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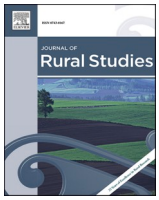

The path of social integration of migrants in poverty alleviation relocation: A case study of dongchuan from Yunnan plateau mountainous areas

Lu Feng [a], Wei Yang [b,c], Jianhui Yun [d,*], Yan Zhang [a]

[a] College of Economics and Management, Yunnan Agricultural University, Kunming, China
[b] Social Science and Economics, NIWA - The National Institute of Water and Atmospheric Research Ltd, Hamilton, New Zealand
[c] Department of Value Chains and Trade, Faculty of Agribusiness and Commerce, Lincoln University, Canterbury, New Zealand
[d] College of Humanities and Social Sciences, Yunnan Agricultural University, Kunming, China

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ABSTRACT

Poverty eradication is a critical objective of the Un 2030 Agenda for Sustainable Development. China's Poverty Alleviation Relocation (PAR) has made positive contributions to global poverty alleviation. The success of PAR depends on identifying factors affecting migrants' intentions to move and understanding their lives post-PAR, which is usually ignored in the literature. Therefore, based on the social integration theory, this study adopts a structural equation modeling framework to empirically explore the social integration process of PAR migrants using the sample data sourced from a survey on the resettlement site in Yunnan province, China. The results show that the social integration of PAR migrants goes through the path of economic integration, community integration, and psychological integration, where community and social support help migrants to transition from improving economic standards of living to finding a place attachment and being a member of the new community. The empirical evidence indicates policymakers should consider providing support for PAR migrants to participate in community activities and engage with residents to gain social capital for them to adapt to the new community.

1. Introduction

The eradication of extreme poverty for all people by 2030 is a critical objective of the 2030 Agenda for Sustainable Development, where "end poverty in all its forms everywhere" is the first on the list of the 17 sustainable development goals (United Nations, 2022). With the global coalition of governments, businesses, and individuals, global poverty rates have declined steadily over the past 25 years, and many developing countries, such as China, have contributed to this significant achievement (United Nations, 2022). China has implemented several poverty alleviation policies over the years to combat poverty and improve the well-being of its citizens which have achieved remarkable results. According to the World report, nearly 100 million rural residents were lifted out of poverty between 2013 and the end of 2020, and the poverty headcount ratio in rural areas decreased from 10.2% in 2012 to less than 1.4% in 2020 (World Bank, 2022).

Poverty alleviation resettlement (PAR) is one of the most important initiatives of the targeted poverty alleviation campaign to tackle extreme poverty in China (SCIO, 2021). In many impoverished areas, the government initiated large-scale relocation programs to move rural individuals living in areas with poor living conditions, fragile ecological environments, and frequent natural disasters to places (either rural or urban resettlement) with better infrastructure and access to services. This was done to improve living conditions and provide opportunities for employment and education (Li et al., 2011; Xue et al., 2013; Lo et al., 2016; Lo and Wang, 2018; Gu and Yeung, 2020; Yang et al., 2020; Zhu et al., 2021; Xu et al., 2021; Yang and Qian 2022; Liu et al., 2019, 2023; Guo et al., 2023, 2024). Given the voluntary characteristics and complexity of the relocation process, the literature on PAR has mainly focused on ex-ante research on PAR, looking into understanding the factors that affect residents' willingness to relocate. Results of these studies show that residents' willingness to relocate to new places is dependent on a group of determinants, including poverty alleviation, education, and natural disasters (Gutiérrez-Romero and Salgado, 2023; Liu et al., 2019; Yang et al., 2020).

Since 2016, the PAR has developed to focus on providing public services in relocated areas, ensuring stable poverty alleviation and social integration, and promoting follow-up development. This is mainly due

* Corresponding author. College of Humanities and Social Sciences, Yunnan Agricultural University, Kunming 650201, Yunnan Province, China.
E-mail address: yauice@ynau.edu.cn (J. Yun).

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to the concerns about social dislocation and loss of cultural heritage in some cases, and the economic benefits may not be evenly distributed, with some households experiencing little or no improvement in their living standards (Liu et al., 2019). Therefore, it is only in recent years that some studies have started to evaluate PAR from an ex-post perspective to explore how residents live and adapt to new communities after relocation, looking at the economic, social, and cultural components. Those studies find that PAR reduces income poverty and multidimensional poverty, such as education, medical treatment, and social security (Guo et al., 2022; Li et al., 2022; Yang et al., 2021), by improving living standards through wage and property income and a comprehensive set of assistance measures, such as infrastructure and public service (Liu et al., 2023). Notably, the effect of poverty alleviation may become more significant with longer relocation time, and it differs across regions (Lin et al., 2020); the complexity of the resettlement process could also affect the expected impact of poverty alleviation, considering the social, economic, and environmental considerations. That is, PAR's success is not only determined by successfully convincing and relocating the residents but also by ensuring the well-being and rights of the migrants are respected and supporting their settlement and adaptation to the new place.

A research gap arises regarding the lack of understanding of the pathway that how migrants adapt to the new environment and communities, with the consideration of both economic and social integration in the context of PAR in China. Although there is no single adaptation route for residents to relocate and resettle in new communities, a few studies have revealed three key components that determine the success of adaptation, including economic, social, and psychological integration (Li et al., 2011; Qiu et al., 2021; Rogers et al., 2020). These three adaptation components are key to providing community support, such as basic infrastructures and social interaction, to build place attachment, the ignorance of which may result in mental health issues and affect migrants' well-being (Zhang et al., 2022; Zhu et al., 2021). In addition, PAR programs in China are mainly centralized by central and regional governments, and thus the relocation integration process is greatly coordinated by economic and political support. However, successful integration is characterized by cultural, psychological, and societal factors (Hu et al., 2022; Tang et al., 2022), which have not been well addressed in practice. Most importantly, the existing studies on the exploration of residents' adaptation to the local environment consider the adaptation components to be parallel developed (Liu et al., 2023; Tang et al., 2022). However, it is the interactions of the adaptation components that help migrants integrate into the new living environment, and social integration bridges the gap between the intake of economic support and psychological integration where migrants feel and find the place attachment (Brydsten et al., 2019; Luthans et al., 2006).

Considering the foretasted gaps in the literature, this study aims to investigate the pathway of adaptation of the PAR migrants in resettlement sites, with a focus on the role of social integration in helping the effectiveness of relocation policies for poverty alleviation. Built on the theoretical framework of social integration, a simultaneous equation modeling method is used to empirically analyze how human, economic, and social capital contribute to the adaptation process, where social adaptation plays a role in transforming economic adaptation into psychological adaptation. The empirical analysis is based on the sample data sourced from a survey of PAR migrants in Yunnan province, China. Given the uneven distribution of the rural poor (Liu et al., 2017), poverty mainly presents in remote deep rocky mountainous areas (especially in southwestern China). The case chosen in the current study represents the group of rural poor suffering from extreme poverty: though willing to be relocated to new places, they find it hard to adapt to local communities.

The contribution of the study is twofold. First, this study is one of the first empirical attempts to explore the path of integration of PAR migrants to new resettlement sites in China, using a case from the Dongchuan Yunnan Plateau Mountainous Areas, here, we find that migrants follow the progress of economic, social, and psychological integration as a new way to adapt to new communities and address the importance of social integration in determining the success of residents' adaptation. Second, the results of the study may help form and improve the supporting policies for PAR programs. In addition to economic support, policymakers need to consider the pathway of migrants' adaptation progress to build community support for better social integration.

The remainder of the paper is organized as follows. Section 2 presents the literature and hypotheses developed to answer the research questions of this study. Section 3 describes the research methodology and data used in the empirical analysis. The empirical results and findings are presented and discussed in Section 4, followed by Section 5 to conclude the study.

2. Literature review and hypotheses2.1 theoretical background

2.1. Social integration and dominant capitals

Since the mid-1990s, social integration, like globalization, has become a buzzword in the international community and organizations – as people move from one region to another (Chan et al., 2006). The incorporation of migration by a community is a process of social integration, which refers to the process and extent to which minority groups are fully integrated into the broader society. It is a key aspect of the assimilation process that minority groups undergo to become fully accepted members of the broader society. Also, social integration is composed of two dimensions that are important for the complex and multifaceted nature of assimilation (Gordon, 1964). The first dimension is structural integration, which refers to the economic and political institutions of local society, including access to education, employment, housing, and other resources necessary for full participation in society. The second one is cultural integration, which refers to the adoption of local cultural norms and values by minority groups, including language, customs, and beliefs shared by the broader society. Bourdieu (1998) examined the logic of social domination in developed societies and the mechanisms governing self-disguise and self-sustainment and defined the two kinds of capital, human and social, that structure the arrangements and govern the life chances of groups and individuals. Junger-Tas (2001) further indicated that in the transition of the two living spaces of immigrants (i.e., structural, and cultural integration) to the newly immigrated residence, the renewal of human capital is the key factor for immigrants to achieve social integration.

Social integration theory, over time, has developed from Gordon's (1964) definition to an analytical framework of social integration composition of human, social, and psychological capital (Bourdieu, 1998; Judge, 2009). Social capital plays a significant role in the success of participatory micro-regeneration projects, but the forms and effectiveness of social capital differ across contexts (Yan et al., 2019). The localized social capital, including social participation, social trust, and social intercourse, contributes to the social integration of migrants (Yuan and Li, 2012). The theory of social integration proposes that immigrants need various supports from the government or society after they immigrate, which requires the establishment of a new social network support system. Thereafter, Luthans et al. (2006, 2007) introduced psychological capital and characterized it by four key components: hope, efficacy, resilience, and optimism. These components can help individuals develop the resilience, flexibility, and confidence needed to succeed in challenging situations, both personally and professionally.

When discussed in the context of the organizational study (e.g., organizational behavior and work performance), psychological capital serves as a psychological regulator that transforms human capital and social capital into the fundamental elements of reality. It is a crucial internal force that enhances an individual's career choices, career

identity, and work performance. Moreover, it exhibits measurable and exploitable characteristics of organizational behavior, and its composition may vary across diverse cultures and groups. Judge (2009) defines core self-evaluation (CSE) as an individual's fundamental appraisal of their worthiness, competence, and capability based on their self-assessments. It argues that individuals with high CSE tend to have a positive view, while those with low CSE tend to have a negative view of themselves. Therefore, CSE as psychological capital is a measure of an individual's overall sense of self-worth, self-confidence, and self-esteem, and it is a critical factor in determining an individual's success, well-being, and happiness in life.

The social integration theory provides theoretical support for exploring the pathway of PAR adaptation and the design of the empirical analysis. Note that, although the DFID (Department for International Development) theory of five livelihood capitals has also been used in migration studies, some of the capitals, such as natural and financial capitals, are not applicable in the context of PAR. PAR migrants in many cases have experienced a change of "identity," from peasants/farmers to urban cities. In addition, "The process of migrants" integration of China is divergent from Western countries" (Lin et al., 2020, p1), and the integration paths and processes are formed due to regional differences. The research results of heterogeneous migration cases help to clarify the research paradigm of social integration and provide theoretical support for PAR within this framework.

2.2. The measurement indicators of social integration

Social integration is a fundamental aspect of social structure that shapes the behavior and attitudes of individuals, and it includes structural, cultural, and normative dimensions (Blau, 1960). At the structural dimension, the increased economic integration may lead to increased cultural integration, such as shared values and beliefs, which, in turn, leads to increased normative integration (conformity to social norms). Social integration at the macro level focuses on the social links and social integration in the whole society based on the characteristics of the population, such as race and immigration. The application of social integration theory in the micro aspect tends to understand individual identity and group integration through individuals' attitudes and behaviors (McPherson and Smith-Lovin, 2002).

Social integration is a multidimensional concept that refers to people's ability to engage in various aspects, such as social, cultural, economic, and political life in their local community (Brydsten et al., 2019). The definition and measurement of social integration vary depending on the context, but scholars have identified four dimensions to assess social integration, including economic, political, cultural, and psychological integration (Chan et al., 2006; Lu et al., 2013; Yuan and Li., 2012; Yan et al., 2019; Lin et al., 2020; Yang et al., 2021). However, the progress of the specific measurement indicators differs across studies. Some studies believe the different indicators develop simultaneously and contribute to the extent of social integration equally (Junger-Tas, 2001; Luthans et al., 2006; Brydsten et al., 2019; Zhang et al., 2022). Others argue that measurement indicators contribute to social integration differently, and the importance associated with the measurements has been found to differ across contexts. For example, economic integration is found to be more important than sociocultural integration in reducing the negative attitudes toward support for redistributive policies in the EU (Burgoon, 2014); social support is found to be the key to help improve individuals' well-being, in particular, mental health (Thoits, 2011; Turner and Turner, 2013).

In practice, however, social integration for individual residents/households is developed through a progressive mechanism from economic integration to social and cultural commitment and then to achieve the "real" integration psychologically to be a member of the society. Specifically, economic integration is often regarded as the starting point of social integration that plays a fundamental role in supporting residents to gain the basic conditions to adapt to a new community. With economic integration, residents' social integration develops and improves along with the years of residence in the new community (Laurentsyeva and Venturini, 2017). Given those migrants are relocated from remote and poor regions to relatively developed and richer areas, improving their economic conditions is the first step for them to integrate into the new community. Seen as the advanced and final stage of social integration, psychological integration is regarded as more likely to be influenced by individual factors (Wang and Ning, 2016), it is also affected by the status quo of economic integration and social support gained for new residents. Notably, economic integration (e.g., increase in income or working opportunities) itself could not ensure the success of social integration, and social/community support is needed for new settlers to overcome the social divide between old and new residents (Feng et al., 2002). Overall, in the process of social integration, there is no rule of thumb regarding whether there is a progressive logical relationship from the economic level to the social, cultural, or psychological levels, or what the progress of this relationship is. Nevertheless, there is support for the literature that economic integration is often seen as the starting point of social integration, playing a fundamental role (Laurentsyeva and Venturini, 2017). Meanwhile, psychological integration based on economic and political integration is considered the advanced and final stage of social integration (Lu et al., 2013; Gu and Yeung, 2020; Lin et al., 2020).

Next, the arguments about social integration shown above have been partly validated in the context of PAR (Gu and Yeung, 2020; Lin et al., 2020; Lu et al., 2013). PAR is believed to reduce income poverty and multidimensional poverty by increasing migrants' income and living standards (Liu et al., 2023). The significant impact of PAR on settlers' financial condition can be seen as a means of economic integration into the new community, which is extremely important for poverty-stricken households (Guo et al., 2022). Note that economic integration (via financial support) comes with social support from both the central and local governments and industries. All these, especially community support, contribute to building migrants' place attachment (Zhu et al., 2021). PAR has not only materially changed the spatial environment but also the fundamental meaning of place for farmers (Xu et al., 2021). The PAR initiative has gone through changes and improvements over time. However, the existing literature on poverty resettlement is relatively thin and has yet to detail rapidly evolving policies or how these are playing out on the ground (Rogers et al., 2020). Notably, debates exist in the literature on PAR regarding the impacts (either pre- or post-PAR). One stream of work has addressed the problematic issues in PAR, including economic precarity, unwillingness to give up rural land and Hukou (i.e., household registration system), and poor opportunities in local employment, and, more broadly, explored the deeply political nature of these interventions (Lo, 2018; Xue et al., 2013; Rogers et al., 2020; Yang and Qian, 2022; Du, 2022), such as empowerment has a large positive effect on social integration (Guo et al., 2023, 2024). Another stream of work has mainly focused on tracking the process and progress of lives of migrants after relocation, trying to understand the key determinants of integration and how that might help PAR migrants move on to new lives in new places (e.g., Gu and Yeung, 2020; Lin et al., 2020; Lu et al., 2013). Not attempting to join the debate, the current study aims to present evidence of the PAR case of Dongchuan, Yunan province, to explore the feasible pathway of social integration for migrants; the case study also fills in the gap that there is a lack of observations from Plateau Mountainous Areas in the existing case studies and samples of empirical studies (Xu et al., 2021; Xue et al., 2013; Lo et al., 2016, 2018; Yang and Qian 2022; Guo et al., 2023, 2024).

2.3. Hypothesis development and conceptual analysis framework

The theoretical analysis provides a clear gap in understanding the pathway of social integration of migrants in PAR in China, where the economic, social, and psychological measurements have been seen to develop in parallel. However, in practice, the improvement in economic

conditions is the first milestone for PAR migrants to integrate into the new community whilst social support is needed to help them feel like members of the new community – achieving "real" social integration psychologically.

Note that, before understanding the pathway of social integration, it is important to identify the dominant capitals that contribute to the different measurements of social integration, i.e., economic, social, and psychological dimensions. The literature on social integration provides some insights into the understanding of how different dominant capitals impact the level of social integration. When looking at the starting point of social integration, we first explore the impact of dominant capital on economic integration and propose the first hypothesis.

H1. Dominant capitals enhance economic integration.

Furthermore, three types of dominant capital contribute to developing economic integration, respectively.

H1a. Human capital enhances economic integration.

H1b. Social capital enhances economic integration.

H1c. Psychological capital enhances economic integration.

As can be seen in Fig. 1, human, social, and psychological capital contributes to economic integration. Here, as for human capital, household size, educational level, age structure, and working experience are some of the significant determinants of the level of human capital (Li et al., 2011; Van de Riot, 2014). Potential working opportunities can help migrants build financial independence and strengthen broader social inclusion (Hooper et al., 2017). Thus, being able to find a job is crucial for migrants to settle down and successfully integrate into the new community. Regarding social capital, migrants may gain that from interacting with other migrants as well as from dealing with residents/neighbors (Wang and Ning, 2016). Thirdly, psychological capital plays a role in balancing the relationship between individuals' subjective satisfaction with the status quo (e.g., financial and living conditions) and the intention to maintain and improve the status quo (Cole, 2006). Psychological capital may significantly affect individuals' work performance and further affect their income and economic integration into the new community.

Support for economic integration for migrants could be the first and most important process for them to adapt to the local environment, considering disparities in economic development between the migrants and existing residents of the settlement sites (Liu et al., 2017). The literature on the social integration of immigrants shows that economic development disparities between regions can negatively impact the social integration of migrants (Fratesi and Percoco, 2014), indicating the important role of economic integration in social integration. Reducing the economic divide could help migrants build self-confidence participate in activities and take responsibility in the new community (Entzinger and Biezeveld, 2003; Spencer and Charsley, 2021), through which migrants can gain place attachment once they feel they are members of the community. We hence propose the second hypothesis.

H2. Economic integration enhances psychological integration through community integration.

In that way, economic integration is expected to positively affect community social support and psychological integration.

H2a. Economic integration enhances community integration.

H2b. Economic integration enhances psychological integration.

Community integration is not a one-way process, i.e., migrants' adaptation to the new community, but a two-way interaction, where migrants and existing residents have a mutual influence on each other. In this process, community support can help increase migrants' intentions to take part in community governance progressively, and in return, community integration could be strengthened (Kayhan, 2015; Yang, 2015). Therefore, community integration should be a bridge between the improvement of migrants' economic conditions and the perception of their identity. That is.

H2c. Community integration enhances psychological integration.

As it is shown in Fig. 1, we propose the progressive development pathway of social integration of migrants in the PAR programs. The pathway of social integration of PAR migrants first goes through economic integration, the economic integration then affects the psychological integration via community integration.

3. Methodology

3.1. Empirical analysis strategies

Based on the theoretical ground of social integration theory, the study uses the structural equation modeling (SEM) method to test the hypotheses proposed in the previous section. We propose that social integration is a progressive process with different adaptation processes: economic integration comes first, followed by the support provided by the new community; migrants can then integrate into the new community after they find themselves integrated into it psychologically. The nature of the SEM fits into understanding the complexity of the economic, social, and psychological integration system for poverty alleviation migrants (Tang et al., 2022), based on SPSS17.0 and AMOS23.0 software.

Before using SEM to analyze the relationships between the latent variables (i.e., economic integration, community integration, and psychological integration), we follow the procedure of SEM application to first test the reliability and validity of the measurement data (Byrne, 2013). We first validate the measurement model (i.e., confirmation

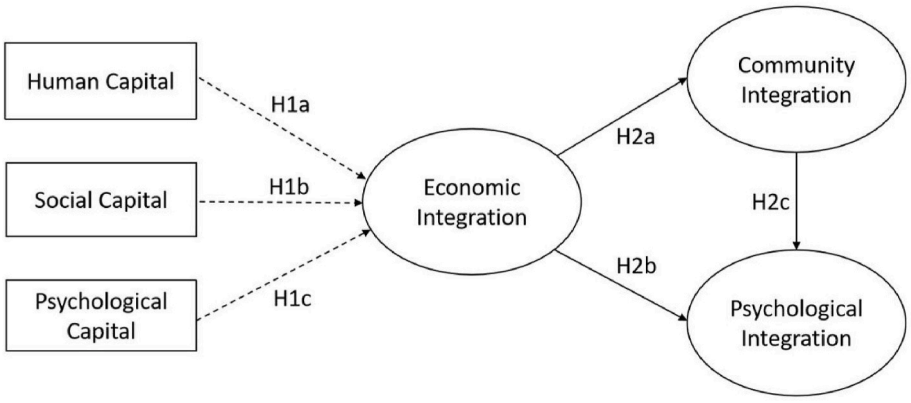


Fig. 1. Conceptual analysis framework of the study.

factor analysis (CFA)) to explore how the measurement variables represent constructs using the test criteria of Cronbach's alpha: a construct is valid if the value of Cronbach's alpha is greater than 0.6 (Hair et al., 2014). Also, we follow Hair et al. (2014) to use the principal component analysis (PCA) to analyze the interrelationship among variables and determine the constructs based on their similar underlying dimensions. Here, the Kaiser-Mayer-Olkin (KMO) is used to measure the sampling adequacy and verify the use of PCA: PCA should provide the factors with a KMO greater than 0.6 (Hair et al., 2014). We also test for the collinearity of latent variables (constructs) that ensure the SEM model has adequate explanatory power and the path of the SEM model is correct. Once the results of the above tests provide evidence of the reliability and validity of the measurement data, the constructs can then be used in the SEM model to explore the relationships between economic, community, and psychological integration in PAR migrants' social integration process.

3.2. Survey context

Mountains are important natural features that cover over a quarter of the earth's land surface and provide habitats for a variety of flora and fauna. FAO statistics showed that mountains are home to 15% of the world's population and host about half of the world's biodiversity hot spots. More than half of humanity relies on mountain freshwater for everyday life, family farming is the backbone of mountain economics and plays a key role in conserving agro-biodiversity and ensuring household food security (United Nations, 2019). Mountain regions are often characterized by high levels of poverty and inequality, as well as unique environmental and social challenges, such as remoteness, fragility, and marginalization. In terms of the significance of poverty alleviation work in mountain regions, there is broad agreement among scholars and policymakers that reducing poverty in these areas is crucial for achieving sustainable development and improving global well-being (Gioli et al., 2019; Peters et al., 2019).

Ninety percent of the population in mountainous areas is found in developing countries, with one-third located in China. The mountainous areas play a crucial role in the national sustainable development strategy in China. Yunnan province is a typical plateau mountainous area, with 94% of land areas being mountainous. As the most southwestern province in China, it shares a border of 4060 km with Myanmar in the west, Laos in the south, and Vietnam in the southeast. *Yunnan Statistical Yearbook* (2022) shows that the region maintains a strong agricultural focus: 51.2% of the population is in rural areas and agriculture contributes to 22.9% of its GDP. As one of the poorest provinces in China, Yunnan is on the radar of poverty alleviation of the central government. Under the framework of PAR, a total of 996,000 registered impoverished people in Yunnan have been relocated from 2016 to 2020, accounting for 10% of the total relocation number in China. The local government has built eleven resettlement sites accommodating over 10,000 people each, accounting for 21.6% of the total relocation scale in China (Xinhua News Agency, 2020). To support the integration of migrants into new communities, the central and local governments have invested in improving people's livelihoods by increasing their disposable income and providing jobs.

The current study focuses on Dongchuan, which is 150 km from the capital city of Kunming, Yunnan Province. Dongchuan District was one of the earliest regions to implement PAR, and its relocation project is the largest in Yunnan, with the highest urbanization resettlement rate. The relocation project started in 2009 when people were being moved from areas prone to geological disasters. By 2016, the relocation project for PAR had been officially launched. The urbanization resettlement rate is as high as 95.67%, with thirteen resettlement sites. The Duimenshan resettlement site is one of the two largest urbanization-concentrated resettlement sites with more than 10,000 people. By the end of 2018, a total of 9483 people from 2322 households in the townships of Tongdu Street, Tangdan Town, Yinmin Town, and Shekuan Town had been resettled to Duimenshan resettlement site, within a range of 1858 km^2. The project covers a total area of 103 acres and consists of twenty-one high-rise buildings with seventeen floors. This is a long-distance resettlement from rural to urban areas, which also faces greater challenges (Lo et al., 2016). As a demonstration project, the government has made a lot of work arrangements in resettlement plans, financial support, livelihood security, and other aspects.

The resettlement site has established a property management company to manage living arrangements. They use a "grid-based" method where one grid worker is assigned to every 300 households or 1000 resettled residents. The government has created social management and public service jobs in communities to guide employment. Public employment and entrepreneurship service offices have been established for every 800 or more immigrants. The government has also developed supporting industries, introduced enterprises, and built poverty alleviation workshops. The salaries are based on a "base salary + piece rate commission" model with a stable monthly income of 2000–4000 RMB (approximately 280–550 USD). A practical training base has been established that has effectively trained and recruited immigrants, organized labor exports, and supported independent entrepreneurship.

The resettlement site has achieved full coverage of medical insurance and invested 13.3 million RMB (approximately 1.88 million USD) in an activity square, kindergarten, primary school, and secondary school. Family and community excellence selection activities have been organized to foster residents' sense of belonging and identification with the community. The contracting right to contracted land will remain stable and unchanged for a long time under the law. Immigrants will also continue to enjoy subsidies for supporting and benefiting agriculture policies. However, they can revitalize the management rights of contracted land through self-management, trusteeship, proxy farming and planting, unified circulation and development of leading enterprises, the establishment of platform companies for unified operation, or pricing of contracted land management rights into professional cooperatives, or the government can offer compensation for the acquisition of collective property.

3.3. Survey design

We designed the survey questionnaire based on the social integration theory: 1) the level of economic integration is attributed to the dominant capital of human, social, and psychological capital; 2) the path of social integration is measured by economic, social, and psychological integration, following the progress of economic integration, community integration, and psychological integration. We first conducted a pilot survey to examine the appropriateness of the questions included in the survey: forty migrants were interviewed by the study's primary investigators. Based on the results of the pilot survey, an adjusted questionnaire was formed, with three sections: (1) personal and family information, such as gender, age, and education; (2) social adaptation statuses, such as income and work status, community evaluation, and participation in community affairs; (3) social integration cognition, such as work experience, social assistance, policy support, life attitude, and psychological status. Fifteen trained interviewers were sent out to interview 430 randomly selected migrants face-to-face at the Duimenshan resettlement site in July–Aug 2022, which produced 400 valid questionnaires.

3.4. Data and variables

In our sample, the average household size is 4.98, with an average annual income of 54,000 RMB, where 51.5% of households have an income level between 40,000 and 80,000 RMB, the income of immigrants primarily comes from non-agricultural wages, based on five years of employment placement work; About 54.5% of interviewees are males, and 81% of them are aged between 30 and 50 years old; most of the respondents only have an education level of primary school (68%). The

Dongchuan District has a permanent population of 257,700 people, most of whom are of Han ethnicity. However, there are also ethnic minorities such as Yi, Hui, Miao, and Buyi, who make up around 5% of the total population. Based on the community survey, it has been found that 94.2% of the residents in this area are Han Chinese. The demographic information about the sample data is shown in Appendix table 1. These are included as control variables in the SEM analysis, considering social integration is also dependent on the individual characteristics of migrants (McPherson and Smith-Lovin, 2002; Turner and Turner, 2013).

Table 1
The descriptive statistics of variables included in the empirical analysis.

Variable	Description (Scale item and description)	Measurement (5-point Likert scale)	Mean	S.E.
Human capital	HC1: working experience meets the job requirement	1 = strongly disagree	3.34	0.067
	HC2: professional knowledge gained from formal education satisfies the job needs	2 = disagree 3 = neutral 4 = agree 5 = strongly agree	3.13	0.084
	HC3: professional skill meets the job requirement		3.05	0
Social capital	SC1: Assistance to families from social networks	1 = none 2 = fewer	2.95	0.162
	SC2: Personal help from relatives and friends	3 = neutral 4 = more	3.10	0.131
	SC3: Assistance to families from the government	5 = too much	3.06	0.123
	SC4: Assistance to families from competent individuals		2.69	0
Psych-capital	PC1: resilience: able to self-adjust under the pressure of life	1 = strongly disagree 2 = disagree	3.99	0.112
	PC2: efficacy: seek solutions actively when encountering difficulties in urban life	3 = neutral 4 = agree 5 = strongly agree	4.07	0.107
	PC3: hope: full of hope in the future life		4.30	0.120
	PC4: optimism: acceptance of urban life optimistically and efforts to adapt		4.06	0
Economic integration	EI1: household income recognition compared with neighbors	1 = strongly dis-satisfaction 2 = dis-satisfaction 3 = neutral 4 = satisfaction 5 = strongly satisfaction	2.81	0
	EI2: satisfaction of household income individually		2.82	0.094
	EI3: household income savings		2.29	0.095
	EI4: salary satisfaction of jobs		2.98	0.091
	EI5: the overall economic situation		2.76	0.088
Community integration	CI1: participate in local cultural and sports activities	1 = never 2 = barely 3 = neutral 4 = often 5 = always	3.18	0.120
	CI2: participate in a community election		2.72	0.110
	CI3: use of community public facilities		2.41	0.110
	CI4: participate in various community organizations		2.61	0
Psych-integration	PI1: sense of belongs: you are a member of the local community	1 = strongly disagree 2 = disagree	3.70	0
	PI2: self-identity perception: you are a citizen of the new city/region.	3 = neutral 4 = agree 5 = strongly agree	3.26	0.345
	PI3: trust perception: the existing residents can be trusted		2.82	0.207

Table 1 shows the detailed descriptive statistics for the key factors used in building the six constructs (latent variables) to be used in the SEM. Five scores Likert-scale was used to measure the factors (observed variables), representing the perceived levels of economic, social, and psychological status. We choose a series of factors (all five score Likert-scale items) to evaluate each of the six constructs based on the existing studies (Junger-Tas, 2001; McPherson and Smith-Lovin, 2002; Judge, 2009; Brydsten et al., 2019; Gu and Yeung, 2020; Rogers et al., 2020; Qiu et al., 2021). For example, human capital is constructed by 3 observational variables of working experience, professional knowledge, and skills that the migrants need in the new community life (Junger-Tas, 2001), these are essential for migrants to gain a "normal" life via work that is mainly arranged by the local government (part of the PAR program).

4. Results and discussion

4.1. Results of reliability, validity, and collinearity test

We used Cronbach's Alpha value to measure data reliability and the KMO value of PCA to measure the validity of measurement data. As shown in Table 2, Cronbach's Alpha values of the six latent variables range from 0.694 to 0.818, and the Cronbach's Alpha value considering all six latent variables (23 observable variables) is estimated to 0.827, indicating the reliability of the data and the measurement indicators (Cronbach, 1951). The value of the KMO of PCA shows that the KMO value of the total model is 0.826, and the KMO values of the latent variables are all above 0.7, indicating a good fit (shown in Table 2). Note that the KMO value of Psychological Integration is 0.594 which can be seen as acceptable (Kaiser, 1974; Kim and Mueller, 1978; Sinex, 2005).

We apply PCA to test the validity of the sample data. Based on the theoretical framework, AMOS 23.0 is used to construct a structural equation model (Fig. 3). From the estimated standardized coefficients (shown in Table 3), the factor load coefficients of all observed variables corresponding to latent variables are above 0.5, mainly concentrated between 0.6 and 0.8. The results show that observed variables are credible: the standardized coefficients are all over 0.5. The interpretation of factor loadings in confirmatory factor analysis suggests that loadings greater than 0.5 are considered strong of the latent variables (Kline and Tamer, 2016; Hair et al., 2014), indicating that each observation variable has a high load on their respective principal component factors, and the data structure validity is good.

As shown in Fig. 2, the results of the collinearity test of the six constructs (the numbers shown beside the arrows) are between 0.15 and 0.43: most of the variables are moderately correlated, and no coefficient exceeds 0.85. The results indicate that there is no collinearity between the latent variables in this paper, and all the measured data meet the requirements of the model.

Based on the tests shown above, we conclude that all 23 observation variables present good reliability. The SEM model built on the theoretical framework and by applying PCA has a good fit with the actual survey data, and the sample data has validity. Lastly, the latent variables are related but have noncollinearity. Hence, we proceed with the next step to evaluate the SEM model and investigate the coefficients estimated by the model.

Table 2
Reliability and validity test of latent variables.

Variable	Cronbach's Alpha	KMO
Human capital	0.811	0.702
Social capital	0.735	0.734
Psych-capital	0.772	0.780
Economic integration	0.818	0.819
Community integration	0.715	0.709
Psych-integration	0.694	0.594

Table 3
Estimated measurement model of the SEM for social integration.

Variables			Estimate[a]	S.E.	C.R.	P-value[b]	Estimates[c]
HC	→	EI	0.238	0.038	6.339	***	0.375
SC	→	EI	0.403	0.065	6.158	***	0.434
PC	→	EI	0.152	0.056	2.706	***	0.151
EI	→	CI	0.543	0.099	5.482	***	0.378
EI	→	PI	0.187	0.053	3.551	***	0.250
CI	→	PI	0.106	0.038	2.796	***	0.203
HC	→	HC1	0.872	0.067	13.002	***	0.740
HC	→	HC2	1.128	0.084	13.416	***	0.848
HC	→	HC3	1.000				0.726
SC	→	SC1	1.462	0.162	9.040	***	0.764
SC	→	SC2	1.153	0.131	8.812	***	0.692
SC	→	SC3	0.983	0.123	8.019	***	0.577
SC	→	SC4	1.000				0.539
PC	→	PC1	1.240	0.112	11.025	***	0.728
PC	→	PC2	1.186	0.107	11.127	***	0.745
PC	→	PC3	1.161	0.120	9.645	***	0.598
PC	→	PC4	1.000				0.668
EI	→	EI1	1.000				0.737
EI	→	EI2	1.133	0.094	12.063	***	0.669
EI	→	EI3	1.058	0.095	11.173	***	0.617
EI	→	EI4	1.019	0.091	11.161	***	0.616
EI	→	EI5	1.177	0.088	13.348	***	0.750
CI	→	CI1	0.948	0.120	7.879	***	0.514
CI	→	CI2	1.001	0.110	9.126	***	0.638
CI	→	CI3	1.038	0.110	9.427	***	0.690
CI	→	CI4	1.000				0.648
PI	→	PI1	1.000				0.518
PI	→	PI2	2.733	0.345	7.919	***	0.910
PI	→	PI3	1.787	0.207	8.631	***	0.606

Note: [a.] Regression weights; [b.]*** indicates 1% significance level; [c.] Standardized regression weights.

4.2. SEM evaluation results

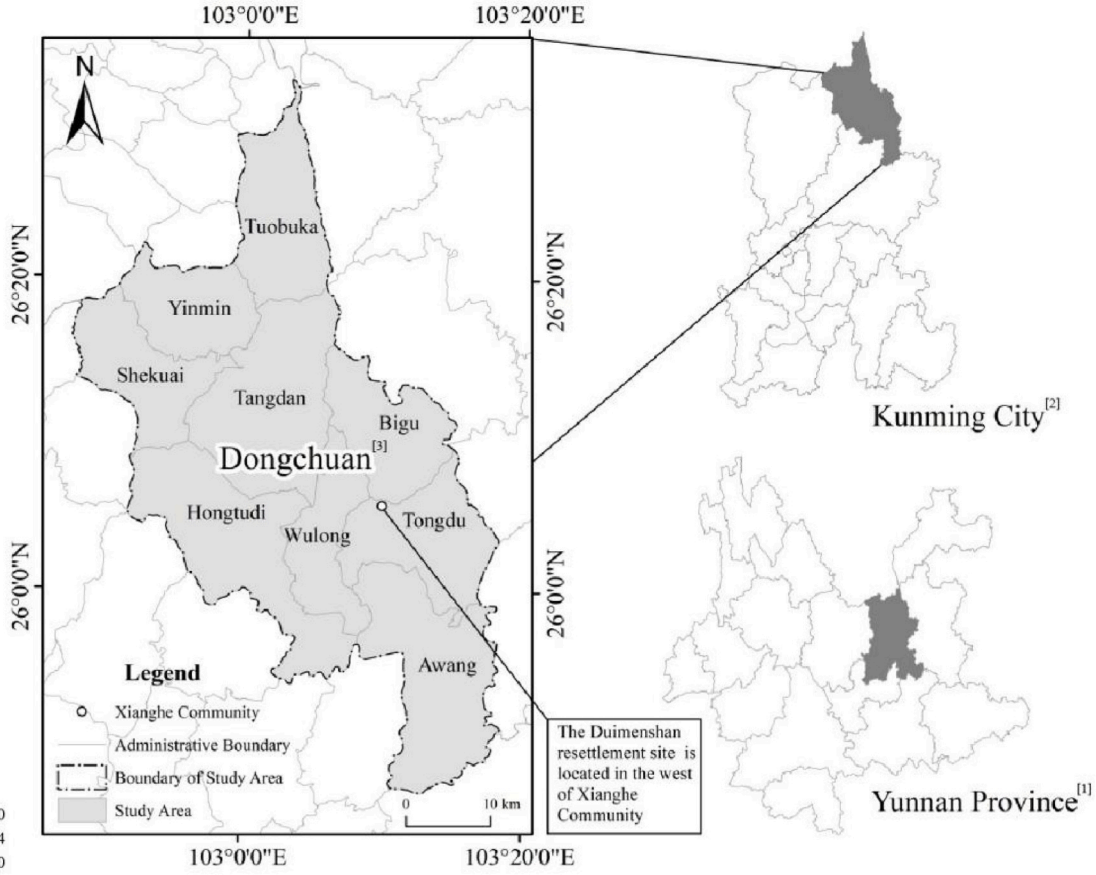
Model fitness is a necessary condition for conducting SEM analysis, as fitness is the degree of consistency between the expected covariance matrix estimated by the model and the sample covariance matrix. The better the fitness, the more consistent the model is with the sample (Byrne, 2009). According to the multivariate indicators shown in Table 4, the results of the model evaluation index show that the SEM model of the study meets the model judgment criteria (Byrne, 2009; Hair et al., 2014; Kline, 2016). These results show that the SEM model is a good fit. Furthermore, the values of the complex correlation coefficient between the latent variables are found to be significant at a 1% significance level, indicating the overall explanatory power of the SEM model is good (see Table 4).

4.2.1. Path coefficient estimates of the SEM

Based on the path coefficient estimates (shown in Table 5), the six hypotheses proposed by the SEM model are supported through validation and all reached a significant level of 1%.

4.2.2. Dominant capitals enhance economic integration

Based on the results shown in Table 5, we find that dominant capitals enhance economic integration in three ways: human capital, social capital, and psychological capital have a positive impact on economic integration (H1 is supported). Note that social capital is found to have the greatest impact on the economic integration of poverty-alleviation migrants, followed by human capital and psychological capital (H1a-H1c). That is, PAR migrants benefit the most from the assistance of social networks. This finding aligns with the existing studies that indicate a positive income effect of social support: having strong social connections and networks can positively impact households' income (Lu et al., 2013;



[1] Drawing Approval No. Yun S(2023)40
[2] Drawing Approval No. Yun S(2023)84
[3] Drawing Approval No. Yun S(2023)90

Fig. 2. The map of the Duimenshan resettlement site in Dongchuan District, Kunming City, Yunnan Province.

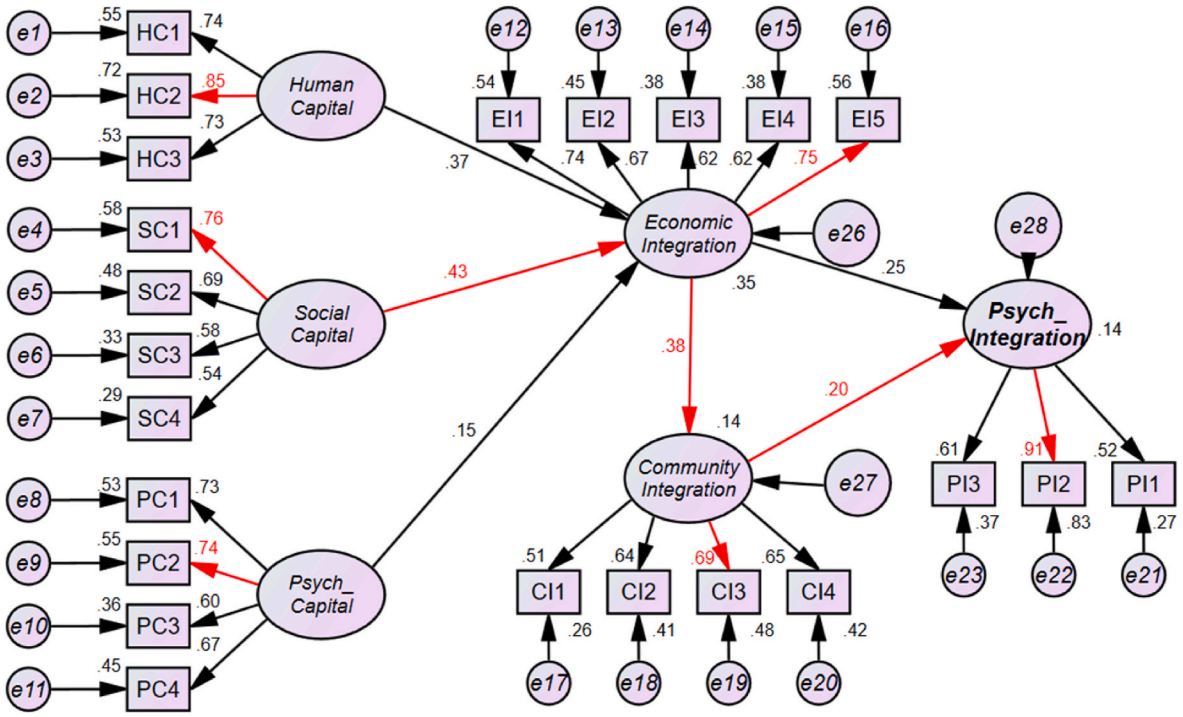


Fig. 3. The path coefficient of the model fit index and fitting results.

Table 4
Evaluation criteria and fitting results of the SEM model.

Model evaluation index	Criteria	Model fitting results
CMIN/df	<3 good fit <5 reasonable fit	3.303
SRMR	<0.05 good fit <0.10 reasonable fit	0.105
RMSEA	<0.06 good fit <0.08 reasonable fit	0.076
GFI[a]	>0.90	0.865
PGFI	>0.5	0.702
PNFI	>0.5	0.686
PCFI	>0.5	0.734
AGFI	>0.8	0.833
NFI	>0.90	0.807

Note: [a] it is suggested by the literature that the value of GFI greater than 0.9 shows a good fit. Our result (0.865) is close to 0.9 and can be seen as a reasonable fit.

Table 5
The path coefficient estimates result for the support of the hypotheses.

Hypothesis	Path	Coefficient estimate	S.E.	C.R.	P	Conclusion
H1a	HC→EI	0.375	0.038	6.339	***	Supported
H1b	SC→EI	0.434	0.065	6.158	***	Supported
H1c	PC→EI	0.151	0.056	2.706	***	Supported
H2a	EI→CI	0.378	0.099	5.482	***	Supported
H2b	EI→PI	0.250	0.053	3.551	***	Supported
H2c	CI→PI	0.203	0.038	2.796	***	Supported

Yan et al., 2019). Note that this finding is different from the results of some other studies that psychological capital is the most important in social integration (Cole, 2006; Li et al., 2011; Van de Rijt, 2014), which is mainly due to the difference between migrant groups. Here, migrants from the plateau mountainous areas are under extreme poverty and willing to relocate whilst migrant groups targeted in the above studies are forced to relocate by natural disasters or centralized relocation policy. When having a closing look at the factor loadings in forming the social capital (shown in Fig. 2), the results show that the most influential social factor is from the relatives and close friends (SC1), and community members (SC2) also help build migrants' social capital in the social integration process; though positive, the social impact of support from the government (SC3) and competent individuals (SC4) is relatively weaker than that of close friends (SC1) and community members (SC2). These findings echo the literature on social network impact on individuals and households that larger income returns on social capital (Letki and Mieriņa, 2015; Liang, 2016), particularly on social capital derived from strong ties, in our case the closest relatives and friends. In addition, the support of community members also plays an important role in economic integration where engagements with community members may help migrants to get familiar with, adapt to the new community, and reduce their financial stress and employment difficulties (Wong and Leung, 2008).

The positive impact of human capital on economic integration is consistent with the results of existing studies that human capital could improve economic situations in various ways, such as increasing income and working opportunities and reducing economic inequity (Li et al., 2011; Van de Rijt, 2014). Here, professional knowledge gained from formal education (HC2) ranks the first impact factors on human capital in the social integration process. This finding reflects the educational level of the sample data, where about 68% of the interviewees only went to primary school. The recognition of educational knowledge by respondents is a core indicator of human capital (Blundell et al., 1999). Thus, it is important to address the knowledge gap between what migrants have and what is expected from the job market by offering training (Blundell et al., 1999; Hendarman and Cantner, 2018).

The positive impact of psychological capital on economic integration indicates the link between the key components of psychological capital and migrants' capabilities. Developing and sustaining psychological capital could benefit migrants regarding the improvement of competitive advantages that could further improve social integration (Cole, 2006; Luthans et al., 2007; Weiss et al., 2020). Specifically, efficiency (PC2, i.e., to actively and effectively solve life difficulties) and resilience (PC1) in dealing with an unfamiliar environment are the most important

psychological capital for migrants to integrate into a new community. This finding confirms the sequential relationship of the four key components of psychological capital (Luthans et al., 2006, 2007) that the impact of efficacy is greater than that of resilience, optimism, and hope in psychological capital.

4.2.3. Economic integration, community integration, and psychological integration

The results of the path coefficient analysis shown in Table 5 support H2a and H2c: being the first step in social integration, economic integration helps PAR migrants to adapt to and become members of the new community with the preparation of economic and financial confidence. As for the path from economic integration to community integration, an increase in income may help reduce the income gap between the migrants and local community members (Lu et al., 2013; Zhang, 2018), and hence facilitate their interactions and communications. Besides supporting social connections, economic integration could also increase migrants' confidence in positioning themselves in the new community: migrants may gain self-esteem and positive self-assessment through the increase in income and success in obtaining new jobs (Chase-Lansdale et al., 2019; Taylor et al., 2011). In addition, there is a positive link between community integration and psychological integration. As expected, migrants may perceive the acceptance from the new community with the participation in community activities and events (García-Ramírez et al., 2011). Building social networks and connections with local community members helps migrants to feel a place attachment (Zhu et al., 2021): rather than seeing themselves as outsiders, they may perceive themselves as new members of the community.

The path coefficient analysis of SEM shown in Fig. 2 and Table 5 confirms the positive mediating role of community integration in the relationship between economic integration and psychological integration (H2 is supported). Here, the path coefficients representing the relationships between economic integration, community integration (EI → CI), and psychological integration (EI → PI) are positive (0.378 and 0.25) and significant at a 1% significance level; also, the coefficient for the path from community integration to psychological integration is positive (0.203) and significant. Hence, the positive mediating effect of community integration adds to the direct effect of economic integration on psychological integration, making a total effect of 0.58. This finding is consistent with the existing studies addressing the impact of community support in transitioning migrants from adapting into the society economically to make them a member of the society psychologically (Gu and Yeung, 2020; Lin et al., 2020; Lu et al., 2013).

5. Conclusion

Built on the theory of social integration, the study used a structure equation modeling framework to examine the path of social integration of migrants in the poverty alleviation relocation in China. The study is the first to consider the process of social integration by considering the progress of integration as economic integration, community integration, and finally psychological integration. Our results show the evidence that economic integration is the starting point of migrants' social integration and community support, and social networks can further help transform economic integration into psychological integration in that migrants see themselves as members of the new community. This clarifies a new idea for the integration process in many integration paths.

This study positioned the theory of social integration in plateau mountainous areas and strengthened the regional nature of post-relocation research, namely the social adaptation path of rural migrants in plateau mountainous areas. Notably, the role of social capital in the integration process is more prominent than other dominant capitals. Different from engineering construction, natural disasters, and the relocation of rural-urban migrant workers in China's mega-cities, most migrants from plateau mountainous areas have positive attitudes toward PAR – psychologically, they support PAR. Hence, social capital gained through local support and social networks could help them adapt to the new community effectively. Hence, this finding suggests that post-PAR evaluation needs to consider both regional differences suggested by the existing studies (e.g., Liu et al., 2023; Zhang et al., 2022; Zhu et al., 2021) and the heterogeneity of migrant groups. For example, those relocated due to engineering construction and natural disasters may not have a natural acceptance or support for PAR, and hence, psychological capital may play a more important role in assisting in social integration (Jacobs and Almeida, 2021; Kirchherr et al., 2019; Yang et al., 2020); migrants from plateau mountainous areas are willing to relocate and accept the help from the PAR program to improve living conditions, where social capital seems to be the most important. Therefore, policymakers should consider group heterogeneity to provide different support for PAR programs and resettling sites and satisfy the needs of the migrants based on dominant capitals.

While validating the key components of social integration, our results also presented the path of social integration via the progress of economic integration, community integration, and psychological integration. Being the first milestone in social integration, successful economic integration helps migrants improve economic conditions (e.g., via job success (Hooper et al., 2017)) and reduce the income divide between migrants and residents (Liu et al., 2023): all together build migrants' confidence in engaging in local community. In addition, social support from community integration has an add-on effect on the positive link between economic integration and psychological integration. This finding provides theoretical support for the transitional integration work of poverty alleviation immigrants in mountainous areas, from the perspective of social integration.

Given the important bridging role of community integration, policymakers should consider facilitating social engagement between migrants and residents to help migrants participate in public events and activities of the local community. On top of improving living standards, taking part in building the local community is a catalyst to promote migrants' recognition of resident identity and obtain the place attachment (Tang et al., 2022; Zhu et al., 2021).

The results and findings of the study also provide valuable policy implications that can guide effective integration and support strategies for immigrant communities. Policymakers should focus on integrating immigrants into the local public employment service system by creating employment opportunities that align with local resources and industrial development. This includes establishing diverse employment positions to accommodate immigrants of varying age groups, education levels, and skill levels. Additionally, organizing employment training, facilitating labor export, and implementing employment resettlement systematically can help immigrants adapt and thrive in the local job market. Support for immigrant entrepreneurship can stimulate economic growth and foster a sense of community belonging by providing financial incentives, business development training, and access to local markets and networks. Local community organizations should play a crucial role in promoting the integration of resettlement areas by improving essential services such as education and healthcare, enhancing supporting infrastructure, and increasing community public activities. Offering psychological support and social services tailored to the needs of immigrants, such as counseling, social integration programs, and community-building activities, can significantly improve their well-being. Furthermore, involving immigrants in the policymaking process through regular consultations, surveys, and advisory committees can ensure their needs and perspectives are adequately represented. By implementing these targeted support measures, policymakers can effectively address the diverse needs of immigrants, facilitate their integration, and enhance their overall well-being and contribution to the community.

This study comes with several limitations. First, the study methodology is based on quantitative design and econometric analysis methods, and it lacks qualitative information about the poverty alleviation migrants, such as heterogeneous groups, marginalization, and imbalanced

rights. Social integration is a process of mutual adaptation between different individuals, groups, or cultures. The social integration process of relocated poverty alleviation migrants in resettlement sites is also complex and differs across regions and provinces Second, the case Dongchuan we chose has been a relatively successful PAR amongst Yunnan and the whole country and it has its special characteristics. For example, most of the migrants were willing to relocate (they are moving from extremely poor areas to a well-structured and designed PAR site) and hence supported the policy and actions implemented by the regional government. The migrants have a positive attitude toward the pre- and post-PAR process, making the social integration, including economic, community, and psychological integration (with high psychological capital) develop smoothly and successfully. The pathway of social integration may not fit other contexts of PAR. Third, the SEM suffers from subjectivity in model setting, potential bias in selectivity, and limitations in hypothetical real-world references. Though the questions used in building latent variables were based on the whole period of PAR, certain dynamic effects or progressive changes in the integration process may not be observed and captured in the SEM model.

Given the limitations mentioned above, future studies may consider extending the study of the social integration of PAR from the following aspects. Qualitative methods of data collection and analysis could be considered in parallel with the quantitative methodology to provide a more in-depth understanding of social integration. Method-wide speaking, researchers may consider using a multi-disciplinary research design, including economics and sociological methods, to evaluate the process of post-PAR. In addition, the study is based on the empirical analysis of a cross-sectional sample, where the migrants have resettled for less than five years. Future studies may consider gathering multi-year sample data to verify the conceptual analysis framework developed in this study. Lastly, only one resettlement site in Yunnan is included as a typical example representing PAR programs in plateau mountainous areas. Future studies may consider gathering more information from the resettlement sites of other regions in China to provide a more general and representative conclusion about the social integration process.

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CRediT authorship contribution statement

Lu Feng: Writing – review & editing, Writing – original draft, Project administration, Funding acquisition, Formal analysis, Conceptualization. **Wei Yang:** Writing – review & editing, Validation, Methodology. **Jianhui Yun:** Investigation, Formal analysis, Data curation. **Yan Zhang:** Methodology.

Declaration of competing interest

The authors declare that we have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. All authors have read and agreed to the published version of the manuscript.

Data availability

The data that has been used is confidential.

Appendix

Appendix Table 1
Characteristics of the Sample Surveyed Household

		percentage			percentage
Age	≤30	3.75	Education	≤primary	68
	≤40	34.75		≤secondary	19.5
	≤50	46.25		≤senior	7.5
	≤80	15.25		≤college	5
Household size	≤3	11.25	Annual income	≤ ¥ 40000	30.25
	≤5	54.5		≤ ¥ 80000	51.5
	≤8	33		≤ ¥ 100000	15.5
	≤10	1.25		≤ ¥ 130000	2.75
Gender	Male	54.5	Monthly expenditure	≤ ¥ 1000	2.75
				≤ ¥ 2500	47.5
	female	45.5		≤ ¥ 4000	42.5
				≤ ¥ 5500	7.25
Ethnicity	Han	94.2			
	Yi	3.2			
	Hui	2.1			
	Miao	0.3			
	Buyi	0.2			

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