

## MOTIVATION OF SUSTAINABLE DEVELOPMENT, EVIDENCE OF CHONGQING, CHINA

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**Abstract:** This paper explores the factors influencing the motivation of industrial operators to sustainably develop industries in poor regions of Chongqing, amidst the broader context of rural revitalisation in China. Leveraging Freud's social psychology motivation theory as foundational frameworks, a new model is innovatively constructed and empirically demonstrated through extensive literature research and qualitative analysis. The findings highlight four primary influencing factors: innovation environment, cognition, ecological environment and financing awareness, which affect the industrial operator's motivation of sustainable development of industries in poor regions. Then, this paper propose that traditional Chinese innovation and entrepreneurship culture in fostering an environment can form an innovative and entrepreneurial atmosphere in poverty areas; the development of a rural ecological environment emerges as a strategy to enhance the ecological environment; further encouraging industrial operators' engagement, encouraging self-reliance and proactive development are crucial to empower industrial operators; Integrating digital economy characteristics, the rural industrial operators can optimise capital operation, drawing investments to stimulate the sustainable development of industries. This insights contribute substantively to the ongoing discourse on rural revitalisation, offering pragmatic solutions geared towards sustainable development within impoverished regions in Chongqing and beyond,

**Keywords:** Rural revitalisation; Motivation of sustainable development of industries; Sustainable development of rural industries

### 1. Introduction

China's rapid urbanisation and industrialisation have created new problems for the rural economy, ecology, culture and services, such as exodus, ageing population, poor infrastructure, health problems and education, which have contributed to the decline of the countryside (Zhou, 2020; Tang, 2022). In the context of China's rural revitalisation strategy, the government and various types of enterprises have supported the industrial development of poverty-stricken areas in the early stage and cultivated a number of rural industries, and how these industries can be sustainably developed has become a topic of discussion among current researchers. Summarising the results of previous research by researchers in related fields, it includes many aspects about the research on sustainable development of poverty alleviation industries.

Optimizing the industrial structure which depend on rural agricultural resources, building characteristic industries, and prosper industries with resources of rural regions. Analyzing of the current state and development of agricultural organizations in rural areas on the materials of the

Non-Black Earth Zone of the Republic of Bashkortostan presented, Gusmanovr (2019), professor of Bashkir State Agrarian University, define the problems of the development and implementation of strategic plans for the development of rural areas in relation to Russian practice, which is that the non-black earth zone of the region has a significant production potential, when, if improving the rural labour force, addressing labour imbalances in rural areas and increasing the human resources of highly skilled labour is efficient use to ensure the sustainable development of rural industries. In the economic depression caused by the epidemic, rural areas can give full play to their land resource endowment, and advocates that the government should guide the construction of new areas through land consolidation or the transformation of urban space to stimulate the industrial and economic development of rural areas (Grzelak et al., 2019). Duffy et al. (2021), National University of Ireland Galway, points that it is an effective model for sustainable development that adequate integration of business policies, technology and commerce, and the use of valuable natural resources in rural areas, can effectively create jobs and evenly distribute income, thus promoting sustainable economic development in rural areas.

The government's inclination of poverty alleviation resources to the poor and the industrial operators' integration of industrial poverty alleviation policies can ensure the sustainable development of the industry. The strengthened implementation of these policy guarantee mechanisms, which government should give priority to the poverty alleviation industry, give financial incentives to the poverty alleviation industry, and ensure the implementation of industrial poverty alleviation projects with priority and speed, is conducive to the sustainable development of the poverty alleviation industry, since poverty relief areas have no advantages in terms of geographical location, traffic conditions and human resources (Wu, 2021). Rural infrastructure investment had a significant positive effect on the increment of poverty incidence and the number of households lifted out of poverty in administrative villages during the year, and for every 10,000 yuan increase in rural infrastructure investment, the mean values of poverty incidence and the number of households lifted out of poverty in villages were reduced by 0.89 percentage points and 0.1648 respectively (Huang & Wang, 2021).

Introducing scientific and technological elements to promote rural industry development through science and technology is necessary. Jayashankar et al. (2020), Iowa State University, using qualitative interviewing methods to conduct semi-structured interviews with farmers in the Midwestern United States, establishing linkages between different concepts via NVivo 12, points out that agricultural information technology, through technology interaction, autonomous co-creation, maximizing the value of data applications, and digital sharing in agriculture, ultimately enhances agricultural production efficiency and leads to sustainable development of the agricultural industry. After an empirical study of three regions in eastern Poland, Adamowicz & Zwolińska (2020) argues that the concept of a smart village relying on modern Internet of Things, information technology is useful in promoting sustainable development. Taking advantage of emerging technologies such as varieties, technologies, biological pesticides and biological fertilizers, industrial operators could stimulate the development of industries in poor areas (Lu et al. 2021).

However, above studies have not solved the problem, which is similar to the phenomenon of Chongqing Damu Flower Valley, which industry operators abandon the flower planting industries they have invested in in the middle of the day when policy subsidies and technical support are being provided by the local government. It indicates that there are gaps on the sustainable development research of rural industries in the poor areas. Above researchers ignore the industrial operator's motivation of sustainable development. On the background of rural revitalization, this paper is based on Freud's social psychology motivation theory, takes the typical poverty areas of 5 counties of Chongqing in west China, as the study area, and takes industrial operators of above areas as survey and research targets. This paper will resolve following questions. How the innovation culture influence the industrial operator's motivation of sustainable development in poverty areas? What extent does ecological environment affect the industrial operator's motivation of sustainable development of industries? How do the rural industrial operator's cognition influence their motivation of sustainable development of industries? How do the industrial operator's financial awareness influence their motivation of sustainable development? And main research objects of this paper are to find out the links between innovation culture and the industrial operator's motivation of sustainable development of industries, to evaluate the relation between ecological environment and the industrial operator's motivation of sustainable development, to determine the impact of the industrial operator's cognition and their motivation of sustainable development, to assess the connection between the industrial operator's financial awareness with their motivation of sustainable development of industries. The study results are expected to provide reference for policies formulation of poverty areas authorities in the world.

This paper consists of 6 parts . Part 1 is the introduction, containing the background of the study, a review of previous scholars' studies, the remaining problems, and the research questions, and the objectives of the study. Part 2 is the research methodology and indicators, which contains an introduction to survey sampling methods and modelling techniques. Part 3 is the topic section of the study, which contains the research model hypothesis, questionnaire scale design. Part 4 is analysis of collected data, and model justification section. Part 5 is the research discussion and suggestion, which is based on the effective model to improve the industrial operator's motivation of sustainable development in the poverty-stricken areas. Part 6 is the conclusion part, which include the limitations and shortcomings of the study in this paper, and the future outlook..

## **2. Materials and Methods**

### *2.1. Study areas*

The research is located in Chongqing's 5 counties, China. Chongqing located in the west of China is typical rural areas, with most mountains and less arable land. The research object of 5 counties are the poorest areas in Chongqing. Every year, about 0.78 million registered poor people go out to work in cities. According to the statistics of Chongqing Poverty Alleviation Office disclosed by Chongqing Daily, there are 1 918 poverty-stricken villages in Chongqing, accounting for 22% of the total administrative villages, accounting for a relatively large proportion. So Chongqing's industrial development in poverty-stricken areas is one of the representatives of China's industrial development in poverty-stricken areas. The study of the industrial operator's motivation of

sustainable development is great significance for government departments in other poverty-stricken areas to formulate management policies. This paper takes typical 5 counties poverty area's industries operators, whose enterprises are registered at Regional branches of Chongqing Municipal Administration for Industry and Commerce, as survey and research targets.

2.2. Survey method and interview method.

2.2.1. Sample process

This paper's sample design is probability sampling, and sampling technique is stratified random sampling. The population size is 684.

Table1. the population of industrial operators in 5 counties

Names of districts and counties in Chongqing	N
Wushan	116
Wuxi	164
Yunyang	158
Xiushan	128
Chengkou	118
Total	684

The sample size draws on the findings of the following experts. Miaoulis & Michener (1976) gave their attention to three critical factors: precision, confidence level, and the degree of variability. Sekaran & Bougie (2016) insist that the narrower the interval, the higher the precision. The confidence level states how the estimates made by the researcher will be valid for the target population. This value is expressed as a percentage; for instance, 95%. This is the conventionally accepted confidence level for many, and it implies that 95 samples out of 100 will hold the actual population values within the previously mentioned range of precision. The mathematical formula is as follows.

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

n: sample size

N: population size

e: margin of error

Table2. Determining sample size

N	n	N	n
650	242	850	265
700	248	900	269
750	254	950	274

800	260	1000	278
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Note: N=Population size; n=Sample Size.

Source: Cohen(1969), Krejcie&Morgan(1970), cited from Sekaran & Bougie (2016) and Bougie & Sekaran (2020)

According to this calculate, the sample size of research is 244.

Table3. The sample size of industrial operators

Names of districts and counties in Chongqing	N	S
Wushan	116	42
Wuxi	164	58
Yunyang	158	56
Xiushan	128	46
Chengkou	118	42
Total	684	244

### 2.2.2. Materials and procedure

The data for the study was collected through an online questionnaire. The survey respondents were industrial operators in poverty-eradicating areas of Chongqing, as population introduction. The link to the questionnaire was pushed through the working group of Chongqing Rural Revitalisation Bureau (CQRRB) to the Rural Revitalisation Bureaus of Chongqing districts and counties, which then pushed it to the industrial operators in the poverty eradication areas to encourage them to fill it out and get the corresponding incentive. Some of the industrial operators in the target areas of the 5 county's Chongqing Municipalities received the link and participated in the survey. It is important to note that the valid questionnaires came from industry operators who have operated their industries in the poverty areas, answered for a long enough period of time, and the key value information was sound. Two sections of this online survey were created to examine the following influencing factors, one of which consisted of questions aimed at obtaining personal information from the participants, and the other section was used to measure the hypothetical model established in the research model. The questionnaire was translated into Chinese for industry operators to complete, so industry operators had enough time to complete the questionnaire in Chinese. Finally, More than 500 questionnaires were distributed to industrial operators in poor areas, Chongqing, China, and 363 sample data were returned. After sorting the questionnaires by the time taken to answer, deleting the top 10% that took the shortest time, deleting those with more missing values, those that did not meet the requirements of the research subjects, and those with the same answers to multiple consecutive questions, the study used a total of 244 valid samples, accounting for 74.6% of the recovery rate. According to the research results of Cohen(1969), Krejcie&Morgan(1970), Sekaran & Bougie (2016) and Bougie & Sekaran (2020), the sample size is adequate.

The items of each construct were measured by a seven-point Likert scale, with values ranging from “1 = Strongly disagree” to “7= Strongly agree”. The items used for measuring the constructs were adapted from the existing literature. Considering the validity of the adapted items, the questionnaire was sent to five experts in the field before the actual survey was carried out, in order to ask for an evaluation of its appropriateness and advice for improvement. The items were revised several times following expert’s advice and pretests, then the new scales were adapted to suit the current setting under study.

### 2.3. Variable Measurement and Data Analysis Method.

The operational definitions of all the constructs in this research have been confirmed the following literature review. The questionnaire items in the research are shown in Table 4. The theoretical model used in this research has been analyzed by partial least squares–structural equation modeling (AMOS) through AMOS software (Fronzi et al., 2022). Compared with other methods, AMOS is considered an effective tool for quantitative analysis, and it is suitable for handling data that are normally distributed (Do-Thi & Do, 2022). As this study is more oriented towards the validation and fit of the explanatory model rather than focusing on prediction, AMOS is considered to be an appropriate tool (Ramadani et al., 2022).

Table 4. Questionnaire items and references

variables	code	Questions	type	References
Innovation culture	IC1	I would like to invest and start a business back home.	adapted	Yu, 2020 (p38-44)
	IC2	I believe that Improving the innovation management system is important.	adapted	Mei., 2020 (p41-44)
	IC3	My industries have integrated with related technological industries.	adapted	Yan, 2020
	IC4	I would like to Chang my industrial marketing promotion model.	adapted	Mei, 2020 (p41-44)
Cognition	C1	Comparing to move out for work, I would like to run my own business consistently.	adapted	Yu, 2020 (p38-44)
	C2	My industry can develop on my own efforts, without local government’s subsidy.	adapted	Yu, 2020 (p38-44)
	C3	I believe that the development of the surrounding towns and cities has a driving effect on the village.	adapted	Yu, 2020 (p38-44)
	C4	I believe that relying mainly on government policy support can promote sustainable development of my industries .	adapted	Yu, 2020 (p38-44)

ecological environment	EE1	I believe that the impact of environmental protection is beneficial for the sustainable development of my industries.	adapted	Mao, 2022 (p33-35) Mei, 2020 (p41-44)
	EE2	I believe that damage to the ecosystem can have an impact on industrial development	adapted	Xu, 2020 Yu, 2020 (p38-44)

Continue table

variables	code	Questions	type	References
ecological environment	EE3	I believe that a good ecological environment is the basis for industrial development.	adapted	Mao, 2022 (p33-35) Yu, 2020 (p38-44) Mei, 2020 (p41-44) Lan and Zhang, 2020[34]
	EE4	I believe that ecological governance is the guarantee of a sustainable development of the industry.	adapted	Mao, 2022 (p33-35) Yu, 2020 (p38-44) Mei, 2020 (p41-44) Xian et al., 2023
financial awareness	FA1	I have financial knowledge of savings and loans, insurance and investment.	adapted	Liu and Sun, 2022 Mei, 2020 (p41-44)
	FA2	I believe there are many financial institutions in the location to support the development of the industries.	adapted	Liu and Sun, 2022 Mei, 2020 (p41-44)
	FA3	My own financial savings can support my industry.	adapted	Liu and Sun, 2022 Mei, 2020 (p41-44)
Motivation of sustainable development	FA4	I believe that the current loan rates are suitable for the continued growth of my industry.	adapted	Liu and Sun, 2022 Mei, 2020 (p41-44)
	M1	I have work plans to expand the industry.	adapted	Lan and Zhang, 2020
	M2	I want to invest more in my industry.	adapted	Lan and Zhang, 2020

Continue table

variables	code	Questions	type	References
Motivation of	M3	I want to invest more manpower in the development of my industry.	adapted	Lan and Zhang, 2020

sustainable development	M4	I'm willing to run my industries with other operators in the same business.	adapted	Xian et al., 2023
	M5	I would like to pay a fee to move into an industrial park that has many of the same industries as mine.	adapted	Xian et al., 2023
	M6	I will advise other industrial operators in the same sector to enter the industrial park for joint development.	adapted	Xian et al., 2023

### 3. Hypothesis and Model

#### 3.1. Research hypothesis

##### 3.1.1. Innovation culture and motivation of sustainable development

Some scholarly studies mention the link between innovation culture and motivation, but there is no in-depth empirical discussion. Studing rural Entrepreneurship in Jilin Province in the Context of Rural Revitalization Strategy, China, Zhang and Yang (2020) thought that a good culture of innovation is conducive to sustained investment in industry and increased investment. He (2020) recommended that relevant government departments should vigorously promote scientific and technological innovation in agriculture and related industries, cultivate new momentum for agricultural and rural development through scientific and technological innovation, and promote the development of rural industries. Li (2022, P.70) Argued that the incentive to innovate will stimulate industrial operators to expand their industries. Zhang (2022) pointed that rural areas should strengthen the culture of innovation systems to lead the way, with migrant workers returning to their hometowns to start businesses and expand the scale of agriculture-related industries. Huang (2023), in a study on how innovation culture affects the high-quality development of the Chengdu-Chongqing region's economy, found that innovation culture affects the motivation of the region's business owners for high-quality development.

Accordingly, the H1 hypothesis is that the innovation culture in the poverty village industry has an positive impact on the industrial operator's motivation of sustainable development of industries.

##### 3.1.2. Ecological environment and motivation of sustainable development

Li, Y. and Li, Q. (2019) found that the regulation of the ecological environment is very beneficial for the sustainable development of the regional economy. After studying the economic development of Ethiopia's rural areas, Gebre and Gebremedhin (2019) thought that governments in rural areas should develop policies that focus on and protect the ecosystems of rural areas to ensure their ability to sustainably export the resources needed for the development of large-scale industries to achieve sustainable services. Voronkova et al. (2019) considered that, in connection with the economic development of the rural areas of Russia, a good ecological environment of the rural areas can sustainably provide the resources needed for the development of industry, the need to look at the possibilities of social and economic development of the rural communities, economic entities, the diversification of the territorial economy, the formation of new activities and environmental engineering. Wang (2022) argued that government management in poor areas



needed to carry out green development-oriented rural ecological governance, to be people-oriented and people-centred, to promote solid and deep-level ecological governance modernization work, and to improve the quality and level of rural ecological governance, in order to create an environment for sustainable and large-scale development of rural industries. Eun Ho & Yazigui (2023) argued that eco-environmental protection policies, can form a motivation for livestock operators to form an internal cycle of forage use.

Above all, this is H2 hypothesis which the ecological environment of the poverty areas has a positive impact on the industrial operator's motivation of sustainable development of industries.

### 3.1.3. Cognition and motivation of sustainable development

Fu et al. (2022) found that the short-sighted behaviour of villagers in poor areas have a serious impact on industrial development in the area, leading to a lack of follow-up on scale. Wang et al. (2022) thought that increasing the endogenous motivation of households that have escaped poverty can prevent a return to poverty, and by stimulating the subjective will of households that have escaped poverty, the risk of a reduction in the scale of farming can be minimized. Zhou et al. (2022) argued that the endogenous dynamics of poverty alleviation reduce risk resilience by increasing the scale of cultivation of households emerging from poverty, thus creating a disincentive to return to poverty. In response to the poor population's lack of endogenous motivation to pursue wealth in terms of motivational behaviour, the state needs to incorporate psychological poverty alleviation into the top-level design, establish a rural psychosocial service system, and encourage multiple forces to participate in psychological poverty alleviation in rural areas, so that the population in poor areas can spontaneously develop more industries (Yang et al., 2023).

According to the above scholarly research clues, this paper proposes the H3 hypothesis that the cognition of industrial operators in poor village has an positive impact on their motivation of sustainable development of industries.

### 3.1.4. Financial awareness and motivation of sustainable development

After studying the development of the tourism industry in Indonesia, where Islamic banks are widely distributed, Ameraldo et al. (2019) advised that Islamic banks could establish specialised institutions to run microfinance schemes in rural areas to accommodate the expansion of the tourism industry in rural Indonesia and to minimize potential risks. Wei (2021) suggested that the relevant government departments should establish a financial service system suitable for local rural areas and farmers' needs in accordance with the policy requirements and the actual development of rural industries, innovate rural financial services and develop digital inclusive finance, such as the "Digital Inclusive Finance Project" cooperated by the Shandong Local Financial Supervisory Authority and Ant Financial Services, China, in which farmers are allowed to obtain pure credit, unsecured and unsecured loans by declaring rural land, agricultural insurance, agricultural subsidies and medical insurance. Chen (2022) believes that in order to address the difficulties in financing the expansion of weak economic organizations in poor areas, mainly in the family economy, it is recommended that local governments take the lead in forming financial institutions with various property rights models, such as village and township banks, local government-related guarantee platforms, microfinance companies and mutual fund societies, to broaden the sources of

capital. Tian et al. (2022) believed that building industrial clusters and promoting the combination of agricultural modernization and rural industrial transformation and upgrading, industrial clusters are more familiar with the operations of SMEs within the cluster, more flexible in their assessment, shorter in comparison to traditional lending models, and in granting loans, the object is changed from a single enterprise to a group of enterprises of the same type with increased credibility, thus speeding up the bank's approval process and effectively improving the efficiency of financing for agricultural SMEs. Government management should increase the policy tilt to encourage capital to flow back to rural areas, improve industrial chain development and strengthen economic ties between counties and towns, since the financial spillover effect shows a high negative correlation with industrial development dilemmas, and there is a lack of capital investment for industrial development in rural areas (Liu and Sun, 2022, p9). Rapina et al. (2023) among their study on the impact of financial literacy and financial behaviour on entrepreneurial motivation of accounting students in Indonesia, found that there is a significant positive correlation between financial literacy and financial behaviour of accounting students and their motivation to run a new industry. This leads to the hypothesis H4 that financial awareness of industrial operator in poor villages have an positive impact on their motivation of sustainable development.

3.2. Conceptual equation modelling

The research hypotheses proposed are summarised with reference to the above-mentioned findings of a large number of relevant experts and scholars. A structural equation model of innovation culture, cognition, ecological environment and financing awareness affecting motivation of sustainable development is drawn up.

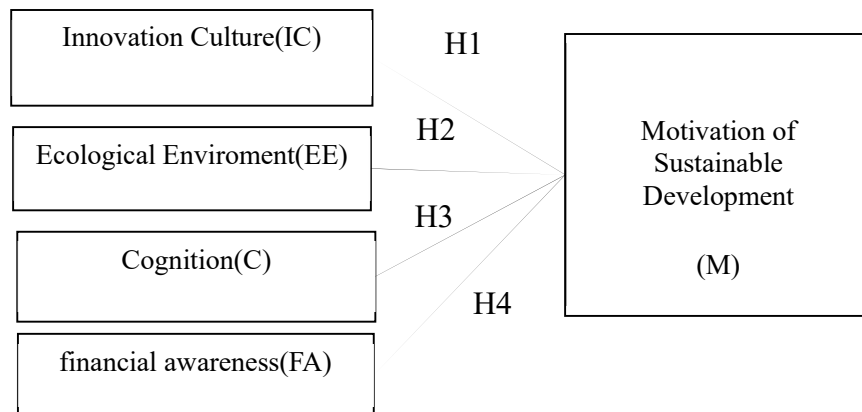


Figure 2. Conceptual equation model

4. Data analysis

4.1. Demographic analysis

4.1.1. Gender analysis

In terms of the gender of the people in the sample, 52.5% were male and 47.5% were female, with a more balanced ratio of males to females, making the age-based correlation analysis more credible and indicating a good recall of the questionnaire.

#### 4.1.2. Age distribution

The proportion of respondents aged 18 to 25 was 0.4% , 26 to 30 was 2.9% , 31 to 40 was 5.7% , 41 to 50 was 23.8%, 51 to 60 was 52.9%, and over 60 was 14.3%. On the age distribution of the collected sample, the total percentage of people aged 51 to over 60 is 67.2%, which corresponds to the age profile of the population in rural areas, indicating that the sample data requirements can make the survey data more convincing.

#### 4.1.3 Education level

Respondents with less than university education accounted for 67.2%, which with specialist and undergraduate degrees accounted for 25.4%, which with master's degrees accounted for 4.5% and with doctoral degrees accounted for 2.9%. The proportion of respondent with less than university education is 67.2%, which is in line with reality and shows that the requirements of the sample data can make the data of the survey more convincing.

Table 5. Educational Distribution of Survey Respondents

Academic distribution	Frequency	Percentage	Accumulate percentage
Below university level	164	67.2	67.2
undergraduate	62	25.4	92.6
Masters	11	4.5	97.1
Doctor	7	2.9	100
Total	244	100	

#### 4.2. Reliability analysis

On the results of the reliability analysis below, it can be seen that the overall standardised reliability coefficient on the variable which “innovation culture” is 0.827, “cognition” is 0.754, “ecological environment” is 0.816, “financial awareness” is 0.895, “motivation of sustainable development” is 0.828, therefore, no adjustment is required for the measurement questions on these variables.

Table 6. Reliability analysis of variables

variables	Cronbach's Alpha values	Number of measurement issues
Innovation culture	0.827	4
Cognition	0.754	4
Ecological environment	0.816	4
Financial awareness	0.895	4

motivation of sustainable development	0.828	6
total	0.954	22

### 4.3. Validity analysis of variables

#### 4.3.1 CFA Model Fit Test

On the results presented in Table 7, it can be observed that the CMIN/DF (Chi-square to degrees of freedom ratio) is 3.222, less than 5. The RMSEA (Root Mean Square Error of Approximation) is 0.076, less than 0.08. While the test results for IFI, TLI, and CFI are all above 0.8. Therefore, considering these results collectively, it can be concluded that the SEM (Structural Equation Modeling) demonstrates a relatively good model fit.

Table7. Model Fit Test

index	actual results
CMIN/DF	3.222
RMSEA	0.076
IFI	0.908
TLI	0.886
CFI	0.907

#### 4.3.2 Validity Test

Table8. Convergent validity and composite reliability tests for independent variable

Item	Path	Variable	estimate	AVE	CR
IC1	<---		0.575		
IC2	<---	Innovation	0.829	0.57	0.84
IC3	<---	culture	0.784		
IC4	<---		0.798		
C1	<---		0.612		
C2	<---	Cognition	0.733	0.51	0.76
C3	<---		0.671		
C4	<---		0.656		
EE1	<---				
EE2	<---	Ecological	0.759	0.53	0.82
EE3	<---	environment	0.777		
EE4	<---		0.709		
FA1	<---		0.743		
FA2	<---	Financial	0.851	0.68	0.90
FA3	<---	awareness	0.832		
FA4	<---		0.872		

Under the premise of a well-fitted Confirmatory Factor Analysis (CFA) model, the convergent validity (Average Variance Extracted, AVE) and composite reliability (CR) of each dimension of the scale will be further examined. The testing process involves calculating the standardized factor loadings of each measurement item on its corresponding dimension through the established CFA model. Then, the values for each dimension are derived using the calculation formula. With all dimensions having an AVE of above 0.5 and a CR of above 0.7, it can be comprehensively concluded that each dimension demonstrates good convergent validity and composite reliability..

4.3.3 Differential validity analysis

As shown in Table 9, the correlation coefficients between the two variables in this test of discriminant validity are less than the square root of the corresponding AVE values of the variables. Therefore, it shows that each variable has good discriminant validity.

Table 9. Differential validity analysis of every variable

	Innovation culture	Cognition	Ecological environment	Financial awareness
Innovation culture	0.57			
Cognition	0.366	0.51		
Ecological environment	0.226	0.286	0.53	
Financial awareness	0.191	0.283	0.145	0.68
Square root of AVE	0.755	0.714	0.728	0.825

The differentiated reliability test for each independent variable is shown in Figure 3.

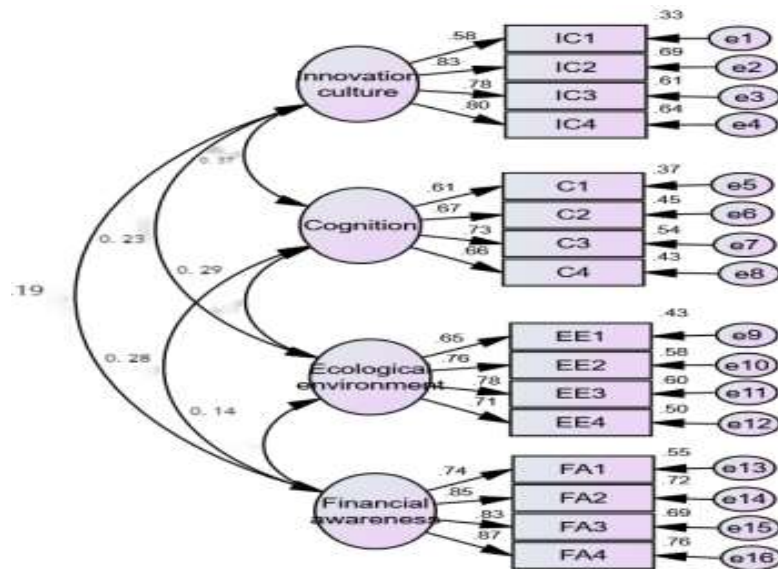


Fig. 3. Plot of differentiated reliability test for the independent variables

4.4 Descriptive statistics and normal distribution

Table 10 shows the results of the descriptive statistics analysis and normality test of the current status of the factors used in this study. According to the results of the analysis of descriptive statistics, it can be seen that the mean scores of each variable are between 5-6, and the scale is

scored positively on a scale of 1-7. Therefore, it can be seen that the level of knowledge of the participants of this study about the measurement question items is above.

The normality test for each measurement question item was conducted using skewness and kurtosis, and according to the criteria proposed by Kline (1998), it is considered that the data satisfy the requirement of approximate normal distribution if the absolute value of the skewness coefficient is within 3 and the absolute value of the kurtosis coefficient is within 8. Based on the results of the analysis in Table 10, it can be seen that the absolute values of the skewness and kurtosis coefficients of each measurement question item in this study are within the criteria. Therefore, it can be stated that the data of each measurement question item satisfies the approximate normal distribution.

Table 10. Descriptive statistics of every variable

Variable	Measurement issues	AV	STD	Skewness	Kurtosis	AV	STD
Innovation culture	IC1	5.27	1.524	-0.81	-0.089	5.354	1.111
	IC2	5.38	1.393	-0.669	0.013		
	IC3	5.38	1.285	-0.874	0.815		
	IC4	5.38	1.263	-0.712	0.178		
Cognition	C1	5.16	1.611	-0.739	-0.463	5.348	1.053
	C2	5.3	1.326	-0.97	0.771		
	C3	5.46	1.38	-0.611	-0.504		
	C4	5.48	1.208	-0.513	-0.317		
Ecological environment	EE1	5.67	1.234	-1.147	1.26	5.716	0.981
	EE2	5.7	1.304	-1.07	0.685		
	EE3	5.66	1.211	-0.886	0.494		
	EE4	5.83	1.133	-1.05	1.09		

Continue table

Variable	Measurement issues	AV	STD	Skewness	Kurtosis	AV	STD
Financial awareness	FA1	5.24	1.537	-0.912	0.063	5.113	1.351
	FA2	5.14	1.599	-0.717	-0.32		
	FA3	5	1.51	-0.636	-0.445		

	FA4	5.07	1.548	-0.701	-0.357		
	M1	5.48	1.347	-1.157	1.246		
	M2	5.34	1.394	-0.71	0.212		
Motivation of sustainable development	M3	5.54	1.205	-1.098	1.662		
	M4	5.56	1.293	-1.064	1.13	5.491	1.076
	M5	5.44	1.379	-0.824	0.297		
	M6	5.59	1.195	-1.168	2.065		

4.5 Relevance analysis

In this analysis, the correlation between the variables was explored through Pearson correlation analysis. According to the results of the analysis, it can be seen that there is a significant correlation between all the variables in this analysis. And all of them are significant at 99% level of significance. According to the results of the correlation coefficient, it can be seen that the correlation coefficient *r* between each variable is greater than 0. Therefore, it can be comprehensively stated that in this analysis, there is a significant positive correlation between each variable.

Table 11. Correlation analysis of every variable

	Innovation culture	Cognition	Ecological environment	Financial awareness	Motivation of sustainable development
Innovation culture	1				
Cognition	0.275	1			
Ecological environment	0.155	0.179	1		
Financial awareness	0.203	0.24	0.144	1	
Motivation of sustainable development	0.768	0.799	0.665	0.75	1

\*\* . Significantly correlated at the .01 level

4.6 Path Relationship Test

4.6.1 CFA Model Fit Test

On the results presented in Table 12, it can be observed that the CMIN/DF (Chi-square to degrees of freedom ratio) is 4.109, less than 5. And the RMSEA (Root Mean Square Error of Approximation) is 0.75, less than 0.08. While the test results for IFI, TLI, and CFI are all above 0.8. Therefore, considering these results collectively, it can be concluded that the SEM demonstrates a relatively good model fit.

Table 12. Model Fit Test

index	actual results
CMIN/DF	4.109
RMSEA	0.75
IFI	0.824
TLI	0.88
CFI	0.821

4.6.2 Analysis of path relationship

According to the analysis of Table 13, it is evident that in the path hypothesis testing of this research model, the innovation culture significantly and positively predicts the rural industrial operator’s motivation of sustainable development ( $\beta = 0.314, p < 0.001$ ), therefore, Hypothesis H1 is supported. The ecological environment significantly and positively predicts the rural industrial operator’s motivation of sustainable development ( $\beta=0.235, p<0.001$ ), therefore, Hypothesis H2 is supported. The rural industrial operator’s cognition significantly and positively predicts their motivation of sustainable development ( $\beta=0.808, p<0.001$ ), therefore, Hypothesis H3 is supported. The rural industrial operator’s financial awareness significantly and positively predicts their motivation of sustainable development ( $\beta=0.439, p<0.001$ ), therefore, Hypothesis H4 is supported.

Table 13. Path Relationship Test

dependent variable	path	independent variable	Estimate	S.E.	C.R.	P
Motivation of sustainable development	<---	Innovation culture	0.314	0.036	5.376	***
	<---	Ecological environment	0.235	0.04	4.27	***



<---	Cognition	0.808	0.085	7.258	***
<---	Financial awareness	0.439	0.03	6.686	***

4.7 Model path diagram

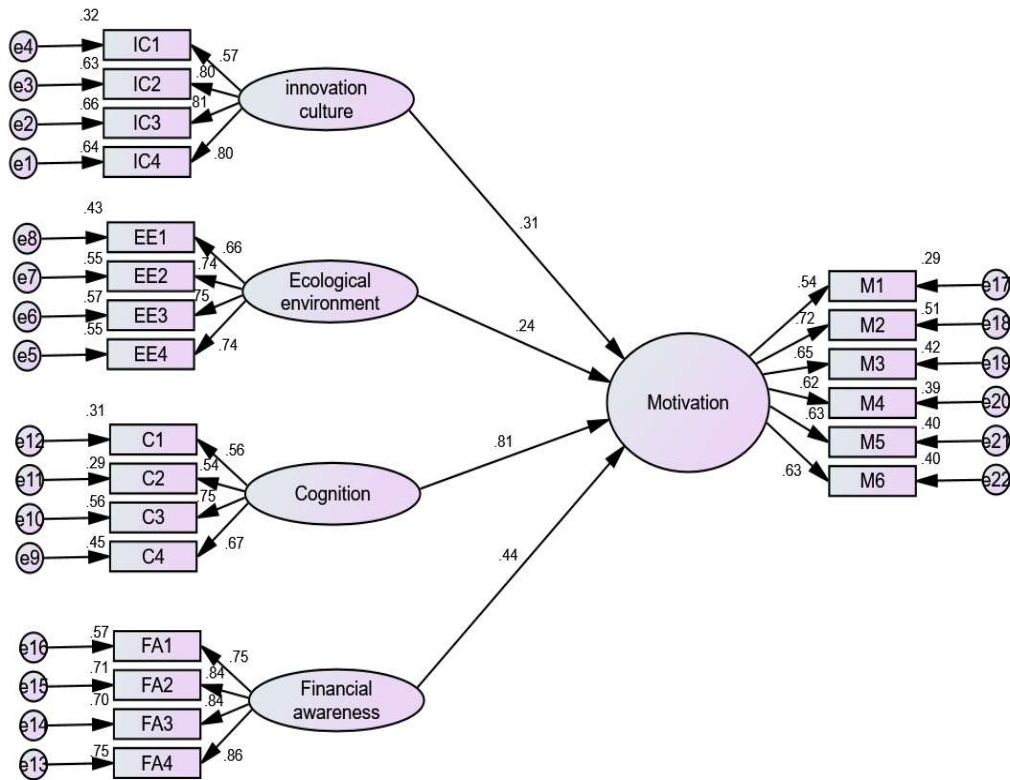


Figure 4. This is the Model path diagram of hypothesis

5. Summarizing Data Insights and suggestion

This paper conducts empirical evidence by constructing a structural system of equations model, and on the results of the empirical study, the following conclusions are drawn. Innovation culture, ecological environment, the industrial operator’s cognition and financial awareness have a positive impact on their motivation of sustainable development of industries, with their cognition being the most significant influence on their motivation, followed by financial awareness, innovation culture and ecological environment. On the findings of the study, the following suggestions are made to the poor area’s relevant government administrations to formulate policies, which are appreciate to stimulate this area’s industrial operator’s motivation of sustainable development of industries.

5.1. Cultivate innovation culture

Building an innovation support mechanism in rural areas to provide protection for innovators in terms of landing projects, financing, fine services and technical escort is crucial.

As the Experience of Japan and Korea, local authorities should Improve the incentive mechanism for talents to serve the countryside, let the opportunities in the countryside attract people, let the environment in the countryside retain people, coalesce policy synergy, form a good environment for innovation and entrepreneurship in rural areas, in order to let young people returning to their hometowns to start their own businesses come back, stay and do well, and maximize the intrinsic vitality of talents, so that they can give full play to their abilities, and display their talents and show their talents in the vast world of the countryside.

Learning from the experience of the United States in the development of rural revitalisation, making good use of the intellectual resources of local universities, rural industry operators can be allied with them to mobilise researchers from local universities to join the enterprise's technological innovation, management innovation, operational innovation system, so as to form a school-enterprise alliance, university-enterprise fusion, the integration of industry and education of the culture of innovation.

Local governments in poor areas should build more innovation learning and exchange and sharing platforms to encourage rural industry operators to carry out practical innovations that are needed for industrial operations, and then carry out exchanges and sharing on exchange platforms with corresponding incentive mechanisms, such as cash rewards based on the amount of exchanges and sharing; as well as organize all kinds of training related to the dissemination of innovative knowledge through the platforms, inviting rural industry operators to participate in the training on a regular basis, and encouraging them to carry out industrial operations in accordance with the methodology learned from the training, with the corresponding incentives.

Business administration departments at the township government Optimise the service platform for rural industry operators, simplify the approval process and improve their efficiency for new business models and new industrial forms, and stimulate the creative energy of the rural market.

### *5.2. Ecological environment and development can be synergised.*

And, Over the past 40 years, China's development model in rural areas has largely adhered to the resource-endowed development model, whereby where there are abundant natural resources such as ores, timber, and hydro-power, the natural resources of the area are exploited to their advantage, and these natural resources are consumed and converted into incentives for industrial development. Such behaviour is not conducive to sustainable development, and also has a huge negative impact on the motivation of industrial operators to sustainably develop their industries, as argued above. How to protect the ecological environment in poor areas, the operators of industries in rural areas can look to the digital driver. Under the digital economy, rural industry operators can optimize the structure of their industries by adopting new digital technologies to lower their operating costs, improve the quality of their products, and reduce the depletion of natural resources. Under the digital economy system, rural industry operators can make full use of the Internet, big data, cloud computing and other emerging digital technologies to conduct a detailed and comprehensive analysis and evaluation of market demand and supply, respond to consumer trends, and explore

the potential tourism, leisure, recreation and health care functions of the region where the industry is located, and activate ecological elements. In the digital economy, rural industries can show pure green development, since digital technology has also made mobile phones into a "new farming tools", live broadcasting has become a "new agricultural affairs".

Also, the rural authorities can join forces with universities and relevant research institutions to strengthen the cooperation between government, industry, academia and research models, and are committed to the research, development and application of green industrial development paths, to create a green development and ecological balance through the help of technology, and to achieve the maximum economic benefits of the industrial chain.

The rural authorities encourage rural industrialists to improve and popularise their production techniques in accordance with local conditions, to raise awareness of their social responsibility to protect the environment, to improve the protection of the land and to maximise the use and sustainability of land resources.

The rural authorities should establish and improve positive and negative incentives, providing positive incentives such as tax concessions for those who focus on ecological protection, and negative incentives such as administrative fines for those who destroy the ecological environment in pursuit of economic gain.

*5.3. Changing the perception of the rural industrial operators as a wait-and-see policy is more important than anything else.*

About the industrial operator's cognition in poor areas, the local government sector has adopted the following approach to enhance self-development. Psychological resources are stimulated by role models, strengthened through education, and consolidated through the provision of social support, for example, through the use of Internet video platforms, television, radio, bulletin boards and other publicity tools to Disseminate typical examples of poverty eradication and enrichment, to promote the traditional Chinese cultural virtues of self-improvement and enterprise, and to break with the poverty alleviation model of giving policies and subsidies.

Preparation of a standardized, professional and efficient operation manual for psychological poverty alleviation, so as to streamline the process of common psychological support work, and then combine it with professional psychological assessment tools, so as to provide point-to-point support for the individual psychological "problems" of rural industrial operators, and to improve the efficiency of psychological poverty alleviation work.

When local government departments provide cash subsidies for industrial operations, tax exemptions and other transfers to industries in poor areas, they set appropriate conditions to avoid unconditional transfers as much as possible. These conditions may include, for example, the area of industrial operation, the length of industrial operation, the annual improvement of the industry operated, the jobs provided by the industry operated, and the annual increase in the output value of the industry operated, etc. This will avoid the phenomenon of having policy incentives, which is that when there are policy incentives, industrial operators continue to develop, but when there are no policy incentives, industrial operators downsize.

On the one hand, rural industry operators in poor areas take advantage of the cheap labour resources in poor areas to reduce the production costs of their products; on the other hand, they must learn to make use of digital technology, pay attention to changes in consumer spending, adjust their production strategies in real time, and produce high-quality, low-priced products to meet market demand. Ultimately, the agro-industry has to meet market demand in order to achieve complete self-reliance and sustainable development.

#### *5.4. Improving of financial awareness*

Additionally, the financial awareness of rural industry operators is a very important factor influencing the motivation of sustainable development. The educational level of the rural industry operators is not high, as shown by the educational level of the research participants, 67 per cent of which did not attend university. Since financial literacy, which encompasses processes, policies, and varieties, is specialised, the financial literacy of rural industry operators is very poor. In order to improve this situation, first of all, the local government departments, in conjunction with financial enterprises, should train rural industry operators in the necessary financial knowledge, including the loan process, loan interest rates, financing methods, equity incentives, and so on, so that rural industry operators can find the appropriate financing methods in accordance with their own industrial business needs.

Secondly, rural industry operators need to recognize the importance of their creditworthiness for financing, so that they can improve their financial credit information in the course of their daily operations.

Lastly, as rural industry operators have little collateral assets other than the industries they operate to guarantee their loans, it is necessary for poor regional governments to introduce third-party financial institutions and specialised enterprises familiar with rural industries to build an efficient and simplified guarantee platform based on the shares of the industries they operate to provide guarantees for the financing of rural entrepreneurs in the event of expansion of their production scales. The Ministry of Finance of Yong'an City, Hunan Province, China, has joined forces with rural commercial banks and tea-selling enterprises to set up a guarantee company that provides guarantees for the financing of tea growers in poverty-stricken areas. The company provides guarantees for loans to tea growers to expand cultivation, and the guarantee fee charged is subsidized by the local government, which is equivalent to the low interest rate that tea growers pay on loans for poverty alleviation through rural industrial development, which is about 60 per cent of the market rate. If the tea grower defaults on the loan, the guarantee company is responsible for repaying the bank's loan, but the equity of the tea plantation operated by the tea grower will be transferred to the guarantee company in an equivalent share. Subsequently, the tea merchant members of that guarantee company will hold that share on behalf of the bank in accordance with the agreement, carry out the subsequent operation of the industry, sell the tea, return the funds to make up for the losses of the guarantee company, and realise a certain percentage of the proceeds. This policies fully stimulates the development motivation for tea growers to expand their scale of production and grow tea on a sustained basis.

## **6. Conclusions**

The abstract presented highlights a comprehensive research study that explores various factors impacting industrial operator's motivation of sustainable development of industries in impoverished regions. The paper's multifaceted approach, integrating insights from innovation culture, ecological environment, the industrial operator's cognition, the industrial operator's financial awareness, establishes a well-rounded viewpoint that considers the intricate dynamics of the industrial operator's motivation of sustainable development of industries. Utilizing motivation theories rooted in social psychology, the paper presents a hypothetical model that elucidates the motivation origin of industrial operators in these economically challenged areas. Data gathered from a sizable group of respondents validates and refines this model, offering actionable insights for policy development. While the paper is commendable for its thorough exploration, it acknowledges a limitation regarding the specificity of its target demographic - industrial operators in impoverished areas. This focus, while integral to the study's objectives, presents an opportunity for future research to explore the decision-making behaviors of other key stakeholders, including government officials and the general populace. By expanding the scope, subsequent studies could offer a more holistic view of the complex dynamics at play, contributing to more effective, inclusive policy formulations that address the diverse needs and challenges of all stakeholders. Moreover, future research could benefit from an international perspective, examining similar dynamics in impoverished areas globally. This could foster a comparative analysis that elucidates commonalities and distinctions in industrial development challenges and opportunities across diverse contexts.

Lastly, the integration of technology and innovation as crucial variables in the study is pivotal. Future research could explore the role of emerging technologies, such as AI, IoT, and blockchain, in transforming industrial landscapes, enhancing productivity, and fostering sustainable development in these regions.

In conclusion, this paper makes a significant contribution by unveiling intricate dynamics influencing industrial development in impoverished areas, laying a foundation for future research and policy development. The expansion of the research scope and the incorporation of global perspectives and technological innovations could further enrich insights, driving more impactful, sustainable solutions for industrial development challenges.

**Author Contributions:** Conceptualization, Zheng Xingpeng and Jacqueline Tham; Formal analysis, Zheng Xingpeng; Funding acquisition, Zheng Xingpeng; Investigation, Zheng Xingpeng and Jacqueline Tham; Methodology, Zheng Xingpeng and Ali Khatibi; Project administration, Ali Khatibi; Resources, Zheng Xingpeng and Jacqueline Tham; Software, Zheng Xingpeng and Ali Khatibi; Supervision, Jacqueline Tham and Ali Khatibi; Validation, Zheng Xingpeng; Writing – original draft, Zheng Xingpeng; Writing – review & editing, Ali Khatibi.

**Funding:** This research was supported by the Science and Technology Research Program of Chongqing Municipal Education Commission (Grant No. KJQN202301906) and was funded by the Humanities and Social Sciences Research Project of Chongqing Municipal Education Commission in 2022, which name is “research on the mode and path of industrial sustainable

development in Chongqing poverty alleviated areas under triple pressures”(Grant No. 22SKGH504).

**Institutional Review Board Statement:** The ethics committee’s approval is waived because all participants voluntarily provide information about various issues on their own, based on an anonymous questionnaire.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data are currently not publicly available due to participant privacy, but they are available from the first author upon reasonable request.

**Acknowledgments:** We are grateful to the Rural Revitalization Bureau of Chongqing and its affiliated agencies because it is with their assistance that this research was carried out, as well as the industrial operators involved in the development of the project. We would also like to thank the anonymous reviewers for their insightful comments, which have greatly contributed to improving the quality of this research.

**Conflicts of Interest:** The authors declare no conflict of interest.

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