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WHEN PROTECTIVE RESOURCES ENABLE EXIT: ADAPTIVE RESILIENCE CAPACITY AND SOCIAL CAPITAL AS PREDICTORS OF CLIMATE-INDUCED DISPLACEMENT IN NOSHKI DISTRICT, BALOCHISTAN

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Abstract

Adaptation and community-resilience programming rests on a shared premise: that household capacities and social ties anchor people in place, so that stronger adaptive capacity and denser social capital should reduce climate-induced displacement. This study tests that premise in Noshki District, Balochistan, one of Pakistan's most drought-exposed districts, using a cross-sectional household survey (N = 364) conducted across the district's seven Union Councils. Two hypotheses were examined: that adaptive resilience capacity (H1) and household social capital (H2) each exert a significant negative effect on displacement, with livelihood vulnerability included as a control. Both were rejected in direction. Adaptive resilience capacity was the strongest predictor ($r = .317$, 95% CI [.221, .407], $p < .001$; $B = 0.307$, $SE = 0.066$, $\beta = .249$, $t = 4.68$, $p < .001$), uniquely accounting for 5.3% of the variance in displacement in a model explaining 13.3% overall, $F(3, 360) = 18.37$, $p < .001$. Social capital was also positively associated with displacement ($r = .187$, 95% CI [.086, .284], $p < .001$; $B = 0.168$, $SE = 0.068$, $\beta = .123$, $t = 2.46$, $p = .014$; $sr^2 = .015$). Descriptive evidence points to a mechanism common to both results. The strongest signal in the displacement domain was a wish to live elsewhere coupled with an inability to afford it ($M = 3.55$, $SD = 1.23$), while households reported strong attachment to place alongside the weakest confidence in collective support during individual misfortune ($M = 2.64$, $SD = 1.35$) and frequent contact with earlier migrants ($M = 3.56$, $SD = 1.25$). The findings suggest that in chronically degraded arid environments, resources conventionally treated as protective operate as enabling conditions for mobility, with consequences for how adaptation success is defined and measured.

INTRODUCTION

Adaptation policy in climate-exposed rural economies rests on a proposition that is rarely stated because it is rarely doubted: that strengthening a household's capacities will keep that household where it is. Build the water storage, deliver the forecast, diversify the income stream, and the family that would

otherwise have joined the drift toward the district town will instead stay and absorb the shock. Community-based adaptation extends the same logic to social ties. Aldrich's (2012) comparative work on post-disaster recovery remains the most influential statement of the view that communities with stronger social capital recover faster, and Norris et al. (2008) placed social capital among the core adaptive capacities of resilient communities. Islam and Walkerden (2014) likewise report that links between households and non-governmental organizations supported disaster resilience and recovery in Bangladesh. On this account, displacement is what happens when adaptation has been exhausted: the residual outcome, the failure state, the thing capacity and cohesion are meant to prevent.

The study reports evidence that inverts that expectation. In a survey of 364 households across the seven Union Councils of Noshki District in western Balochistan, adaptive resilience capacity was not merely a weak deterrent to displacement but its strongest positive predictor. Household social capital also predicted more displacement, not less. Both associations survived simultaneous adjustment for livelihood vulnerability, and the resilience association was the only one to reach significance at $p < .001$. Households scoring higher on adaptive practices (savings held in convertible assets, food and water stockpiling, skills acquisition, access to weather information, livelihood substitution) and those embedded in denser community networks reported more displacement experience, intention and aspiration.

Noshki is an instructive place in which to observe this. The district lies in the arid north-western belt of Balochistan, where rain-fed cultivation and agro-pastoralism are sustained by the karez, a system of underground channels that has underwritten settlement in the region for centuries. The drought that began in October 2018 damaged that system in several Union Councils and affected more than 33,000 residents, over 23,000 of them severely, according to the district administration's communication to the Provincial Disaster Management Authority (Dawn, 2018). Households in Dak, Anam Bostan and Kashingi moved toward the outskirts of Noshki town. But, those in other households of the same Councils, who had the same livestock losses and the same failed karezes, did not relocate. This analytical gap is the starting point of this study. If displacement was just due to exposure, then households should have moved together. But they did not — and what sets those who did apart?

The answer that emerges here is based on the scholarship of migration, in which migration itself is considered an act in which resources are used. McLeman and Smit (2006) suggested that migration should be considered as one of the adaptations that households can make rather than an indicator of lack of adaptation. Black et al. (2011) placed environmental stress in the context of other interacting pressures. Kaczan and Orgill-Meyer (2020) noted that climate shocks can increase the desire to relocate and can also increase the constraints on moving; De Haas (2021) formalized this in an aspiration–capabilities framework where constraints to moving may indicate preference for staying put. A parallel research strand on migrant networks (Massey et al., 1993) demonstrates that the information and psychological risks of migration are reduced by previous contacts. Combined, these literatures suggest that the capacities enumerated as resilience are not necessarily destination-neutral, and the ties enumerated as social capital are not necessarily location-neutral. Savings can be used for one season of purchased fodder, or for a bus trip to Quetta and three months' rent. The information of a failed monsoon can be used to make a planting decision or departure date. It is comforting to a family who stays to have a family member in the city, or a room for a family who leaves.

The study makes three contributions. It tests the protective expectation for two of the most widely invoked household resources within a single multivariate model, so that their relative weight can be assessed. It uses descriptive evidence from the displacement, resilience and social capital domains to specify the mechanisms that could produce a positive association. And it draws out the implications for how adaptation outcomes are defined and

measured in settings where the in-situ option has been structurally degraded.

2. Conceptual Framework and Hypotheses

2.1 Resilience and the in-situ assumption

The concept of resilience has been introduced into social-ecological analysis through the work of Holling (1973), who demonstrated this capacity of a system to absorb the disturbance and maintain its function, and later expanded to include adaptation and transformation by Folke (2006) as well as persistence. At the household level adaptive resilience capacity is generally interpreted as the capacity to anticipate, absorb, respond to, and recover from shocks without compromising livelihood outcomes, and typically assigns observable capacities like the number of assets that can be liquidated, the number of diversified income sources, the amount and type of human capital (education, transferable skills), access to early warning information, and evidence of adjusting livelihood under stress.

The spatial assumption is not as prominently stated in the framework. The persistence, absorption and recovery all rely on a system that remains in place – the language of "bouncing back" assumes there's a place to bounce back to. That assumption is taken for granted when transferred to household decision-making, so when people make decisions, they have a framework in mind where they are "staying" is a resilient outcome; they are "leaving" is not. Indeed, Béné et al. (2012) cautioned that the concept of resilience had taken on a normative cargo of just this nature, and Cote and Nightingale (2012) suggested that the social-ecological nature of the framework was disadvantageous for dealing with the structural constraints and power asymmetries that mediate whose adaptation is possible at all. Both criticisms have not significantly displaced the assumption that in-situ retention is the default criteria for success in adaptation programming.

2.2 Social capital as a protective resource

The most widely used definition of social capital comes from Putnam (2000) who defines it as the networks, norms and trust that allow for coordinated action and interaction. Putnam (1993) earlier had been able to distinguish bonding social capital (dense ties within a homogeneous group) from bridging social capital (ties that cross group boundaries and lead to a broader resource and information base). Coleman (1988) highlighted its role as a mechanism for mobilizing resources particularly in situations of low formal safety nets, which is relevant to the Balochistan context in rural areas. Adger (2003) directly transferred the concept to climate adaptation, claiming that communities with high social network cohesion were more resilient to shocks when they shared the work, resources and risk management.

This protective logic has been generally supported by the disaster-recovery literature. Along with economic development, information and communication, and community competence, social ties were identified as one of the most critical post disaster recovery resources across a series of national contexts by Aldrich (2012) and positioned as one of four main community adaptive capacities by Norris et al. (2008). On this body of evidence, the argument is simple for Noshki: expectations are higher that households in communities with high social capital will be better able to weather drought together, and that households with high social capital will experience lower rates of displacement.

2.3 Mobility as a capacity- and network-dependent outcome

Migration scholarship came to a different stop. McLeman and Smit (2006) repurposed the concept of environmental migration as an adaptive strategy from a household's portfolio of adaptation strategies, implying that migration is not a lack of the strategy, but rather one of its many options that is chosen because it is expected to yield the best returns. Black et al. (2011) stressed the need for explaining why migrants do not migrate, as well as why they do migrate. De Haas (2021) weaves these strands into the concept of aspirations–capabilities, which distinguishes between the desire to move and whether and how such a desire is realized, resulting in two categories of aspiration and two of capability: voluntary mobility, involuntary mobility, and voluntary

immobility and, of relevance here, involuntary immobility, in which those who wish to leave do not. The key message of the framework for adaptation to climate change is unwelcome. When mobility requires resources, it may be the climate-stressed households that are the least able to move and interventions that increase household capacities may lead to more, not less, mobility. A severe shock can have a negative impact on migration; where there is a shock, it can be non-linear (Kaczan and Orgill-Meyer, 2020).

In addition to the capability mechanism is a second mechanism based on the networks. Massey et al. (1993) believe that previous migrant contacts lower the informational and psychological barriers to later migrants: It is easier, not difficult, to move once someone else has done it. The desire to migrate (Czaika & Vothknecht, 2014) also presents a social stage that is a separate stage of the migration aspiration. Both Bourdieu (1986) and Portes (1998) warn that social capital is not necessarily a positive asset because networks of access are class, gender and ethnicity related and the same network can serve some people's interests, while restricting the access of others.

Aldrich and Meyer (2015) note that communities already displaced, or in the process of displacing, often rebuild social capital in new locations rather than deploying existing capital solely toward staying, so that its relationship to mobility may run in either direction depending on context and the stage of a slow-onset crisis. Where migration is itself a form of household adaptation, a network that supplies information, contacts and reduced psychological cost for that adaptation is not obviously protective of in-situ persistence.

2.4 The Balochistan context

Balochistan is Pakistan's most arid province and among its least studied. Ashraf and Routray (2015) documented the spatio-temporal intensification of drought across the province, and Ashraf et al. (2021) quantified the resulting risk to livelihoods, finding rural, natural-resource-dependent households in arid and semi-arid zones disproportionately exposed. The provincial climate change policy notes that Balochistan absorbed a substantial share of the 8.2 million disaster-related displacements recorded nationally in 2022, while simultaneously hosting Afghan displacement inflows that compress local labor markets (UNDP, 2024). Formal adaptation support reaches remote districts thinly, so household and community resources carry most of the adaptive burden.

The social capital is manifested in rural Balochistan by the tribal solidarity networks (biraderi), in the form of rotating saving associations, through communal labour-sharing, and through religious charitable associations like Zakat and Sadaqah, and informal security networks based on kinship. Historically, these institutions have been key for pooling resources and spreading risks among households, but the increasing exacerbation of poverty, more frequent droughts and floods, out-migration of household members and the declining role of traditional institutions in risk sharing at the household level are increasingly challenging these institutions (UNDP, 2024). With such exposure levels and limited institutional services and a compromised productive base, Noshki poses a difficult challenge to the in-situ assumption. Where the karez has failed, the adaptive capacity that might otherwise have enabled people to remain in the same place is missing, and so is their social obligation. And the theory that capacity and cohesion reduce mobility is now at risk.

2.5 Hypotheses

The study tested the conventional protective expectation for each resource in its standard form:

H1: Adaptive resilience capacity has a significant negative effect on climate-induced displacement in Noshki, Balochistan.

H2: Household social capital has a significant negative effect on climate-induced displacement in Noshki, Balochistan.

Both hypotheses were tested within a single three-predictor simultaneous regression that also included livelihood vulnerability as a control. This permits an estimate of the unique contribution of each resource net of the other and of household exposure to environmental hazard.

3. Methodology

3.1 Study area and design

The study employed a quantitative cross-sectional survey design in Noshki District, Balochistan. The district comprises seven Union Councils (Dak, Jamaldini, Ahmedwall, Mengal, Kashingi, Mal and Anam Bostan) in addition to the district town. Livelihoods across the rural Union Councils rest on rain-fed cultivation, livestock rearing and karez-fed irrigation, all three of which were affected by the drought that began in October 2018 and by subsequent flooding in 2022.

3.2 Sampling and participants

A purposive and quota-based method was used to select 30 males and 20 females respondents (50 per council) from each of the seven Union Councils and another 15 respondents from Noshki town, making a total of N = 365 respondents. The aim of quota allocation between Union Councils was to keep the sample not only in the less accessible peri-urban areas but also to ensure variation of exposure, type of livelihoods and adaptation practices along the ecological gradients of the district. Purposive selection was used because it was not a research question about the general population, but one about the people who experienced climate induced livelihood stress; this is a trade-off for inferential scope, which is addressed in Section 7. This was in line with the per-council quota of 140 women and 210 men, and is considered the realized sample that was collected. The realized sample comprised 225 men and 140 women, which was in-line with the per-council quota of 140 women and 210 men across the seven Union Councils; then 15 additional men were collected in Noshki town. The analytic sample for the final data analysis is N = 364, which represents 99.7% of the cases (1 case was removed by listwise deletion).

3.3 Instrument and measures

Data gathered were subjected to a structured questioning and generally were collected by online form with paper form for those who had no access to the internet. A total of 40 items were integrated into a schedule, using 4 adapted instruments. The items were all on five-point scales except for the social capital item, willingness to help a neighbor, which was on a 10-point scale.

Adaptive resilience capacity was measured with ten items adapted from the UNDP (2004) adaptive capacity framework, the absorptive–adaptive–transformative typology of Béné et al. (2012), the DROP model (Cutter et al., 2008) and the human capital elements of the Sustainable Livelihoods Framework (DFID, 1999). Items were contextualized to the district, for example savings held as gold rather than bank deposits, livestock-related skill acquisition rather than generic vocational training, and receipt of weather forecasts in a setting where formal extension services are sparse.

Household social capital was measured with eleven items spanning the bonding, bridging and linking dimensions of Putnam (2000), contextualized to local institutions: willingness to help a neighbor experiencing an economic loss; participation in community organizations; receipt of economic support during family events; community trust; sense of belonging to the village; perception of the village as a good place to live; perceived collective village response to individual misfortune; financial support received in the past year; presence of relatives or friends in major urban areas; contact with previously migrated individuals; and belief that strong community ties aid household resilience.

Livelihood vulnerability (control) was measured with nine items indexing exposure and sensitivity to drought severity, decadal decline in water availability, crop and livestock loss, dust storm damage to solar infrastructure, monsoon disruption, rainfall unpredictability, decline in livestock productivity and flood damage to grazing land, following the IPCC (2007) exposure–sensitivity–adaptive capacity structure.

Climate-induced displacement was measured with ten items covering the continuum from aspiration and intention through temporary relocation to realized movement, drawing on the driver framework of Black et al. (2011) and the decision model of McLeman and Smit (2006). Composite indices were formed by summation within each domain.

3.4 Reliability

The full instrument (40 items) showed internal consistency of α = .723, exceeding the .70 criterion for instruments measuring broad multidimensional constructs (Nunnally & Bernstein, 1994; Hair et al., 2019). The coefficient was not calculated at the domain level, but rather at the overall level of the schedule, so it is more aptly interpreted as representing evidence of a common underlying phenomenon across the schedule than as a reliability coefficient for the subscales of resilience or social capital; no subscale coefficients were calculated because they were not reported; this is noted in Section 7.

3.5 Analytic strategy

Data was analyzed using the software SPSS. The bivariate structure was determined by Pearson product-moment correlations. Multiple linear regression was then used to determine how much each of the predictors independently contributed to Displacement Index that did not suggest any particular order with which to enter the predictors, as in the case of regression (Tabachnick & Fidell, 2019). The sample size of N = 364 is greater than the three predictors requirement of Green's (1991) criterion. Prior to interpretation, regression assumptions of linearity, independence of residuals, homoscedasticity and absence of multicollinearity were reviewed. The range of inter-predictor correlations was from .164 to .379, which is below the .80 threshold of concern (Pallant, 2020) and variance inflation factors ranged from 1.04 to 1.19. Effect sizes are presented as squared semi-partial correlations (sr^2) reflecting only the variance accounted for by each predictor, and as Cohen's (1988) f^2.

4. Results

4.1 The adaptive resilience domain

The ten items of the Adaptive Resilience Capacity were presented descriptively in Table 1. The Item values are fairly concentrated around an average of 3.41 to 3.72, meaning that approximately all students in the sample are moderately to highly engaged in adaptive practice and there is not much variation between different types of practice. The highest mean (M = 3.72, SD = 1.21) was for receipt of weather forecasts, followed by education as an input to livelihood decision-making (M = 3.67, SD = 1.13), and stockpiling foods and water for dry spells (M = 3.63, SD = 1.19). The capacity items that were positively framed had the lowest saving in the category of convertible assets (M = 3.45, SD = 1.25).

Two features of this distribution need to be noted prior to the inferential results. First, the uniformity of the means indicates a general rather than a specific adaptive practice in Noshki: households practice in many capacity domains, at moderate levels, rather than specializing. Second, and, more importantly, for interpretation, two of the ten items index mobility directly, namely 'temporary labour migration' (M = 3.56, SD = 1.25) and 'how often do you have to send a member of the household to work elsewhere' (M = 3.52, SD = 1.21). Both were added to the index with a theoretical basis that the split-household deployment of labour is a known diversification strategy, but their inclusion in the index has implications for the central estimate, which are discussed in Section 7.

Table 1 Descriptive Statistics for Adaptive Resilience Capacity Items (N = 364)

Item	Min	Max	*M*	*SD*
Household receives weather forecasts	1	5	3.72	1.208
Education supports livelihood decision-making	1	5	3.67	1.131
Stores extra food/water for dry spells	1	5	3.63	1.189
Changed livelihood/farming due to drought or floods	1	5	3.57	1.205
Willingness to learn new livelihood skills	1	5	3.57	1.166
Temporary migration for work	0	5	3.56	1.246
Sends family member to work elsewhere	1	5	3.52	1.205
Family member received livestock skill development	0	5	3.49	1.265
Household has savings (e.g., gold)	0	5	3.45	1.249
Family member unable to work due to health (12 months)	1	5	3.41	1.255

Note. Items were measured on five-point scales. M = mean; *SD* = standard deviation.

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4.2 The social capital domain

Descriptive statistics for the eleven social capital items appear in Table 2. Participation in community organizations (*M* = 3.87, *SD* = 1.029), perception of the village as a good place to live (M = 3.81, *SD* = 1.148) and sense of belonging to the community (M = 3.79, *SD* = 1.060) recorded the highest means among the five-point items, indicating strong affective and identity-based attachment to place. Willingness to help a neighbor facing an economic loss (M = 4.10, *SD* = 2.376) was measured on a ten-point scale, so its mean is not comparable with those of the other items and falls below that scale's midpoint of 5.5. Its standard deviation is nearly double that of any other item in the domain, indicating considerable heterogeneity in pro-social orientation across households, plausibly reflecting differing capacities to extend assistance.

Two items are of particular interest for the interpretation that follows. Contact with previously migrated individuals recorded a comparatively high mean (*M* = 3.56, *SD* = 1.253), indicating that a substantial share of households maintains active ties to people who have already left. By contrast, perceived collective village response to individual misfortune recorded the lowest mean in the entire domain (M = 2.64, *SD* = 1.352), more than one scale point below the belonging and place-attachment items. Households in Noshki report strong attachment to place and moderate trust, but comparatively weak confidence that their community will mobilize collectively when an individual household experiences hardship.

Table 2 Descriptive Statistics for Household Social Capital Items (N = 364)

Item	Min	Max	*M*	*SD*
Willingness to help neighbor (economic loss)	1	10	4.10	2.376
Household participation in community organizations	1	5	3.87	1.029
Village perceived as a good place to live	1	5	3.81	1.148
Sense of belonging to village/community	1	5	3.79	1.060
Contact with previously migrated people	1	5	3.56	1.253
Community trust level	1	5	3.54	1.124
Belief: strong community ties aid resilience	1	5	3.48	1.239
Family receives economic support (marriage/events)	1	5	3.46	1.197
Relatives/friends living in major urban areas	1	5	3.42	1.263
Financial support received in past year	1	5	3.22	1.295
Village collective response to misfortune	1	5	2.64	1.352

Note. Items were measured on five-point scales except (a) willingness to help, which was measured on a ten-point scale. *M* = mean; *SD* = standard deviation.

4.3 Bivariate associations

All four study variables were positively and significantly intercorrelated (Table 3). Adaptive resilience capacity showed the strongest association with displacement of any predictor, $r = .317$, 95% CI [.221, .407], $p < .001$, a small-to-moderate effect by Cohen's (1988) conventions whose confidence interval excludes zero by a comfortable margin. Livelihood vulnerability followed at $r = .242$, $p < .001$, and social capital at $r = .187$, 95% CI [.086, .284], $p < .001$, a small effect whose interval nonetheless excludes zero.

The direction of both associations is the finding of interest, and it is opposite to the hypothesized sign in each case. The most adaptively capable and the most socially connected households in the sample reported more displacement, not less. Resilience was also the predictor most strongly bound to livelihood vulnerability ($r = .379$, $p < .001$), the largest coefficient in the matrix, indicating that adaptive practice in Noshki is concentrated among households under the greatest livelihood stress, so that capacity is being built by, and in response to, exposure. Social capital correlated more weakly with the other predictors ($r = .164$ with resilience and $r = .177$ with vulnerability, both $p < .01$) than they correlated with each other, so its association with displacement was not an artefact of shared variance with those constructs.

Table 3Pearson Product-Moment Correlations Among Study Variables (N = 364)

Variable	1	2	3	4
1. Displacement Index	—			
2. Social Capital Index	.187**	—		
3. Livelihood Vulnerability Index	.242**	.177**	—	
4. Adaptive Resilience Capacity Index	.317**	.164**	.379**	—

Note. ** $p < .01$ (two-tailed).

4.4 Regression model

The simultaneous regression of the Displacement Index on the three predictors was significant, $F(3, 360) = 18.37$, $p < .001$, with $R = .364$ and $R^2 = .133$ (adjusted $R^2 = .126$). The model therefore accounts for 13.3% of the variance in displacement, a magnitude consistent with multivariate models of complex socio-environmental outcomes in which substantial determinants, such as land tenure, political conditions and intra-household bargaining, remain unmeasured.

Coefficients appear in Table 4. Adaptive resilience capacity was the strongest predictor by a clear margin, $B = 0.307$, 95% CI [0.177, 0.437], $SE = 0.066$, $\beta = .249$, $t = 4.68$, $p < .001$. A one-standard-deviation increase in resilience corresponds to a quarter of a standard deviation increase in displacement, holding the other predictors constant. Social capital was a significant independent predictor, $B = 0.168$, 95% CI [0.034, 0.302], $SE = 0.068$, $\beta = .123$, $t = 2.46$, $p = .014$, uniquely explaining 1.5% of the variance in displacement ($f^2 = .017$). Livelihood vulnerability was also significant ($B = 0.163$, $\beta = .126$, $t = 2.36$, $p = .019$). Both of these effects are significant at conventional rather than stringent thresholds, and their confidence intervals approach zero at the lower bound.

Table 4 Multiple Regression Predicting Climate-Induced Displacement (N = 364)

Predictor	*B*	*SE B*	95% CI	*B*	*t*	*p*	sr^2
(Constant)	9.925	3.247	[3.54, 16.31]	—	3.06	.002	—
Social Capital Index	**0.168**	**0.068**	**[0.03, 0.30]**	**.123**	**2.46**	**.014**	**.015**
Livelihood Vulnerability Index	0.163	0.069	[0.03, 0.30]	.126	2.36	.019	.013
Adaptive Resilience Capacity Index	**0.307**	**0.066**	**[0.18, 0.44]**	**.249**	**4.68**	**< .001**	**.053**

Note. $R^2 = .133$; adjusted $R^2 = .126$; $F(3, 360) = 18.37$, $p < .001$. sr^2 = squared semi-partial correlation (unique variance). Dependent variable: Displacement Index. Shaded rows indicate the focal predictors of this article; the Livelihood Vulnerability Index was included as a control.

4.5 Relative importance and tests of the hypotheses

The standardized coefficients underestimate the degree of variation in the distribution of the explanatory work between the model. In addition to social capital (1.5%) and livelihood vulnerability (1.3%), adaptive resilience capacity accounts for a unique 5.3% of variance in displacement. The uniqueness of the explanatory burden of resilience is about 3.5 to 4 times that of either of the alternative predictors and resilience alone accounts for about 40% of the total explained variance of the model. The within-model effect size is roughly three and a half to four times larger for the other education factors, social capital and vulnerability, respectively ($f^2 = .061$ and .017). The resilience t statistic is about twice as high as those of its companions.

This asymmetry matters for how the model should be read. It is not the case that three predictors contributed comparably to a modest overall fit. One predictor did most of the work, and it did so in the direction opposite to theory. The hypothesis that adaptive resilience capacity exerts a negative effect on climate-induced displacement (H1) is therefore rejected. The hypothesis that household social capital exerts a negative effect (H2) is likewise rejected: the effect is significant, but positive and small.

5. Discussion

5.1 Resilience as enabling capacity

The most economical reading of the resilience result is that the capacities the instrument measured are convertible, and that in Noshki they are being converted toward exit. Every

item in the resilience index describes a resource with two possible deployments. Gold savings can fund a season of purchased fodder or a deposit on a room in Quetta. Willingness to learn new livelihood skills can support substitution into off-farm work locally or portability into a labour market elsewhere. Weather information can time a planting or time a departure. The index does not, and cannot, distinguish between these deployments; it registers the resource, not its direction of use.

Where the in-situ option retains value, one would expect these resources to be spent on staying, and the conventional negative association would appear. Where the in-situ option has been structurally degraded, because the karez has collapsed, grazing land has been flood-damaged and livestock productivity has fallen, the same resources are available to fund the alternative. The livelihood vulnerability descriptives document this situation. Exposure was moderate-to-high and remarkably consistent across hazard domains, with drought (M = 3.72), flood damage to grazing land (M = 3.72), decadal water decline (M = 3.63) and livestock loss (M = 3.62) all clustered tightly. The positive association of vulnerability with displacement (β = .126, p = .019) is consistent with the Sustainable Livelihoods Framework (Chambers & Conway, 1992; DFID, 1999). Under such conditions, building household capacity does not produce retention. It produces the means to leave.

This is what McLeman and Smit (2006) suggested 20 years ago, and the Noshki data illustrate a quantified example. Migration is not something that happens when adaptation fails, it's one of the things that is bought by adaptation. The finding by Kaczan and Orgill-Meyer (2020) that severe shocks can have a negative effect on migration by driving up destitution is the inverse of the same mechanism—the positive coefficient reported here—that a severe increase in capacity can drive a spike in migration.

5.2 The aspirations–capabilities gap as mechanism

This is supported directly by the descriptive data, and is the most important single number in the study. The mean highest on the ten items of displacement was for the statement: "The household would like to live elsewhere, but can't afford it." (M = 3.55, SD = 1.23). The least popular attributions in the displacement domain were that migration was mainly due to flood and drought (M = 2.83, SD = 1.21). M = 3.13 was the number of households that were expected to move within the next year for their main member.

The pattern is predicted by De Haas (2021). The stated obstacle is actually a monetary one, not a lack of interest, and aspiration to move is significantly larger than actual and expected movement. Many of Noshki households are in the quadrant of involuntary immobility: they want to move out, but are unable to. If anything increases the household capacity in such a population, it will cause households to cross the capability threshold, and displacement increases. The Resilience Coefficient, on this reading, is an estimate of the amount of capacity required to turn an aspiration into a move.

This is not an impediment to the low attribution to climatic causes, as discussed above. High-exposure households are not required to describe their mobility in climatic terms as the route from drought to the move is through income, debt, and employment, which are the immediate factors that would be cited by a respondent. In the literature, the idea of multi-causality is the expectation that one has, and here it reinforces, rather than weakens, the account (Black et al., 2011; Rigaud et al., 2018).

5.3 Social capital: bonding without functional reciprocity, bridging as migration infrastructure

The social capital result is also in line with this logic, and the descriptive profile in table 2 provides the clearest lead. This item set fits nicely with Putnam's two concepts of bonding capital (close relationships within a homogeneous community) and bridging capital (relationships that span group boundaries to connect with outside resources; 1993, 2000). Bonding capital was consistently highly associated with the identity- and belonging-based items: sense of belonging (M = 3.79), the village as a good place to live (M = 3.81) and

community trust (M = 3.54). There is no social isolation between Noshki households.

Functional reciprocity under stress is relatively low. The item asking whether the village collectively reacts to when an individual household's misfortune was the lowest of the domain, M = 2.64, and approximately a scale point lower than the belonging and trust items it conceptually resides with. This, on this evidence, puts bonding capital in a dialectical relationship with a limited degree of confidence that the community will mobilize materially when a household requires it. Bourdieu's (1986) caution that social capital is not uniformly beneficial is appropriate; a family may feel very close to the community, but may not think, correctly or not, that this closeness will be rewarded by material support in times of trouble.

Putnam's typology also points to contact with previously moved people (M = 3.56), as an example of bridging capital. Massey et al. (1993) believe that this particular form of contact, as opposed to community trust, reduces the cost of information and psychologically reduces the cost of the household's own move. Together, both findings indicate a specific mechanism, not a general one, that might explain the findings of the study. There is no lack of social capital at Noshki as participation, trust and belonging are comparatively high. The specific shape taken by the particular, strong bonding ties, weak functional reciprocity, and bridging ties to the existing migrant network, supplies the conditions under which the network approach to migration can account for predicted facilitation of mobility, rather than for the collective in-situ recovery expected from the disaster-recovery literature. In the abstract, the two theories are not in conflict—two types of networks, and Noshki's configuration is the more migration-friendly one.

5.4 Reconciling with the disaster-recovery literature

The social capital finding should not be interpreted as in opposition to the findings by Aldrich (2012) and Islam and Walkerden (2014). These both refer to recovery from singular disaster events, in which the issue is whether a community reconstructs itself in the same spot following disaster. The drought in Noshki is a multi-year situation that is slowly unfolding: this is not a temporary shock to an otherwise sound karez system, but a re-building of an asset that no longer works. The finding by Aldrich and Meyer (2015) that social capital tends to be reconstructed in new places instead of simply moved to the site of the stay are consistent with the fact that staying is no longer an easy option.

Gatiso and Greenhalgh (2025) conclude that if social capital is used to measure the extent of resilience, then the apparent gap in resilience between ethnic groups in Fiji is reduced. Measuring directly, in Noshki, the same construct has the inverse empirical signature. This re-emphasises that the social capital/displacement connection is an empirical matter that varies with network configurations and hazard type, and cannot be assumed as constant across locations.

5.5 Implications for resilience theory and measurement

The resilience and social capital indicators can be better understood together than apart. Both are conventionally considered as anchors and both were enabling conditions in Noshki in one way or another; one by providing a way in which to move and the other by providing the information and contacts and lowered psychological costs of moving. There are three theoretical implications.

The first is related to measurement. The sign in all displacement models is an empirical matter regarding opportunity structures in the localities and is not a theoretical constant, by construction, if resilience indices count convertible resources and do not account for their deployment. This is also true of social capital indices which do not distinguish between cohesion and migrant connectivity. An instrument designed to measure in-situ coping should ask 'for what purpose was this capacity used' rather than simply 'Is this capacity present'.

The second concerns the normative content of the construct. Béné et al. (2012) cautioned that resilience carries an implicit valorization of persistence. The Noshki case shows the cost of that assumption concretely: a programme

evaluated on whether it reduced out-migration would score a capacity-building intervention here as a failure, when the households that moved may have secured better outcomes than those that could not. Cote and Nightingale's (2012) argument that resilience thinking under-attends to structural constraint applies directly, since what determines whether capacity is spent on staying or leaving in Noshki is the condition of the karez and the grazing land, and not the household's disposition.

The third concerns the dichotomy between migration-as-failure and in-situ-adaptation-as-success that continues to organize adaptation programming. These data do not support it. The households that moved were, on the evidence here, the more capable and better-connected ones, and the households that stayed included a substantial group that stayed because they could not afford otherwise. Treating immobility as the success condition means, in this district, treating involuntary immobility as a policy achievement.

6. Policy Implications

If capacity and connectivity enable mobility where the in-situ option has been structurally degraded, four programming consequences follow.

First, adaptation programmes in arid Balochistan should stop treating reduced out-migration as their success metric. A capacity-building intervention that increases movement may be working as intended, and a cohesion-building intervention that strengthens migrant-linked networks may produce the reverse of reduced out-migration. Appropriate metrics concern outcomes, such as income stability, food security, health and whether movement was chosen, and not location.

Second, the aspirations–capabilities gap identifies a group that current provision misses entirely: households that wish to move and cannot. At M = 3.55, this was the strongest signal in the displacement domain. Financial instruments that make movement safe and orderly, including migration-linked microfinance, portable social protection, recognition of drought-displaced households within provincial disaster frameworks and managed relocation where the karez cannot be restored, address a constraint that in-situ programming does not touch. The national and provincial climate policy frameworks (UNDP, 2024) appear to lack explicit provision for slow-onset displacement of this kind.

Third, community-based programming should distinguish between bonding capital (general belonging, trust, identity) and the functional reciprocity captured by the collective-misfortune-response item, since the two diverge sharply within the same community. Interventions that strengthen material mutual-aid mechanisms, such as community grain or fodder banks, formalized rotating support funds and structured collective response protocols for household-level shocks, target the specific gap this item identifies. Migrant-contact networks, in turn, are better treated as an information channel to work with than a resource to suppress. Agencies could use the same networks to disseminate accurate information about in-situ support options, managed relocation programmes and portable social protection.

Fourth, in-situ investment retains its case, but on different grounds. Livelihood vulnerability remained a significant independent predictor, and karez rehabilitation, groundwater management and rangeland restoration act on the structural condition that determines whether household capacity gets spent on staying or on leaving. The two limbs are complementary and not competing: restoring the in-situ option changes what capacity is for, while financing mobility protects those for whom restoration will arrive too late.

7. Limitations and Directions for Future Research

Cross-sectional design. The data used are only a snapshot in time and do not allow to draw conclusions about cause-and-effect relationships. This interpretation, which posits that capacity/connectivity is a prerequisite for movement is one of two readings that are compatible with the correlations. It is not possible to rule out from these data that adaptive capacity and migrant networks develop as a result of displacement experience itself, namely through exposure and learning. They

must be distinguished by a longitudinal or panel design.

Sampling and reliability. Because of the explanatory goal, the use of purposive quota sampling was considered appropriate and the results cannot be generalized to the district population as such; the results can, however, be generalized to other comparable karez dependent arid environments. There were more male respondents than female (225 vs 140) but this affected availability for survey and meant that the analysis was limited, a particular concern because of the gendered nature of social capital (Bourdieu, 1986). Last, internal consistency was calculated for the entire 40-item instrument (α = .723) and not for subscales; domain scores for the two subscales (resilience and social capital) should be reported prior to the re-use of these measures.

8. Conclusion

Adaptive resilience capacity was the strongest predictor of climate-induced displacement among Noshki households, and it predicted more displacement rather than less. It carried roughly four times the unique explanatory weight of either social capital or livelihood vulnerability and was the only predictor significant at $p < .001$. Household social capital was also positively and significantly associated with displacement (β = .123, p = .014), albeit with a small effect. Both hypotheses of a protective, negative relationship were rejected in direction.

Read with the descriptive evidence that the strongest displacement signal in the district is the desire to leave without the means to do so, and that strong attachment to place coexists with weak collective reciprocity and active ties to earlier migrants, the results support a reading of mobility in arid Balochistan as capacity- and network-mediated and not as capacity-exhausted. Resilience and social capital in Noshki do not appear to be what keeps households in place. They appear to be part of what allows them to go. Subject to the robustness checks set out in Section 7, and to longitudinal confirmation of causal direction, this repositions displacement from the failure state of adaptation policy to one of its possible outputs, and asks adaptation programming to decide, deliberately, which outcome it is trying to produce.

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