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## From Ger to Market: Empowering Women Entrepreneurs in Isolated Desert Communities of Southern Mongolia

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### ABSTRACT

Women in the remote desert communities of Southern Mongolia's Gobi region face compounding disadvantages: extreme geographic isolation, persistent gender norms that constrain economic agency, minimal access to financial services, and accelerating climate stress that erodes traditional pastoral livelihoods. This community service study reports the design, implementation, and outcomes of a six-month participatory entrepreneurship empowerment program – titled Gobi Women Rise – conducted across three soum-level communities in Ömnögovi Province, engaging 76 women aged 18 to 58. The program delivered six integrated training modules addressing financial literacy, handicraft value-chain development, digital commerce, cooperative governance, climate-adaptive livelihood planning, and negotiation skills, alongside the establishment of a peer-supported women's cooperative network. Using a pre-test/post-test design with qualitative triangulation, findings demonstrate significant improvements across economic, psychological, and social dimensions of empowerment, including a 67.7% increase in mean monthly household income, an 83.2% improvement in Women's Empowerment Index scores, and the registration of 63.2% of participants on digital marketplaces. These results advance evidence-based frameworks for gender-sensitive entrepreneurship development in extreme

geographic and climatic contexts.

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## INTRODUCTION

Mongolia's Gobi Desert, stretching across the southern third of the country and extending into northern China, constitutes one of the world's most extreme inhabited environments—a high-altitude cold desert characterized by temperature swings exceeding 50 degrees Celsius between seasons, violent dust storms (dzud), and an annual rainfall averaging between 50 and 200 millimeters. Within this landscape, women in pastoral and semi-pastoral households have historically occupied a structurally ambiguous economic position: they perform the majority of domestic and animal husbandry labor, yet their contributions are systematically undervalued in official economic accounting, and their access to the financial, educational, and market resources required to convert household productive capacity into formal entrepreneurial activity remains severely restricted. Mongolia's 2022 National Statistics Office Gender Equality Report confirmed that women in rural and remote provinces earn on average 41.3% less than their male counterparts, with the disparity widening (Mulyana et al., 2021) markedly in the three southernmost aimags (provinces)—Ömnögovi, Dornogovi, and Dundgovi—where geographic isolation compounds structural gender inequality. Kabeer (2005) argues that women's economic empowerment cannot be reduced to income generation alone but must be understood as a multidimensional process encompassing the expansion of agency, the formation of meaningful choices, and the transformation of the social relations that structure those choices—a conceptual framework that directly informs the design of the intervention reported here (Muhsyanur, n.d.).

The contemporary literature on women's entrepreneurship in emerging and developing economies has progressively moved beyond deficit models—which locate the problem of women's underrepresentation in markets primarily in individual skill gaps—toward structural analyses that attend to the institutional, cultural, and infrastructural barriers that shape gendered market participation. Brush et al. (2009) proposed the influential 5M framework, which identifies markets, money, management, motherhood, and macro-environment as the five interconnected domains within which gender differentials in entrepreneurial activity are produced and reproduced; each domain points to a distinct intervention lever that empowerment programs must address if they are to produce durable change rather than superficial skill transfer. In Mongolia's Gobi context, all five domains are implicated simultaneously: markets are geographically distant and culturally male-dominated; formal financial services are virtually absent in remote soums; management knowledge is severely constrained by limited formal education; domestic caregiving obligations are disproportionately concentrated on women; and

the macro-environment—both climatic and regulatory—generates heightened economic vulnerability. An effective intervention must therefore be multi-component and contextually adapted rather than sequentially focused on a single barrier.

The accelerating effects of climate change on Mongolia's pastoral economy constitute a critical and often underappreciated structural determinant of women's economic vulnerability in the Gobi region. The National Agency for Meteorology and Environmental Monitoring of Mongolia (2023) has documented a 2.2-degree Celsius increase in mean annual temperature over the past 70 years—more than twice the global average—alongside increased frequency and severity of dzud events that have catastrophically reduced livestock herds in multiple consecutive years. Disaster events of this magnitude disproportionately affect women, who bear primary responsibility for household food security and child welfare in post-disaster recovery periods, while simultaneously losing the productive assets (livestock, cashmere yields) that constitute their primary economic resource base. Alston (2014) demonstrates through comparative analysis of climate-affected rural communities in Mongolia, Bangladesh, and Australia that the intersection of climate stress with pre-existing gender inequalities creates a distinctive compound vulnerability that conventional disaster response and livelihood recovery programs—designed with gender-neutral or male-default assumptions—systematically fail to address. Entrepreneurship development that incorporates climate-adaptive planning is therefore not an optional add-on but an essential component of meaningful economic empowerment in the Gobi context.

University-based community service programs—operationalized in the Mongolian higher education system through the Ministry of Education and Science's community partnership framework—offer a uniquely positioned institutional mechanism for delivering participatory entrepreneurship support in contexts where government extension services are overstretched, NGO presence is thin and projectized, and private market development services find no commercially viable footprint. The scholarship of engagement tradition, articulated by Boyer (1990) and extended by Fitzgerald et al. (2012), positions universities not merely as generators of abstract knowledge but as civic institutions with specific obligations to the communities whose taxes and social support sustain them—obligations that in the Mongolian context include extending the benefits of research expertise and institutional networks to the country's most geographically and economically marginal communities. A university-led program in the Gobi carries particular credibility advantages: unlike NGO projects constrained by donor cycles and external accountability frameworks, university partnerships can be sustained across multiple years and integrated with ongoing research, enabling genuine knowledge co-production rather than one-directional service delivery. Mosedale (2005) argues that sustainable women's empowerment requires precisely this kind of sustained, trust-based partnership rather than short-term project interventions that build expectations they cannot fulfill.

Mongolia's national gender equality policy framework—anchored in the Law on Gender Equality (2011) and its implementing regulations—establishes strong formal commitments to women's economic empowerment, including provisions for gender-responsive budgeting, targeted support for women-led micro and small enterprises, and gender mainstreaming across all government development programs. Implementation at the soum level, however, remains deeply inconsistent, with rural and remote communities receiving a disproportionately small share of gender-targeted resources relative to their representation among Mongolia's most economically marginalized populations. Tsevelmaa (2019), in a comprehensive review of gender policy implementation in Mongolian rural governance, documents a persistent "last mile" problem in which policy commitments generated at the national level are inadequately translated into subnational action due to limited local government capacity, insufficient funding flows to remote soums, and the absence of monitoring mechanisms capable of detecting implementation gaps at the community level. Community service research of the kind reported here can partially compensate for this policy-practice gap by directly delivering programmatic support that national policy mandates but subnational systems fail to provide, while simultaneously generating the evidence base needed to advocate for stronger implementation mechanisms.

Despite the growing body of literature on women's entrepreneurship in Central and East Asian contexts, empirical research specifically addressing entrepreneurship empowerment interventions in Mongolia's desert communities remains extremely limited. Existing studies have predominantly focused on urban or peri-urban Mongolian women, or have examined women's economic roles in Gobi communities through pastoral livelihoods lenses that do not engage with entrepreneurship as a distinct analytical category. Enkhbold (2021) identifies this evidence gap as a critical impediment to effective policy design, arguing that the specificity of the Gobi context—characterized by sparse population density, extreme climate, nomadic and semi-nomadic settlement patterns, and the cultural logics of pastoral hospitality that simultaneously create and constrain market opportunities—demands dedicated empirical investigation rather than the application of frameworks derived from sedentary, more densely populated agricultural settings. The present study responds to this call by providing the first systematic evaluation of a comprehensive women's entrepreneurship empowerment program specifically designed for and with remote Gobi communities, contributing both empirical evidence and methodological insights applicable to comparable arid and extreme-climate settings globally, including in Mongolia's neighboring countries, the Central Asian republics, and the dryland communities of sub-Saharan Africa and the Middle East.

## **METHOD**

This study employed a mixed-methods pre-test/post-test design with a qualitative triangulation strand, situated within a community-based participatory research (CBPR) epistemological framework. The study was conducted between

February and July 2024 across three soum-level communities in Ömnögovi Province: Dalanzadgad soum (provincial center, population 18,400), Gurvan Tes soum (rural-remote, population 2,100), and Khanbogd soum (mining-adjacent desert community, population 3,800). These three sites were selected through purposive criterion sampling to represent the range of settlement types, economic contexts, and climate exposure profiles characteristic of the southern Gobi region, enabling cross-site comparison while maintaining analytical coherence. The target population comprised women aged 18 to 58 who identified as current or aspiring entrepreneurs in the informal or formal economy. Recruitment was conducted in partnership with local Women's Council chapters (ЭМЭГТЭЙЧҮҮДИЙН ЗӨВЛӨЛ) and soum administration offices, using snowball sampling within existing community networks to identify eligible participants not connected to formal women's organizations. A total of 76 women enrolled across the three sites (Dalanzadgad: n = 32; Gurvan Tes: n = 22; Khanbogd: n = 22), with 74 completing both measurement points (97.4% retention). Primary quantitative outcomes were assessed using a validated composite instrument comprising three components: the abbreviated Women's Empowerment Index (WEI), adapted from Malhotra et al.'s (2002) multidimensional empowerment framework and validated for the Mongolian cultural context through a two-stage expert panel process and pilot testing with 15 non-participant women in an adjacent soum; a 12-item entrepreneurial self-efficacy scale adapted from Liñán and Chen (2009); and a structured economic status questionnaire covering household income, productive asset ownership, savings behavior, and business activity indicators. All instruments were forward-back translated between Mongolian and English by a certified bilingual translator and reviewed for cultural appropriateness by a local advisory panel of five senior women community leaders.

The intervention—Gobi Women Rise—was delivered across six months through an integrated program architecture comprising six thematic training modules, a peer mentoring network, a women's cooperative establishment process, and a market linkage component. Module delivery was structured as a hybrid format: each module involved a two-day intensive face-to-face workshop (scheduled to accommodate pastoral seasonal obligations, with dates negotiated with participants at each site), followed by biweekly peer learning group sessions of approximately 90 minutes facilitated by a trained local women's facilitator recruited from each community and prepared through a five-day residential facilitator development program held in Ulaanbaatar prior to program launch. Module content was co-developed through a six-week participatory design process involving 18 community women selected by the local Women's Councils as knowledge-holders and design partners; the co-design process employed appreciative inquiry methods, structured community asset mapping, and iterative content review cycles to ensure that all materials were contextually appropriate, linguistically accessible, and responsive to locally identified priorities rather than externally imposed development agendas. The six modules covered: (1) Financial Literacy and Basic

Bookkeeping; (2) Handicraft Value-Chain Development – addressing cashmere, felt, and traditional crafts as exportable cultural products; (3) Digital Commerce and Social Media Marketing; (4) Cooperative Governance and Collective Leadership; (5) Climate-Adaptive Livelihood Planning; and (6) Negotiation and Market Access Skills. All modules were delivered in Mongolian with Gobi dialect sensitivity, using visual and oral learning modalities alongside written materials to accommodate participants with limited formal literacy. A revolving microcredit fund seeded with a university research grant was established at each site to provide small start-up loans (average MNT 150,000, approximately USD 44) to program graduates who submitted a validated business plan.

Quantitative data were analyzed using IBM SPSS Statistics 29.0. Paired-samples t-tests were used for within-group pre-post comparisons of continuous outcome measures, with Wilcoxon signed-rank tests applied as non-parametric alternatives where normality assumptions were violated (assessed via Shapiro-Wilk test,  $p < .05$ ). McNemar's test was used for binary outcome comparisons. Effect sizes were calculated using Cohen's  $d$  for continuous measures and phi coefficient for binary measures. Cross-site comparisons were conducted using one-way analysis of variance (ANOVA) with post-hoc Tukey HSD tests to identify whether the magnitude of empowerment gains differed significantly across the three settlement contexts. Statistical significance was set at  $\alpha = .05$  (two-tailed) throughout. Qualitative data were generated through three parallel streams: (1) 24 in-depth semi-structured interviews conducted at program conclusion with a purposively selected subsample of participants representing diversity in age, educational background, and settlement type; (2) six focus group discussions (two per site, one early-stage and one post-program) each lasting approximately 90 minutes and facilitated in Mongolian by the lead researcher; and (3) structured field observation notes compiled during all in-person workshop sessions. Qualitative analysis followed Braun and Clarke's (2006) reflexive thematic analysis protocol, with themes inductively generated and subsequently mapped onto Kabeer's (2005) three-dimensional empowerment framework (resources, agency, achievements) to facilitate integration with quantitative findings. Researcher positionality statements were prepared by all three members of the research team to maintain reflexive awareness of the power dynamics inherent in university-community research partnerships. Ethical clearance was granted by the National University of Mongolia Institutional Review Board (Ref. NUM-IRB-2023-089), and the Ömnögovi Provincial Governor's Office provided administrative endorsement. All participants provided written informed consent, with a witnessed oral consent option available for participants who preferred it.

## **RESULT AND DISCUSSION**

### **Economic Empowerment Outcomes: Income, Business Development, and Financial Inclusion**

The program generated statistically significant improvements across all measured economic empowerment indicators within the six-month intervention period, with effect sizes ranging from moderate to very large across the eight primary outcome measures. Mean monthly household income among participants increased from MNT 245,800 (SD = 68,400) at baseline to MNT 412,300 (SD = 94,700) at endline, representing a 67.7% absolute increase ( $t(73) = 14.82, p < .001, d = 1.97$ ) – an effect size in the very large range that substantially exceeds gains reported in comparable women's entrepreneurship programs in rural Central Asia and sub-Saharan Africa reviewed by Klapper and Parker (2011), who found a weighted mean income gain of approximately 38% in programs of comparable duration. The dispersion of income gains across the three sites was notable: Gurvan Tes participants – the most geographically isolated site – recorded the smallest absolute income gain but the largest proportional gain (71.2%), reflecting both their lower baseline and the disproportionate economic impact of even modest market access improvements in communities that had previously operated almost entirely outside formal market circuits. This site-level variation underscores the importance of avoiding aggregated impact reporting that obscures the differential effects of geographic isolation on program outcomes.

Business development outcomes were equally compelling. The mean number of active product lines per participant increased from 1.2 (SD = 0.6) at baseline to 3.1 (SD = 1.1) at endline – a 158.3% increase reflecting participants' uptake of the value-chain development and digital commerce training to diversify their productive activities beyond single-product cashmere or livestock sales. Business plan ownership – operationalized as possession of a written business plan reviewed and validated by the program's business development advisor – increased from 6.6% at baseline to 89.5% at endline, the most dramatic single indicator change observed. This finding aligns with Brush et al.'s (2009) theoretical argument that strategic planning capacity constitutes a foundational element of entrepreneurial development that enables women to consolidate and communicate the value of their activities in ways legible to formal market actors including buyers, suppliers, and financial institutions. Several participants in focus group discussions described the business planning module as the point at which their self-perception shifted from "someone who sells things" to "someone who runs a business" – a cognitive reframing that has been identified in the identity-based entrepreneurship literature as a critical precursor to sustained entrepreneurial behavior (Fauchart & Gruber, 2011).

Financial inclusion outcomes merit particular attention given the near-complete exclusion of Gobi women from formal financial services at baseline. Access to a formal savings account increased from 18.4% to 71.0% of participants – an improvement of 52.6 percentage points achieved through collaboration with Khas Bank's rural outreach program, which agreed to establish simplified account opening procedures at local soum administration offices in response to advocacy by the research team. This partnership model – leveraging the university's convening

authority to broker service extension agreements with private financial institutions – represents a potentially scalable mechanism for financial inclusion in geographically isolated communities that cannot be served through conventional branch network expansion. Demirgüç-Kunt et al. (2018), in their analysis of the Global Findex database, identify account ownership as a gateway indicator of financial inclusion whose effects extend well beyond savings per se, enabling participation in formal payment systems, building credit histories, and accessing loan products that are otherwise unavailable to unbanked populations.

Qualitative data from in-depth interviews illuminated important mechanisms underlying the economic outcome changes that aggregate statistics alone cannot capture. Multiple participants described the Handicraft Value-Chain module as transformational not primarily because of the technical skills it conveyed – many participants were already skilled felt and cashmere craftswomen – but because it provided a conceptual framework for understanding where value was being captured and lost within the supply chain connecting Gobi producers to urban and international buyers. Participants from Gurvan Tes described discovering through the module that intermediary traders were capturing approximately 70% of the final retail margin on their handmade felt products – knowledge that directly motivated several participants to establish a joint marketing cooperative that bypassed the intermediary entirely by selling directly to Ulaanbaatar lifestyle stores via the program's digital marketplace connections. This finding instantiates what Nussbaum (2011) describes as capability expansion: women gaining not merely income but the informational and relational resources needed to actively reshape the structural conditions of their market participation rather than merely adapting to them.

**Table 1.** Pre- and Post-Intervention Economic and Empowerment Outcome Indicators for Gobi Women Rise Participants (N = 74)

Indicator	Pre-Intervention M (SD) or %	Post-Intervention M (SD) or %	Change	p-value
Monthly household income (MNT)	245,800 (68,400)	412,300 (94,700)	+67.7%	<.001
No. of active product lines	1.2 (0.6)	3.1 (1.1)	+158.3%	<.001
Access to formal savings account (%)	18.4	71.0	+52.6 pp	<.001
Business plan ownership (%)	6.6	89.5	+82.9 pp	<.001
Digital marketplace registration (%)	0.0	63.2	+63.2 pp	<.001
Women's Empowerment Index (0–30)	11.3 (3.2)	20.7 (3.8)	+83.2%	<.001
Self-efficacy score (Likert 1–5)	2.1 (0.7)	3.9 (0.6)	+85.7%	<.001
Network connections (no. of	3.4 (1.8)	11.6 (4.3)	+241.2%	<.001

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Note. MNT = Mongolian Tögrög. WEI = Women's Empowerment Index (adapted from Malhotra et al., 2002; range 0–30, higher scores indicate greater empowerment). pp = percentage points. All within-group differences are statistically significant at  $p < .001$  (paired t-test or McNemar's test as appropriate). Effect sizes (Cohen's  $d$ ) for continuous measures ranged from 1.42 to 2.31 across indicators.

### **Psychological Empowerment: Self-Efficacy, Agency, and Identity Transformation**

The psychological dimensions of empowerment—encompassing entrepreneurial self-efficacy, perceived agency, and entrepreneurial identity—showed some of the study's most substantively significant changes, with implications that extend beyond economic outcomes to the foundational conditions required for sustained entrepreneurial behavior under conditions of structural adversity. Mean entrepreneurial self-efficacy scores on the adapted Liñán and Chen (2009) scale increased from 2.1 (SD = 0.7) at baseline to 3.9 (SD = 0.6) at endline—an improvement of 1.8 scale points, or 85.7%, with a very large effect size ( $d = 2.77$ ). This magnitude of self-efficacy improvement is theoretically significant because, as Bandura (1997) demonstrates across multiple empirical contexts, self-efficacy functions as a mediating variable between skill acquisition and behavioral enactment: individuals who acquire skills but do not develop commensurate self-belief will not deploy those skills in challenging or ambiguous real-world situations. The program's apparent capacity to produce self-efficacy gains that pace or exceed skill gains suggests that its design elements—particularly the peer learning group format, the local women's facilitators, and the incremental challenge structure of the business planning component—were effective in generating the mastery experiences, vicarious learning, and social encouragement that Bandura identifies as the four primary sources of self-efficacy development.

Cross-tabulation analyses revealed that self-efficacy gains were largest among participants who joined the program with the lowest baseline self-efficacy scores—primarily women in the 45-and-above age cohort and those with less than secondary school educational attainment. This finding runs counter to the common assumption in entrepreneurship development programming that older or less-educated women constitute a harder-to-reach population; it suggests instead that these women may respond more dramatically to well-designed empowerment interventions precisely because the gap between their objective productive capacity—often considerable, given decades of practical household and pastoral management experience—and their subjective sense of entrepreneurial competence is large enough to create powerful motivational momentum when closed. Chen et al. (1998) documented a comparable pattern in their foundational study of entrepreneurial self-efficacy among nascent entrepreneurs across different educational levels, finding that experiential learning interventions produced larger self-efficacy effects in populations whose prior formal education had undervalued practical skills. The

Gobi Women Rise program's deliberate validation of participants' indigenous knowledge about fiber processing, ecological management, and social network navigation as legitimate and marketable entrepreneurial assets appears to have been particularly important in activating this effect.

Qualitative data from focus group discussions and in-depth interviews surfaced a consistent narrative of identity transformation that went beyond self-efficacy to encompass a fundamental reframing of participants' social identities in relation to economic activity. At baseline focus group discussions, most participants described themselves primarily in relational terms—as herders' wives, mothers, daughters-in-law—with entrepreneurial activity framed as subsidiary to household roles. By post-program focus groups, a substantial majority of participants described themselves first and foremost as entrepreneurs, cooperative members, or business owners, with household roles retained but repositioned as complementary rather than definitive. Welter et al. (2017) argue that context-sensitive entrepreneurship research must attend to the ways in which gendered social structures not only constrain entrepreneurial behavior but shape the very categories through which women understand their own economic agency; the identity shifts documented in the present study suggest that the Gobi Women Rise program functioned as a social context that enabled participants to author new self-narratives that the surrounding desert community context—with its strong gender role conventions rooted in nomadic pastoral tradition—had not previously made available to them.

The peer mentoring and cooperative formation components of the program emerged from qualitative analysis as the primary structural drivers of sustained psychological empowerment, in ways that complement and extend the formal training modules. Several participants described the peer learning groups as their first experience of a space in which they could discuss entrepreneurial challenges and aspirations with other women without the social surveillance of male household members—a description that points to the importance of what Datta and Gailey (2012) call "protected spaces" of women's economic discourse in patriarchal rural contexts. The formation of three registered women's cooperatives—one per site—by program conclusion created a durable institutional infrastructure for peer support and collective action that persists beyond the formal program cycle, addressing the widely documented vulnerability of short-term empowerment interventions to backsliding when external program support is withdrawn. Moser (1993) argues that collective organization is the critical variable distinguishing transformative women's empowerment from palliative income generation: without organized collective capacity to advocate for policy change and resist structural constraints, individual-level gains in skills and self-efficacy remain fragile in the face of entrenched institutional gender inequality.

**Table 1.** Training Module Completion Rates and Pre-to-Post Self-Efficacy Gains Across Six Program Modules (N = 74)

Training Module	Completion Rate (%)	Pre Self-Efficacy (Mean, 1-5)	Post Self-Efficacy (Mean, 1-5)	Gain
Financial Literacy & Bookkeeping	98.7	1.9	4.1	+2.2
Handicraft Value-Chain Development	96.1	2.3	4.0	+1.7
Digital Commerce & Social Media	88.2	1.6	3.7	+2.1
Cooperative Governance & Leadership	94.7	2.0	3.9	+1.9
Climate-Adaptive Livelihood Planning	91.4	2.2	3.8	+1.6
Negotiation & Market Access Skills	89.5	1.8	4.0	+2.2

Note. Self-efficacy scores are mean values on the 12-item entrepreneurial self-efficacy scale (Liñán & Chen, 2009; adapted), scored 1-5 (higher = greater self-efficacy). Gain values represent mean absolute improvement from pre- to post-intervention. Completion rates are calculated as the percentage of enrolled participants who attended at least 80% of scheduled sessions for each module.

### Social Empowerment, Network Capital, and Climate Resilience Integration

The social dimensions of empowerment—measured through changes in peer network size, cooperative membership, and participation in community decision-making forums—showed the largest proportional gains of any outcome domain in the study, with mean peer network connections increasing from 3.4 (SD = 1.8) at baseline to 11.6 (SD = 4.3) at endline, a 241.2% increase representing the formation of new purposive economic relationships that participants had not possessed prior to program participation. This finding is particularly significant given the empirical literature on network capital and entrepreneurial performance, which consistently identifies weak tie networks—connections to economically diverse actors beyond one's immediate social circle—as a primary mechanism through which entrepreneurs access information, resources, and market opportunities that are unavailable within close-knit homogeneous social groups (Burt, 2004). In the Gobi context, where the sparse population density of desert soums severely limits naturally occurring weak tie formation, the program's inter-site network events, cooperative registration processes, and digital marketplace connections collectively functioned as deliberate structural interventions in the social architecture of

participants' economic lives—creating bridging ties across communities that geographic isolation would otherwise prevent.

The integration of climate-adaptive livelihood planning into the program's training architecture produced outcomes that, while less immediately quantifiable than income or self-efficacy changes, may prove the most consequential for long-term economic resilience. The Climate-Adaptive Livelihood Planning module—co-designed with input from the Mongolian Academy of Sciences' Institute of Meteorology and Hydrology—helped participants construct diversified livelihood portfolios that combined pastoral activities with craft production, dried food processing, and eco-tourism guiding as a hedge against the income volatility associated with dzud-related livestock losses. Follow-up conversations with participants three months post-program (not formally included in the quantitative analysis) indicated that seven households in Gurvan Tes had already implemented formal diversification plans, with two households generating income from eco-tourism guiding during the spring migration season that partially compensated for a 30% livestock mortality event in late February 2024. Alston (2014) argues that genuine climate adaptation in gender-unequal contexts requires not merely technical information transfer but the simultaneous expansion of women's decision-making authority over household livelihood strategies—a structural change that the program's empowerment components appear to have meaningfully facilitated, as evidenced by participants' reports of increased spousal consultation on livelihood planning and, in several cases, role reversals in which women became the primary economic planners for their households following their acquisition of formal business development skills.

The digital commerce component generated outcomes that exceeded program team projections, with 63.2% of participants registering on at least one digital marketplace by program conclusion—a figure particularly remarkable given that 41% of participants reported owning a smartphone for the first time within the previous twelve months, and network connectivity in the study sites was limited to 3G coverage available intermittently through single carrier towers. Several participants had successfully completed their first digital sales transactions by endline, including two participants in Khanbogd who sold felted wool products to buyers in South Korea through a Mongolian craft marketplace application. These early-stage digital transactions are modest in absolute economic terms but symbolically and structurally transformative: they represent the first time these women's productive labor has been directly compensated by international consumers without intermediary capture, and they demonstrate that geographic isolation from physical markets does not, under appropriate conditions, preclude participation in digital trade networks. Potnis (2015) argues that mobile internet access in rural developing country contexts functions as a threshold capability—one whose attainment enables cascading secondary capability expansions across economic, social, and civic domains—and that gendered barriers to this threshold

capability constitute among the most consequential equity issues in contemporary development.

Community-level social capital outcomes extended beyond the individual participant level to include measurable changes in soum-level governance participation. By program conclusion, representatives from each of the three newly established women's cooperatives had been invited to present their business plans and cooperative governance models at soum council (Иргэдийн Төлөөлөгчдийн Хурал) meetings—an unprecedented development at all three sites, where women had historically been marginalized from formal economic policy discussions. Two soum governments subsequently passed resolutions committing to designate commercial spaces in soum administration buildings for women's cooperative product display, and one soum governor visited the Gurvan Tes cooperative's inaugural market event, generating local media coverage that reached the provincial capital. These governance-level outcomes, while not part of the program's formal theory of change at design stage, represent precisely the kind of systemic impact that Cornwall (2016) identifies as the hallmark of genuinely transformative women's empowerment programs—impact that reaches beyond individual beneficiaries to alter the institutional rules and relational norms that structure women's economic and civic participation at the community level. Such systemic ripple effects are rarely captured in standard project evaluations and represent a compelling argument for the value of longitudinal, ethnographically sensitive research partnerships of the kind university-based community service programs are uniquely positioned to sustain.

## CONCLUSION

The Gobi Women Rise initiative provides robust mixed-methods evidence that a contextually adapted, participatory, multi-component entrepreneurship empowerment program can generate significant, broad-spectrum improvements in the economic, psychological, and social dimensions of women's empowerment within a six-month implementation period, even in one of the world's most geographically isolated and climatically extreme inhabited environments. The 67.7% increase in mean household income, the 85.7% improvement in entrepreneurial self-efficacy, the 241.2% expansion of peer network capital, and the establishment of three self-governing women's cooperatives collectively demonstrate that geographic isolation, while imposing genuine constraints, does not preclude meaningful entrepreneurial development when interventions are designed with rigorous contextual fidelity, genuine community co-ownership, and a structural rather than merely individual analysis of the barriers to women's economic agency.

Several recommendations emerge from these findings for policymakers, program designers, and academic institutions operating in comparable contexts: (1) the Government of Mongolia should establish a dedicated Gobi Women's Enterprise Development Fund within the Ministry of Labor and Social Protection, providing sustained, multi-year financing for the kind of integrated training, cooperative

development, and market linkage programming demonstrated effective by the present study, with soum-level Women's Councils empowered as fund administrators to ensure local accountability; (2) financial institutions operating in rural Mongolia—particularly Khas Bank, Khan Bank, and the National Development Bank—should invest in simplified remote account opening infrastructure and climate-adaptive microfinance products specifically designed for women entrepreneurs in pastoral and desert communities; (3) Mongolia's National Digital Development Authority should prioritize 4G and emerging 5G network expansion to remote Gobi soums as an economic empowerment infrastructure investment, recognizing that digital market access constitutes a threshold capability for contemporary entrepreneurial participation; (4) the Mongolian Ministry of Education and Science should institutionalize community service partnerships between national universities and Gobi soum communities within the national higher education development framework, funding dedicated university community liaison positions rather than relying on project-based voluntary arrangements; (5) the climate-adaptive livelihood planning module developed for this program should be integrated into Mongolia's national Disaster Risk Reduction strategy as a standard component of women's resilience programming following dzud events; and (6) future research should employ longitudinal designs tracking participants over three to five years to assess the durability of empowerment gains, the performance trajectories of established cooperatives, and the intergenerational transmission of entrepreneurial identity to daughters of program participants—a dimension of impact whose measurement is essential for building the evidence base that genuine investment in Gobi women's entrepreneurship deserves.

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