.238**	0.352**	0.357**	0.400**	0.298**
Production Planning	0.374**	0.156	0.137	0.527**	0.140	0.262**
Construction planning	0.205*	0.120	0.112	0.219**	0.122	0.170*
Region 3						
Spatial planning	0.285**	0.104	0.065	0.310**	0.126	0.251**
Land use planning	0.210**	0.118	0.122	0.146	0.149	0.100
Production planning	0.223**	0.085	0.050	0.256**	0.060	0.199*
Construction planning	0.289**	0.015	0.043	0.344**	0.091	0.295**

3.3.3. Aquaculture production

Table 5 shows that overall impact of NRP on livelihood capitals is generally positive low to moderately (r_s=0.202-0.455**) across all capital types and regions. The limited influence may be due to aquaculture's small share of agricultural land and its reliance on natural conditions, making expansion difficult. As a result, NRP has limited capacity to enhance the capital needed for aquaculture development. This aligns with the findings of Curtis (2009) [33], who pointed out that actual capital aquaculture often depends on private sector involvement, government subsidies or credit institutions.

Table 5. Impact of New Rural Planning on livelihood capitals for aquaculture

New rural planning	Overall	Natural capital	Social capital	Financial capital	Physical capital	Human capital
Region 1						
Spatial Planning	0.353**	0.311**	0.230**	0.340**	0.227**	0.343**
Land use planning	0.305**	0.290**	0.170*	0.276**	0.183*	0.308**
Production Planning	0.430**	0.274**	0.287**	0.457**	0.329**	0.392**
Construction planning	0.087	0.061	-0.011	0.178*	-0.009	0.111
Region 2						
Spatial Planning	0.398**	0.257**	0.287**	0.339**	0.298**	0.275**
Land use planning	0.455**	0.226**	0.362**	0.363**	0.406**	0.309**
Production Planning	0.365**	0.171*	0.125	0.525**	0.116	0.250**
Construction planning	0.263**	0.168*	0.179*	0.238**	0.198*	0.154
Region 3						
Spatial Planning	0.289**	0.100	0.070	0.310**	0.130	0.249**
Land use planning	0.202*	0.087	0.113	0.146	0.142	0.098
Production Planning	0.202*	0.051	0.037	0.256**	0.049	0.186*
Construction planning	0.294**	0.010	0.038	0.344**	0.086	0.295**

In region 2, SP and PP have stronger correlations with livelihood assets, consistent with the region's comparative advantage in aquaculture. In region 1 & 3, the effects are more moderate, indicating that aquaculture development is less responsive to planning interventions where natural conditions are less favorable. This highlights the importance of

aligning planning strategies with local ecological conditions.

3.3.4. Craft village production

The results in Table 6 reveal that NRP has a strong and consistent impact on craft village livelihoods across all regions.

Table 6. Impact of New Rural Planning on livelihood capitals for craft villages

New rural planning	Overall	Natural capital	Social capital	Financial capital	Physical capital	Human Capital
Region 1						
Spatial Planning	0.363**	0.285**	0.343**	0.318**	0.145	0.255**
Land use planning	0.361**	0.278**	0.349**	0.277**	0.093	0.367**
Production Planning	0.525**	0.279**	0.518**	0.446**	0.396**	0.373**
Construction planning	0.400**	0.271**	0.371**	0.369**	0.236**	0.345**
Region 2						
Spatial Planning	0.267**	0.182*	0.173*	0.232**	0.047	0.413**
Land use planning	0.288**	0.236**	0.163*	0.217**	0.097	0.380**
Production Planning	0.515**	0.362**	0.465**	0.431**	0.375**	0.346**
Construction planning	0.158	0.122	0.056	0.110	-0.049	0.390**
Region 3						
Spatial Planning	0.316**	0.357**	0.176*	0.161*	0.179*	0.250**
Land use planning	0.401**	0.457**	0.267**	0.168*	0.147	0.358**
Production Planning	0.078	0.083	0.026	0.016	0.086	0.131
Construction planning	0.318**	0.273**	0.116	0.174*	0.237**	0.342**

Planning components, especially CP and PP, show high correlations with livelihood assets, reflecting the importance of infrastructure and production support in revitalizing traditional industries. Improved transportation, facilities, organizational structures enhance both productivity and market access.

The results suggest that craft village development benefits from integrated planning approaches and strong community participation.

3.3.5. Service production

Table 7 shows that service-based livelihoods are significantly influenced by NRP, particularly in more developed areas.

Table 7. Impact of NRP on livelihood capitals for services

New rural planning	Over all	Natural capital	Social capital	Financial capital	Physical capital	Human Capital
Region 1						
Spatial planning	0.279**	0.386**	0.181*	0.199*	0.152	0.323**
Land use planning	0.348**	0.383**	0.253**	0.266**	0.214**	0.412**
Production planning	0.596**	0.426**	0.553**	0.550**	0.549**	0.463**
Construction planning	0.465**	0.447**	0.383**	0.361**	0.355**	0.496**
Region 2						
Spatial planning	0.452**	0.330**	0.305**	0.393**	0.357**	0.421**
Land use planning	0.458**	0.426**	0.286**	0.371**	0.341**	0.426**
Production planning	0.546**	0.339**	0.502**	0.462**	0.490**	0.366**
Construction planning	0.410**	0.301**	0.266**	0.356**	0.328**	0.427**
Region 3						
Spatial planning	0.474**	0.451**	0.313**	0.217**	0.282**	0.306**
Land use planning	0.572**	0.596**	0.316**	0.249**	0.287**	0.425**
Production planning	0.259**	0.154	0.217**	0.120	0.193*	0.191*
Construction planning	0.413**	0.363**	0.257**	0.170*	0.217**	0.374**

In region 1, all planning components show strong relationships with livelihood assets, driven by better infrastructure and urbanization. This finding is consistent with the observations of Vo and Le (2013b) [34]. It also parallels the DFID (1999) [9], which emphasizes the critical link between structured production interventions and capital enhancement. In addition, CP also correlates significantly with all capitals, especially human capital (r_s=0.496**),

suggesting that improved rural infrastructure facilitates access to education, health, and skill development, fostering long-term livelihood resilience. In regions 2 and 3, the effects are moderate, indicating that service development depends on both planning support and broader economic conditions, including market demand and connectivity. Across all regions, human capital emerges as a critical factor, emphasizing the importance of skills, education, and labor capacity in supporting service-based livelihoods.

3.4. Policy implications

Policy recommendations should be tailored to regional characteristics and dominant livelihood constraints. In regions 1 and 2, PP is the main driver of livelihood improvement, suggesting that interventions such as training, input support, and market linkages can enhance income and resilience. In Region 3, LUP plays a more important role, particularly in supporting craft-based livelihoods through better spatial organization and integration with tourism and local markets. SP and CP consistently show moderate-to-strong influence across regions, indicating the foundational role of infrastructure and services in rural development. The association between CP and human capital further emphasizes the value of access to education, healthcare, and skill development. These findings call for adaptive, region-specific rural planning rather than uniform approaches. Policy recommendations include : (i) region-specific planning, focusing on tailoring strategies to the dominant local livelihoods. In regions 1 and 2, priority should be given to PP, while for region 3, policies should prioritize land-use optimization, support for craft village development, and integration with tourism and local markets. (ii) Investment in integrated infrastructure is crucial, including improvements in roads, communication, and transport to facilitate access to education, markets, services. (iii) Strengthening social capital through cooperatives and community groups will enhance collaboration, knowledge sharing, and risk management. (iv) Additionally, building local planning capacity by enhancing local institutions' ability to design responsive, participatory, and sustainable plans is essential. (v) Establishing monitoring systems to track the effects of planning components on different capitals and adjusting policies as needed will ensure effective implementation. (vi) Finally, aligning land use with economic planning, especially in land-constrained areas like region 3, will support development of craft industries and service sectors. These policy interventions should be implemented in an integrated manner to ensure synergy between planning components and maximize their impacts on livelihood sustainability.

4. CONCLUSION

This study demonstrates that NRP has significant but regionally differentiated impacts on livelihood assets in Tho Xuan. SP and PP play dominant roles in more developed regions, while LUP is more influential in less developed areas. The study confirms the applicability of the SLF in analyzing planning–livelihood linkages and highlights the need for context-specific interventions. However, the study is limited by its cross-sectional design and reliance on perception-based data. Future research should incorporate longitudinal data and quantitative impact evaluation methods to better capture causal relationships. These findings provide a scientific basis for designing more targeted and effective rural development policies in the context of ongoing administrative and socio-economic changes.

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