

# **Subsidized Relocation and the Willingness to Move: Evidence from the Targeted Poverty Alleviation Project in China**

## **Abstract**

Relocation has been employed to tackle varieties of social problems. Nevertheless, the willingness towards relocation and its impact on the subsequent actions movers will take remain unclear. This study aims at examining the determinants underlying the relocation decision-making process and the mover's return frequency after relocation. Using data from a two-wave survey conducted in 2016 and 2017 from the participants in the Targeted Poverty Alleviation Project in China, we found that households with larger land holdings were less likely to relocate; on the contrary, the distance to paved roads and educational institutions serve as push factors that increased the probability of relocation. The frequency of returning to the place of origin was associated with left-behind family members and livestock values, whereas time consumption in returning will significantly decrease the return frequency. Combined together, the preliminary results demonstrate two different pathways naturally embedded in the relocation process that could determine the actual policy effectiveness.

## **Introduction**

Relocation has been in existence for a long time in multiple contexts for different purposes. In nomadic civilizations, people relocate frequently to more suitable environment for surviving; in pre-industrial societies, relocation was applied in order to support the development of certain industrial cities; more recently, relocation projects have been connected with city development (Chaskin 2013; Gibson 2007; Johnson and Hurter 1999; Jourdan et al. 2013; Kleinhans and Kearns 2013, 2013), poverty reduction (Cernea 1993; Fuwa 2011; Goetz 2002; Li, Su, and Liu 2016; Li, Yin, and Liu 2011; Wu et al. 2016; Zeng et al. 2015) and climate changes (Maldonado 2014; Maldonado, Colombi, and Pandya 2014; McNamara and Des Combes 2015).

Although pursued in numerous other countries as well (Cernea, 2006, 2007), the magnitude and impact of China's relocation program are unprecedented (Wu, 2015, 2016). For instance, the construction of Three Gorges Dam relocated 1.3 million people out of the reservoir (Hwang et al., 2011). China's relocation projects were recognized by the World Bank, and some of its experience was set as models for other developing countries (Bartolome et al. 2000). In 2016, Chinese Government initiated a national project, Targeted Poverty Alleviation Project (TPAP), aiming at lifting its 55 million population out of poverty by the end of 2020 (Chinese Academy of Fiscal Sciences Ministry of Finance, 2016). One of the many approaches to achieving the ambitious goal is to relocate households in resource-constrained and ecologically-vulnerable areas to settlements that are close to markets and could afford more job opportunities. This practice gives us an opportunity to test hypotheses considering the determinants within relocation decision-making process in terms of initial relocation willingness before relocation and return frequency after relocation.

We will fit two logistic regression models. In the first model, the dependent variable is the willingness towards relocation. In the second model, the dependent variable is the movers' return frequency. The independent variables include household

characteristics, educational resources, social support, and community amenity. This study will contribute new evidence to the literature on migration and residential preferences by studying China's unprecedented subsidized relocation program. Furthermore, subsidized relocation has gained increasing attention recently, primarily because of climate change. However, not enough attention has been drawn to the decision-making process and its determinants. By virtue of China's unprecedented social project, we could shed light on those understudied areas and enrich migration/relocation theory along with the scope of its application.

This article has five main sections. Followed the introduction, we revisit the previous approach towards relocation studies and introduce the migration system approach on which we build our framework. The second section is the literature review. Then we introduce the Targeted Poverty Alleviation Project briefly. The fourth section is about our data source, sampling strategies, and statistical methods. We then report the preliminary results of our two models. Finally, we close this article with summary and discussion.

## **A Theoretical Revisit and the Migration System Approach**

Relocation, by its nature, inevitably incurs spatial displacement from one place to another. Yet, there is no clear definition of relocation in academia and bureaucracy, like HUD (The United States Department of Housing and Urban Development), the institution that funded many relocation programs in the United States. However, the United Nations High Commissioner for Refugees (UNHCR) and other scholars have been using relocation, migration, and displacement interchangeably (Guterres 2012; Marino 2012; De Sherbinin et al. 2011; Sluzki 1992) to depict the process of population flow, either voluntarily or was forced to do so. In keeping with these works, we adopt the migration perspective to frame the process of relocation and will use migration and relocation interchangeably as previous studies did in this study.

In the recent years, there has been an increasing passion on the study of migration and its modern developments from academia and policy arena (de Haas, 2010). To sum up, there are push-pull theory, neoclassical economics, new economics of labor migration, and migration systems theory in explaining the first, repeat, and return migration.

### ***Push-Pull (P-P) theory***

It has been more than one hundred years since E. G. Ravenstein, a geographer, published his three pioneering papers, illustrating his "laws"<sup>1</sup> of migration. By exacting and analyzing data from printed tables from the 1871 and 1881 British Censuses, Ravenstein proposed his seven hypotheses within internal and international migration in Britain (Ravenstein 1885). In the following three-quarters of a century, Ravenstein has been frequently quoted and occasionally challenged. Yet, within the thousands of migration studies at Ravenstein's time, "few additional generalizations have been advanced" (Lee, 1966:48). However, in the last decades of the twentieth century, as migration, both internally and internationally, became increasingly common (or at least more visible) and

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<sup>1</sup> One thing worth noting is that once Ravenstein introduced his seven laws of migration, there was a concern from two audiences with the term "laws" in social science. Ravenstein himself explained that he used the laws to demonstrate that there are certain rules in the migration process, rather than referring to physical laws (Ravenstein, 1885:235).

more datasets were available, attempts to test Ravenstein's migration laws increase accordingly. Grigg quoted subsequent works on migration in the nineteenth century, finding out that most of Ravenstein's migration laws stand the test of time. But he indicated that the defects of the Census data at that time impede the proper understanding of migration back then (Grigg 1977). Alexander and Steidl also point out that the data issues affect the validity of Ravenstein's migration laws. In particular, they argue that in the dataset on which Ravenstein builds his study, "women were over-represented among internal migrants, but under-represented among international migrants" (Alexander & Steidl, 2012:229). That being said, his assertion that women are more migratory than men could be biased. Another crucial criticism towards push-pull theory contends that it has difficulty in explaining return migration (de Haas, Fokkema, and Fihri 2015).

### ***Neoclassical Economics (NE) and New Economics of Labor Migration (NELM)***

Unlike push-pull theory which emphasizes a battery of factors that determine the migration decision-making process, Neoclassical Economics (NE) insists that migration process can be reduced to individual's cost-benefit calculation (Todaro, 1969; Todaro & Maruszko, 1987). NE posits that the markets both at the sending end and the destination end are well functioning but in different stages of development. Migrants flow to geographically distinct labor markets to maximize their income (Massey & Espinosa, 1997). As to return migration, NE tends to interpret it as the outcome of failure, primarily with respect to the economic condition, in the destination. It is under this scenario that de Haas et al. considered NE's approach as "income or utility-maximizing behavior by individuals" (de Haas et al., 2015:417).

In response to NE's narrow focus on wage differentials in the markets at places of origins and destinations, Stark and colleagues developed the New Economics of Labor Migration (NELM) theory. Stark and Levhari argue that migration is not only driven by the goal of increasing income levels, but also minimizing income risk or variability. Thus, they introduced risk into the migration decision-making process (Stark and Levhari 1982). In the following studies, Stark began enlarging the view to "wider social entities and interaction within them" (Stark & Bloom, 1985:173) and the relative deprivation in less developed countries (LDCs) (Stark and Taylor 1989), finding that migration occurs not only for higher earnings, but also to avoid market failure in the places of origin and to accumulate human capital in the place of destination (Massey & Espinosa, 1997). In this view, NELM intrinsically resonates with Social Capital approach (Massey 1990; Reichert 1981) and World System theory (Wallerstein 1974), which focus respectively on human capital formation and the unbalanced global market economy in conditioning migration, specifically, the international migration from LDCs to developed countries.

From NE to NELM, the focus was shifted from individual actors to larger units, "typically families or household", because households have advantages in controlling risk by diversifying resources in the forms of savings and workforces within the family (Massey et al., 1998:21). Massey and Espinosa use a longitudinal data from 25 Mexican communities to test the validity of NE indicators and NELM indicators, coming to the conclusion that NELM variables are better indicators in explaining the very first, repeat and return migration (Massey & Espinosa, 1997). Whereas de Haas et al. draw on survey data from Moroccan migrants to investigate their main determinants of return intention, finding that neither NE nor NELM could explain the return migration on their own, therefore they are partly complementary (de Haas et al. 2015).

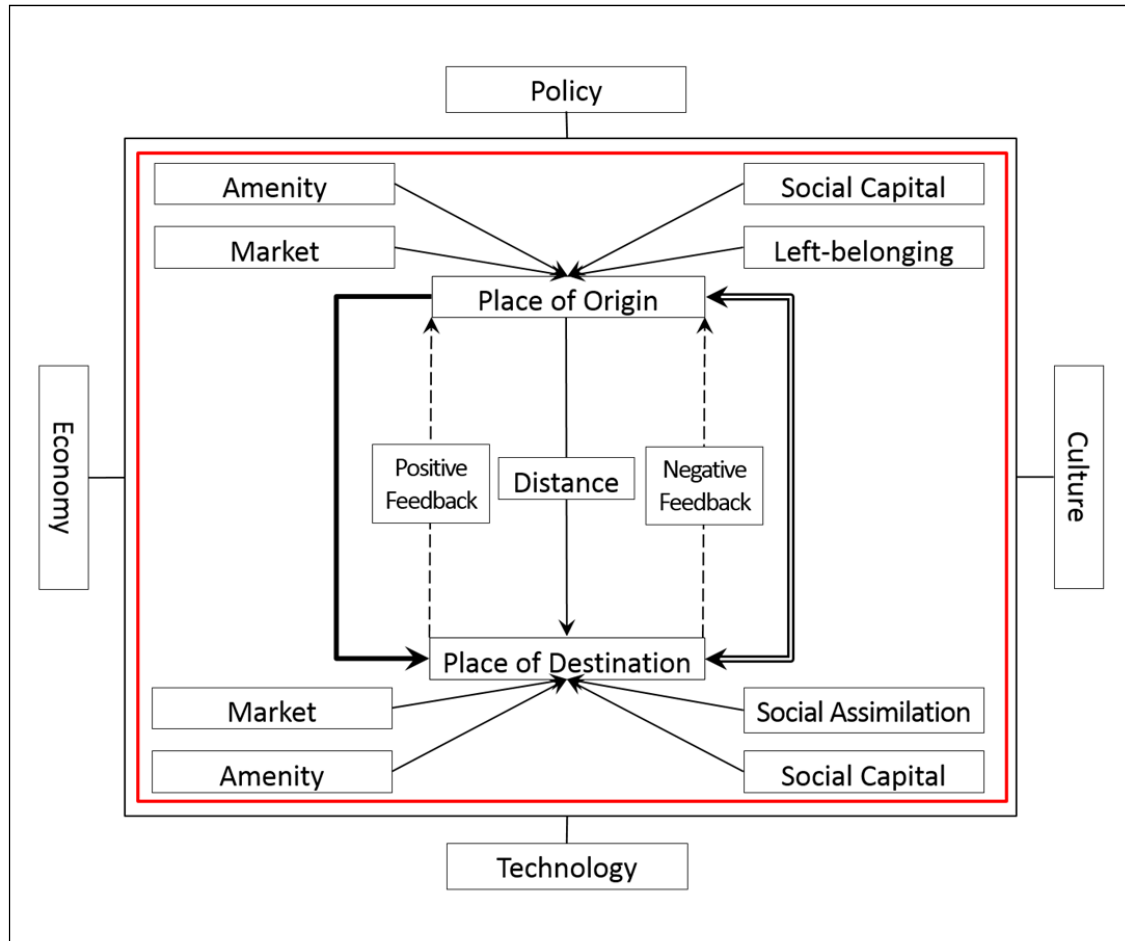
### ***Migration System approach***

All the above theoretical frameworks focus on either structural factors or the agency of actors. For instance, Push-Pull theory, NELM, and especially the World System approach strengthen the social structural differences in places of origins and destination that initialize the population flow, whereas NE and Social Capital emphasize more on the social actors' desire to achieve economic growth and prosperity, or accumulate social capital for the same reason. There is little endeavor that had been given to the dynamics between structural constraints and the individuals' agency (Bakewell, 2014; de Haas, Fokkema, & Fihri, 2015). Although in a recent study, Massey discovered that there exists a long-neglected mechanism which are socio-political dynamics in molding the Mexico-U.S. migration (Massey, 2015), more work should be done in theorizing and practicing the internal dynamics and feedback mechanism within migration process.

Migration system is the approach trying to incorporate elements within migration from a broader context. In the second half of the twentieth century when the General System Theory (Bertalanffy 1950) and structural-functionalism were dominant perspectives, Mabogunje developed the migration system approach by referring to system theory and structural-functionalist. He argues that traditional theoretical models have difficulties in capturing the dynamics and spatial impact embedded in the migration process. From the system perspective, he incorporated the basic interacting elements, their attributes, their relationships, along with the environment in which the migration takes place into one theoretical framework, the migration system approach (Mabogunje 1970). The crucial advances brought forward by the migration approach are that (1) it recognizes, at least theoretically, the role of feedback that shaping the migration process, especially the subsequent migration patterns after the initial movement (Bakewell 2014), and (2) it bridges the micro-macro gap by filling it up with the interactions and feedback mechanisms between social actors and the broader environment (Cooke and Bélanger 2006). However, as general system theory and structural-functionalism were widely discredited at the end of the twentieth century, the migration system approach was challenged as well because of its close relationship with the two theories. Until recent decades, much work has been done to remodel the system approach, including the introduction of "emergence of systemic linkage" (O. Bakewell, de Haas, & Kubal, 2012:414) between former and latter movement, "causality and agency" (O. Bakewell, 2014:301). Although with these conceptual refinements, empirical studies need to be done to identify the internal dynamics and feedback mechanisms that determine the initial movement and return migration (Bakewell, 2014).

Figure 1 illustrates the migration flow from the migration system approach. At the macro level, the policy, the economic development, the cultural system, and technology are functioning in their own ways in shaping the migration process; at the meso level, there are distance, community characteristics that will influence the migration decision-making. Ideally, from the migrants' angle, if the pros outweigh the cons, socially, emotionally, and/or economically, there would be constant population flows from the places of origin to destinations. On the contrary, if the feedback from the destination is negative, there might be in-flow population and counter stream of migrants coexist in between the two ends. Specifically, in this study, we will be just focusing on the inner cycle within the red box. By viewing the migration as an internally and externally

interacting system, this framework has answered how the migration initiated on the one hand, and what perpetuated or suspend the migration on the other hand.



**Figure 1.** Theoretical Framework

We will employ the migration system approach, incorporating social, economic, environmental and political elements into our research scheme to examine the determinants of the initial and return migration and the linkage between them. We used “linked samples” (Schoorl et al., 2000) for this research, meaning we tracked the same group of people before and after their relocation and asked questions accordingly based on their relocation status. This gives us the opportunity to investigate the dynamics within the whole relocation process. In particular, the inclusion of initial moving willingness and other variables representing their conditions in both places of origin and destination in the return frequency model allows us to link their first experience to their return practice, illuminating the feedback mechanism.

### Literature Review

Relocation has been employed to tackle varieties of social problems, like employment insecurity, concentrated poverty, and climate change in the recent years. Typically, it comes with subsidy for the participants in those programs are usually vulnerable groups

who are incapable of moving without assistance. As such, some authors call these programs assisted labor mobility (Beaumont, 1976a), managed relocation (Richardson et al. 2009), subsidized relocation (Beaumont, 1976b). Table 1 shows the main subsidized programs that took place and continued existing around the world.

In general, developed countries, like the United States, Britain, and France, the purposes of subsidized relocation are to secure working opportunities among poor households, to rebuild and develop the community. While for tropical countries, like Brazil, the relocation programs are aiming at preventing traditional agricultural activities and industry from encroaching the natural resources. China's implementation of relocation programs results from infrastructure construction projects, poverty reduction, and environmental restoration. And it is clear that China's relocation programs outweigh all the other actions in pace and magnitude. For instance, the Three Gorges Dam along relocated 6 million people in less than ten years (Gleick & Cooley, 2009:145).

**Table 1: Comparisons between government-driven relocation programs around the world (ordered by the initiating year)**

Country	Program/Year	Population Involved	Purposes	Reference Details
U.S.	Mississippi Labor Mobility Project (MLMP) 1966-1972	2,500 individuals and their families	Employment security	Charles F. Mueller, 1981
Britain	Resettlement/Employment Transfer Scheme (ETS) 1966-1973 <sup>2</sup>	68,166 workers	Employment security	Beaumont, 1976a
U.S.	Housing Opportunities for People Everywhere (HOPE VI) 1992-present <sup>3</sup>	unknown	Poverty deconcentration and community reconstruction	Popkin et al., 2004
U.S.	Move To Opportunity (MTO) 1994-1998	4,604 households	Poverty deconcentration and community reconstruction	Ludwig et al., 2013
China	Three Gorges Dam (TGD) 1994-2003	6 million people	Integrated water project	Gleick & Cooley, 2009
Brazil	Rural Settlement and Agrarian Reform Program (RSARP) 1995-2010 <sup>4</sup>	924,263 households	Agrarian reform and forest restoration	Peres & Schneider, 2012

<sup>2</sup> In April 1972, the Employment Transfer Scheme was developed to supersede the Resettlement Transfer Scheme. From July 1966 to April 1973, 68,166 workers were relocated under the two successive programs (Beaumont, 1976).

<sup>3</sup> To our knowledge, HOPE VI is still in operation, so it is hard to know the exact population involved. What is more, most of the existing research calculate the attendants neither at the individual level nor at the household level; instead, they concern the units that were demolished for redevelopment. For example, in a report after one decade of the implementation of HOPE VI, Popkin et al., estimated that 63,100 distressed units have been tore down and another 20,300 units were redeveloped (Popkin et al., 2004:2).

France	National Urban Renewal Program (NURP) 2003-2011	100 000 households	Urban renewal and development	Lelevrier, 2013
China	Targeted Poverty Alleviation Project (TPAP) 2016-2020	70.17 million population	Poverty reduction and environmental restoration	Li et al., 2016

Other than the government-driven relocation programs that moving people or households in a massive way, there exist self-driven relocation/migration at the individual level, and the research focus varies across the two categories. In this section, we briefly review the previous studies on the two relocation patterns, respectively.

### ***Government-driven relocation***

As policy scheme, government-driven relocation projects inevitably trigger the interest of assessing their effectiveness and impacts on the participants. Yet, attitudes toward the relocation programs vary across the previous studies.

Through direct comparison between movers/leavers and non-movers/stayers in terms of their private and social benefit-cost ratios in MLMP, Black et al. concluded that relocation of the poor could be “a good social investment” (Black et al., 1975:77). In response to this contention, Beaumont argues that Black et al.’s study did not distinguish the net effect of MLMP from those movers who would have moved in the absence of the financial incentive. What is more, the population who will relocate anyway share the same personalities: single, young (under 30 years old), and skilled. That is to say, there is selection bias that weakens the conclusion arrived by Black et al.’s research (P. B. Beaumont 1977). Goetz made a comprehensive comparison between voluntary relocation and involuntary relocation, arriving at the conclusion as Beaumont did. In particular, he categorized the poverty deconcentration effort in the U.S. into two groups: voluntary and involuntary relocations, HOPE VI and MTO belong to the former and the latter, respectively. By examining movers’ personal experience and the community characteristics from one community that contains both voluntary and involuntary relocations, Goetz figured that there are few evidence in supporting the conclusion that the movers’ living conditions are increasing, no matter which group are they falling into (Goetz 2002). There are other critiques towards the relocation programs' overall function. Jourdan et al. argue that, contrary to its original purpose that deconcentrates poverty through housing voucher, low-income movers in the study end up finding themselves surrounded by neighbors who share the same characteristics with those of prior to relocation (Jourdan et al., 2013). In this sense, relocation program just moved poor households from one place to another, leaving concentrated poverty situation unchanged.

Apart from evaluating the projects from a holistic perspective, a considerable body of literature concerns the impacts of relocation programs on the participants. The existing research focused mainly on two outcomes: changes in social networks and educational achievement among child movers.

Relocation causes the disruption of social support from origins to some extent, leaving movers feeling “less secure, uncertain, simply lonely and isolated” (Popkin et al.,

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<sup>4</sup> This program initiated in the 1970s, yet it accelerated its pace from 1990s (Peres & Schneider, 2012).

2004:31). Chaskin's study resonates with the Popkin et al.'s finding. By focusing on the relocation project in Chicago from the social integration perspective, Chaskin concluded that, on the one hand, relocation benefits the movers in certain ways, on the other hand, "these benefits have not included effective integration" (Chaskin, 2013:260), meaning that the movers lack social support from destinations as well. Wu et al. examined the effect of relocation on social support among older adults (aged 60 and above) in a government-organized relocation program, demonstrating that relocation does associate with declines in social support among the research samples (Wu et al., 2016).

Migration is not an age-neutral life transition (Zeng et al., 2015), nor is relocation. Children are also sometimes victims of the relocation just as the elderly. Previous studies have shown negative relationship between relocation and children's mental and physical health, and their educational outcome. Ladd and Ludwig assessed children's educational outcome in a relocation program through Section 8 Housing Vouchers in Baltimore. They arrived at the conclusion that in conflict with the policy's expectation, relocation did not necessarily improve the educational opportunities of the children whose families were involved (Ladd & Ludwig, 1997). Recently, another study on HOPE VI demonstrates even more adverse effects. Byck et al. compared the experimental group who moved under HOPE VI and control group who remained in the disadvantaged communities, finding that those households who relocated to lower poverty neighborhoods are worse off than those stayers in terms of adolescents' mental and behavioral health. At the same time, the improvement in educational opportunities for adolescents is also limited (Byck et al. 2015).

The policy failure mentioned above promotes scholars to rethink the relocation process. Based on previous experience, Perry and Lindell elaborated a series of principles to ensure a positive relocation outcome (see Perry & Lindell, 1997). Popkin et al. call for "long-term follow-up support" (Popkin et al., 2004:37) for the movers to address the hardships they encountered after the relocation. Similarly, McNamara and Des Combes also suggest that technical and financial cooperation among different agencies are needed to secure the movers' sustainable livelihood in the destinations (McNamara and Des Combes 2015).

### ***Self-driven relocation***

Unlike government-driven relocation programs—which include both voluntary and forced/involuntary relocation—self-driven geographical movements are mostly voluntary. That is, the decision to relocate or not depends on the evaluation of pros and cons the relocation incurred. Previous studies on self-driven relocation mainly focus on the decision-making process which demonstrates how actors mobilize their agency and achieve at the decision of relocation or not under a series of structural constraints.

Self-driven relocations are more likely to be related to career trajectory changes. Noe and Barber speculate that the characteristics of the destination will influence the willingness of relocation. They divided the destinations into similar community and dissimilar community by using binary rural-urban indicator. The results indicate that there are different pathways leading to the relocation to similar community and dissimilar community. Generally, people are more likely to accept the offers to relocate to a similar community as where they presently reside. While look at the two relocation types separately, individual characteristics, career factors, original community involvement and other variables function differently in the decision-making process (see Noe & Barber,



1993). The results highlight the need to incorporate the situations in destination into the relocation willingness analysis, which could be seen as an appeal to study relocation systematically. Later studies went further down the way to the examination of self-driven relocation decision-making. Wagner and Westaby focused on staff's relocation choice from international organization. Their findings suggest that financial incentives and safety perception of the destination have direct impact on the employees' relocation willingness, while incentive is more powerful in explaining the relocation process to culturally dissimilar countries than to similar countries in norms and values (Wagner and Westaby 2009). Hazard-related relocation studies also confirmed that residents in hazard-threatened areas will, to some extent, relocate for health and safety reasons (Bukvic and Owen 2017).

Related research from demographic perspective also identified some individual, household, and community characteristics that influence the relocation decision-making process. Konopaske et al. use data from 1125 alumni from a university to examine their willingness to move long distances. Results demonstrate that personal adventurousness significantly affects the willingness to accept long-term global relocation plan, meanwhile, children at home will significantly decrease the probability of relocation; spouse willingness towards relocation is also salient in the decision-making process (Konopaske et al., 2009). Some other research also finds the spouse effect in the career-related movement (Eby & Russell, 2000; Ullrich et al., 2015). Some research focuses on the movement of college graduates, suggesting that college graduates' relocation decision was less affected by family-relatedness, like marriage and parenthood (Chapa and Wang 2017). Chen and Chi's research shows that it is money that attracts the talent which in turn changed the population distribution (Chen & Chi, 2012).

From a broad, integrated approach, Chi and colleagues associate the population flow brought by self-driven migration with community amenity, transportation accessibility, and land developability, figuring out the different pathways that people's residence/relocation preference towards rural, suburban, and urban areas in the United States (Chen & Chi, 2012; Chi, 2010, 2012, Chi & Marcouiller, 2011, 2012, 2013b, 2013a; Chi & Ventura, 2011).

Draw on the previous studies, we are trying to apply migration system approach to identify the determinants within the relocation willingness and return frequency in the Chinese context. To be specific, the goal of this project aims at answering the following questions: What are the factors that affect their initial relocation willingness at the start of the government relocation program? Does the initial relocation willingness affect their return frequency after relocation? What are the other factors that drive the movers to reside both in the places of origin and destination temporarily?

### **The Case of China**

In 2016, Chinese Government initiated its Targeted Poverty Alleviation Project (TPAP) whose aim is to lift the remaining 55 million people out of poverty in five years (Li et al., 2016). One of the many approaches to achieving the goals is to relocate households in resource-constrained and environmentally-vulnerable areas to settlements that are closer to the market and populated with job opportunities. Under this scenario, each province worked out their quotas and made their timeline in order to finish the quota of movers in a timely way.

Primarily based on the level of economic development, the Chinese central government officially certified “Poverty Counties” and “Poverty Villages” to be targeted by the program. As well, at the household level, under the definition of the Chinese Government, if the per capita annual income of a household is lower than 2736 RMB (approximately 400 dollars) as of 2013, the household will be categorized as a “Poverty Household.” The information of those households was entered into the National Poverty Dataset that was only accessible to government staff from county and upper level. According to the State Council Leading Group Office of Poverty Alleviation and Development, as of the end of 2013, there are 89 million households in the database. It should be noted that the database was left in a changeable state, because under the government regulation if one household overcomes accommodation problems (food and clothing) and can afford compulsory education expenditure, primary health care, and safe housing, the household will be moved out of the database. If available, other households who fall into poverty could be added to the database after a series of inspection from the village level all the way up to the central government.

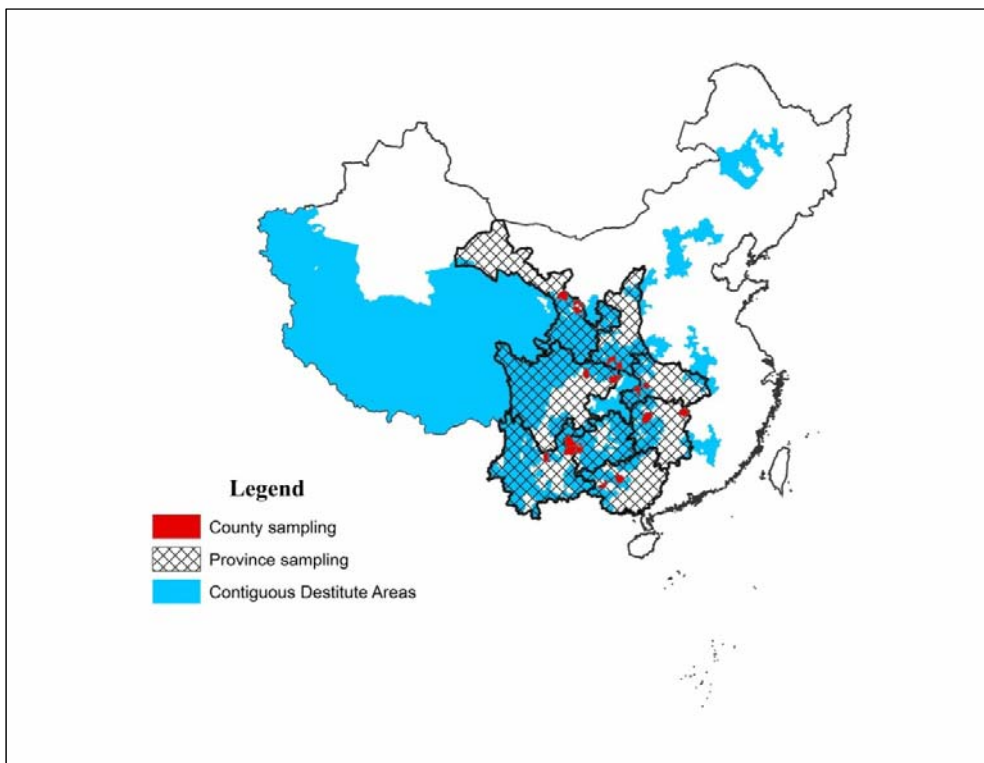
No matter how many are there at a given time, those households in the national database constitute the main target in TPAP. Previous researchers have concluded that relocation breaks the social network affected persons developed and maintained for years in their origins, especially for the elderly (Wu, 2015, 2016; Yawney & Slover, 1973). Partly because of the need to keep their social network and support, preventing them from suffering so much from resettling, moving as a unit was adopted at the household level and village level according to the overall relocation scheme. Certainly, given the number of households, one settlement might not hold all the households from on village. As such, spreading them out to different settlements can be a more realistic way. Meanwhile, non-poverty households will exist even in Poverty Villages. Those non-poverty households were allowed to move along with the targeted poverty households, given that most of the households will move out of those villages. The difference is that Poverty Households who are in the National Poverty Dataset were eligible for a subsidy during the resettling process, usually in the form of a free house (without property rights) in the relocating areas. For non-poverty households, they are responsible for their own moving cost and accommodation, either buy houses in or build houses by themselves in the destinations. To sum it up, the TPAP is a government-driven, voluntary relocation program which subsidizes the impoverished households to relocate and allows the non-poor households to relocate on their own.

## **Data, Sample and Methods**

### ***Data and sample***

The research project is a longitudinal study that will last for the next five years. Currently, we completed two waves of surveys in 2016 and 2017. The initial sample comes from the National Poverty Dataset. We use multi-stage sampling to extract our sample. First, from the fourteen Contiguous Destitute Areas (CDAs, see Chen, Feng, & Chu, 2015; Xinhua News Agency, 2015) which are the main targeted areas in the TPAP, we purposively selected eight provinces that covered the most northern and south-eastern parts of the CDAs (see Figure 2). Second, at the second stage, from each of the eight provinces, two counties were chosen based on their poverty status and accessibility. At this level, the 16 counties are government-identified poor counties which can be easily reached. At the

third stage, we selected three townships from each county whose relocation times are spread out from 2016 to 2019. Fourth, from each of the townships, we selected five villages that fall into different relocation years: two villages that were scheduled to relocate in 2016, the rest of the three are preparing for relocation in 2017, 2018, and 2019, respectively. At last, we randomly chose 8 poor households who deserve subsidy and one non-poor household who is willing to move as the reference group. That said, throughout the sampling procedure, we applied non-probability sampling at the first four stages and probability sampling at the final stage when choosing household, the unit of analysis. The main purpose of doing sampling this way is to meet the needs of panel study to emulate a natural experiment on the one hand, and identify year effect in future research on the other hand.



**Figure 2.** Distribution of the CDAs and the research areas. Data of the CDAs come from Tian et al., 2018

The final sample comprises of 2185 households in the initial 2016 wave who are naturally become our "gene members". Yet, as one of the issues that often occur in panel survey, attrition inevitably took place in the second wave of our survey. In the 2017 survey, we tracked down 1898 households which cover approximately 87 percent of our gene members.

### ***Methods***

The objectives of this research are to address some unanswered questions regarding why some households want to relocate while others do not, even with the subsidy, and why some movers chose dual-habitation after relocation. To answer this series of questions, we will examine the determinants of households' initial relocation willingness, using the 2016 data since it is the first year that the relocation program was put into action. The

willingness is measured by a self-reported 5-point Likert-scale question from 1 to 5 (1=most likely to move, 5=most unlikely to move). We will treat this dependent variable as an ordinal variable, and use ordinal logistic regression model which is believed to be the primary tool to deal with ordinal-level outcomes (Fullerton 2009). The equation for the ordinal logistic regression model is,

$$\ln(Y'_j) = \text{logit}[\pi(x)] = \ln\left(\frac{\pi_j(x)}{1 - \pi_j(x)}\right) = \alpha_j + (-\beta_1 X_1 - \beta_2 X_2 - \dots - \beta_p X_p)$$

Where  $\alpha_j$  denotes the cut point,  $\beta_1, \beta_2 \dots \beta_p$  are logit coefficients, and  $X_1, X_2 \dots X_p$  are the vectors of household characteristics, family economy, social support, and community amenity factors.

After the analysis of their initial willingness, another crucial question emerged: did the relocated individuals integrate into the destination? Previous studies have demonstrated that, in some cases, migrants desire to return to their hometown (Guarnizo 1996; Leavey, Sembhi, and Livingston 2004). In this case, after half-year since the implementation of the relocation, some of the relocated households frequently commute from the new settlements and their places of origin, farming or living in the villages from where they had left. That intrigued our interest to investigate what are the driving factors behind the dual-habitation. After half a year of their relocation, we conducted the second wave of the survey in which we designed a question asking the movers' return frequency. The variable is also a three-scale ordinal variable with 1 represents often, 2 represents sometimes, and 3 represents never. Same as the initial willingness issue, we will fit another ordinal logistic regression model to examine the determinants within this return decision-making process.

### **Variables Description**

For the question of initial relocation willingness (Model 1), we are interested in examining whether the family economy, household characteristics, community amenity, educational resources, and policy understanding affect the final decision-making process. For the latter question of how frequent the relocated households return to their places of origin (Model 2), we want to investigate whether initial willingness, family economy, household characteristics, and other push and pull factors will determine their returning activities. The detailed information and explanation of the variables can be found in Table 1 and Table 2.

We picked the variables according to the previous theoretical framework and empirical evidence. But one thing worth noting is the way we deal with household characteristics. Previously, researchers tend to use information of household head, such as their age, gender, education, and marital status, to differentiate varieties of household. However, we reject this typology particularly in this research for the characteristics of household head vary greatly from case to case over time. For example, traditionally, the oldest men in the household will automatically become the head in most Chinese families; now it is the young males who contribute significantly to the welfare of the unit take the role; there are some highly educated couples will handle major family events collectively. To divide household just by one individual's characteristics cannot reflect the real decision-making process and leave some inconvenience in comparison between studies

from different cultures. Furthermore, there are some validity issues in using the information of household head in this specific dataset. For instance, we detect that there are some teenagers who were marked as household head. The reason is that they come from single-mother families. Conventionally, young males will partially take up their fathers' role and act as the backbone after the death of the father. This causes the validity issue and will affect the efficiency of the statistical results.

We tend to regard the head-based typology as reflection of the configuration of the household. In this view, we combined generations and dummy variables indicating whether or not the household has at least one child ( $\text{age} \leq 16$ ) to differentiate between family types. From this approach, we categorize family type into four groups: one generation, no child; one generation, with child(ren); two and more generations, no child; two and more generations, with child(ren). In so doing, we could use the structural information rather than individual information to see how family configurations affect the decision-making process regarding geographical movements.

**Table 1.** Summary Statistics of Variables in Initial Relocation Willingness Model

VARIABLES	(1) N	(2) Mean or %	(3) sd	(4) min	(5) max
Dependent variable	2,146				
Not likely	13	0.61 %			
Less likely	95	4.43 %			
Undecided	57	2.66 %			
Somewhat likely	357	16.64 %			
Very likely	1,624	75.68 %			
Family type	2,146				
1 generation, no child	913	42.54 %			
1 generation, with child(ren)	495	23.07 %			
2+ generations, no child	221	10.30 %			
2+ generations, with child(ren)	517	24.09 %			
Household size	2,146	3.814	1.519	1	10
Livestock values (Yuan) as of 2015	2,146	1,778	6,424	0	185,500
Land areas (Mu)	2,146	4.717	5.858	0	75
Household savings (Yuan)	2,146	9,075	11,590	-127,201	215,500
Running water	2,146				
Yes	1,134	52.84 %			
No	1,012	47.16 %			
Power outage	2,146				
No power at all	6	0.28 %			
Sometimes	115	5.36 %			
Never	2,025	94.36 %			
Distance (Kilometer) to nearest paved road	2,146	2.183	3.047	0	30
Distance (Kilometer) to nearest market	2,146	10.78	7.583	0	35
Distance (Kilometer) to nearest elementary school	2,146	7.146	7.347	0.0200	90
Distance (Kilometer) to nearest middle school	2,146	16.00	12.60	0.0300	110
Distance (Kilometer) to nearest high school	2,146	54.25	38.18	1	190

Visiting times by officials	2,146	4.469	4.324	0	50
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**Table 2.** Summary Statistics of Variables in Return Frequency Model

VARIABLES	(1) N	(2) Mean or %	(3) sd	(4) min	(5) max
Dependent variable	475				
Never	103	21.68 %			
Sometimes	167	35.16 %			
Always	205	43.16 %			
Initial willingness	475				
Less likely	18	3.79 %			
Undecided	8	1.68 %			
More likely	449	94.53 %			
Family type	475				
1 generation, no child	180	37.89 %			
1 generation, with child(ren)	93	19.58 %			
2+ generations, no child	54	11.37 %			
2+ generations, with child(ren)	148	31.16 %			
Household size	475	4.112	1.708	1	11
Livestock values (Yuan) as of 2016	475	2,605	5,497	0	50,000
Land areas (Mu) in origin	475	7.124	11.52	0	221.4
Lang areas (Mu) in destination	475	0.151	0.779	0	8
Household savings (Yuan)	475	16,309	15,487	-20,500	138,025
Left-behind members	475				
Yes	45	90.53 %			
No	430	9.47 %			
Apartment satisfaction in destination	475	52	7.678	24	60
Number of friends in destination	475	13.74	20.25	0	136
Number of friends in origin	475	26.05	31.27	0	250
Commuting time in returning (Minute)	475	96.95	132.4	0	840

## Results

### *Initial Relocation Willingness Model*

The ordered logistic model was applied to examine the determinants that will affect the initial willingness towards relocation. Table 3 shows the preliminary results. It reveals that the effects of household demographics are not statistically significant. Household saving which was previously considered as the main constraint on relocation is not a significant factor either. This can be explained by the nature of the relocation project in this case. Since the movers will get monetary assistance or in-kind subsidy, we can expect that they will absorb much of the moving expenditure during relocation, which loosens the constraints of economic condition to some extent. But the land area in the places of origin does have a significantly negative effect on the willingness to move. For a one unit increase in farmland area, we would expect approximately 1 percent increase in the willingness of staying. This echoed the conclusion that Chinese society has grown

out of its ties to the land (Fei et al, 1992). The land has been serving as the final straw, rather than merely income sources, that will prevent farmers from starving in unpredicted bad times.

Community amenities also appear to matter. The distance to paved road significantly determined whether the households relocate or not. For one unit increase in distance to paved road, the odds of relocating would be 1.09 times greater than not relocating, given all the other variables in the model are held constant. The other variables denote community amenities, like power supply, running water, and distance to market, are statistically insignificant. This could reflect the reality that the basic infrastructure has been improved in those areas so that they were not serving as constraints within the relocation decision-making process anymore. Yet, for the research areas where most of them are located in remote mountain regions and semi-arid areas, road accessibility continues to be an obstacle in those areas. This result echoed the argument that road accessibility does have an indirect impact on development (Olsson 2009).

Another factor is educational resources. Yet, the effects are different regarding educational stages. For elementary school, we observed a positive relationship between the distance and willingness towards relocation. While for middle school and high school, the impact is not statistically significant. One possible explanation could be that the household has very low expectation towards their children’s educational attainment, which has been approved by Koo through interviews of migrant families in Beijing (Koo 2012).

***Return Frequency Model***

After the analysis of initial willingness towards relocation, we turned to the issue after relocation. Specifically, we want to examine whether the initial willingness and other factors in both the origins and destinations pushed or pulled the relocated household to a certain position in the returning-frequency continuum. We fitted another ordered logistic regression to examine to what extent that certain factors affect the returning frequency. This will give us an overall review of the efficiency of the relocation program.

In particular, we found that the initial willingness has no statistically significant relationship with movers’ return frequency. Yet, the livestock values and the existence of left-behind family members significantly increase the return frequency. And, the existence of left-behind family members has the largest impact on the return frequency: compared with the households who have relocated all the family members, the odds of returning for those who have left-behind members is 14 times greater. Time consumption in returning, on the contrary, will significantly reduce the odds of returning.

**Table 3: Relocation Willingness and Return Frequency Models**

Explanatory variable	Relocation Willingness Model		Return Frequency Model	
	(1) Logit Coeff	(2) Odds Ratio	(3) Logit Coeff	(4) Odds Ratio
Initial Willingness (base group: undecided)				
Less likely to move			0.459 (0.848)	1.582 (1.342)

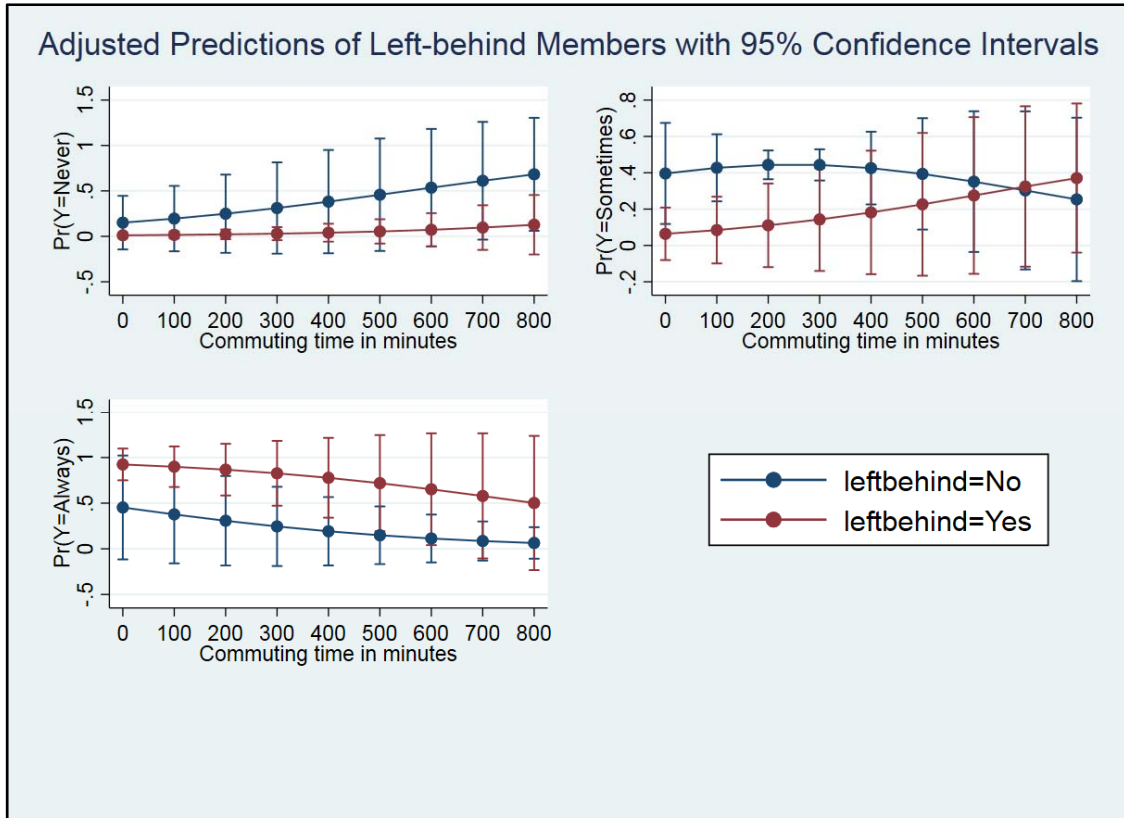
More likely to move			0.452 (0.992)	1.571 (1.558)
Family type (base group: one generation, no child)				
One generation, with child(ren)	0.129 (0.163)	1.138 (0.186)	-0.306 (0.289)	0.737 (0.213)
Two+ generations, no child	-0.104 (0.193)	0.901 (0.174)	0.195 (0.356)	1.215 (0.432)
Two+ generations, with child(ren)	-0.0447 (0.205)	0.956 (0.196)	-0.186 (0.370)	0.830 (0.307)
Household size	0.0288 (0.0573)	1.029 (0.0590)	-0.0236 (0.0978)	0.977 (0.0956)
Livestock values as of 2015	-4.68e-06 (6.87e-06)	1.000 (6.87e-06)		
Livestock values as of 2016			9.67e-05*** (2.40e-05)	1.000*** (2.40e-05)
Land areas	-0.0194* (0.0113)	0.981* (0.0111)		
Land areas in origin			0.00905 (0.0123)	1.009 (0.0124)
Land areas in destination			0.0297 (0.120)	1.030 (0.123)
Household savings	2.69e-06 (4.79e-06)	1.000 (4.79e-06)	5.32e-06 (8.73e-06)	1.000 (8.73e-06)
Running water (dummy variable)				
Yes	0.0684 (0.130)	1.071 (0.140)		
Power outage (base group: No power at all)				
Sometimes	-0.530 (1.145)	0.589 (0.674)		
Never	-0.794 (1.122)	0.452 (0.507)		
Distance to nearest paved road	0.0880*** (0.0294)	1.092*** (0.0321)		
Distance to nearest market	-0.00465 (0.00929)	0.995 (0.00925)		
Distance to nearest elementary school	0.0230** (0.0105)	1.023** (0.0108)		
Distance to nearest middle school	-0.00612 (0.00633)	0.994 (0.00629)		
Distance to nearest high school	0.000530 (0.00207)	1.001 (0.00207)		
Visiting times by officials	0.0181 (0.0153)	1.018 (0.0156)		



Left-behind members (dummy variable)			
Yes		2.689***	14.71***
		(0.486)	(7.147)
Apartment satisfaction in destination		-0.0174	0.983
		(0.0141)	(0.0138)
Numbers of friends in destination		0.00413	1.004
		(0.00484)	(0.00486)
Numbers of friends in origin		0.00190	1.002
		(0.00324)	(0.00324)
Commuting time in returning		-0.00312**	0.997**
		(0.00126)	(0.00125)
County effect	Controlled		Controlled
Observations	2,146		474
<b>Diagnostics</b>			
Log-likelihood			
Model	-1470.445		-434.025
Intercept-only	-1662.313		-503.434
Chi-square			
Deviance	2940.890		868.049
LR	383.736		138.818
p-value	0.000		0.000
IC			
AIC	3010.890		928.049
AIC divided by N	1.403		1.958
BIC	3209.387		1052.886
Mean VIF	1.39		1.35

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 3 shows the predicted probability of returning by left-behind members and time consumption in returning. It is obvious that for those who have relocated all the family members, the probability of not return is higher than that of leaving family members behind in the places of origin. Correspondingly, as shown in the third line graph (c), the household who have their family members left behind are more likely to report that they frequently commute between their places of origins and new settlements, with the probability decrease slightly as the commuting time increase.



**Figure 3.** Predicted probability of returning by left-behind members and commuting time

### Summary and Discussion

The TPAP is currently among the largest relocation projects globally in terms of the population involved. We use primary data collected at the very beginning of the implementation of this project to examine the determinants of movers' willingness towards relocation. Community amenities represent another set of factors that push households out of their places of origin where basic infrastructure like the road is outdated. This echoed Chi's assertion that transport accessibility prompts in-flow population (Chi 2012). Also, the educational resource accessibility comprises one of the push factors that increase the odds of relocation willingness. The familiarity with the policy and benefits serves as another factor that significantly increases the probability of relocation. The amount of farmland, on the other hand, significantly decreases the targeted population's relocation willingness, meaning that land still has the power to tie the farmers to it (Fei 1992). This tendency did not show up in the return frequency model where land area did not significantly affect the mover's return frequency. However, left-behind members and livestock values are factors that still incentivize the relocates to return back to their places of origin. In our sample, we just observed 5 percent movers who were assigned land in the new settlement, and the land area is far less than that in their places of origin. Under this scenario, households who have been relocated return frequently back to their places of origin, farming their land and gaining agricultural income to offset the costs and potential risks they will definitely encounter from the broader society and market economy. That being said, returning serves as backup plan

and diversification mechanism that can compensate for the movers' failure in the new settlement.

Given that the TPAP has witnessed the relocation of millions of individuals, how it works can be valuable for later programs. Currently, it runs quite smoothly with relocation continues and few households return. The temporary success can be attributed to the relocation project itself and the way it was implemented. On the one hand, those households who were targeted for relocation have been suffering from shortage of natural and living resources for generations. Subsidized relocation is one of the few possible ways that can free them from resource constraint, offering more opportunities for themselves and their offspring. On the other hand, the TPAP is voluntary, highly-scrutinized process. To be voluntary guarantees that targeted families' willingness is respected, so those who initially choose to move actually stayed, although foreseeable risk and left-behind family members constantly (or casually) drew them back. And, strict scrutiny from the government at multiple levels towards every step of the implementation of the project ensures its equality for the population involved. Those are among the crucial approaches that Carmon generalized for effective relocation programs that aim at benefiting both places and people (Carmon 1999). Future research can forward related studies by address two issues. First, focus more on the receiving end regarding the farmland developability, labor market, and the subsequent support for the movers. As suggested, finish relocating the subjects is not "the end of the story" (Beaumont, 1976b:87). More work should be done to track the movers and research their transfer progress and final migratory status.

Second, as shown from the results, situations in the places of origin affect the movers' stickiness to the destination. This suggests that migration studies should see the process as a dynamic system which deserves an integrated perspective. Qualitative research could contribute to the analysis of the linkage between places of origin and destination and the feedback mechanism within it through intensive fieldwork and thick description.

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