Food and Agriculture Organization of the United Nations

Analyzing Resilience for better targeting and action

The resilience capacity of Mongolian herder households has been determined for the first time using the Resilience Index Measurement and Analysis (RIMA) tool

RESILIENCE CAPACITY ANALYSIS OF MONGOLIAN HERDER HOUSEHOLDS

ANALYSING RESILIENCE FOR BETTER TARGETING AND ACTION

FAO resilience analysis report **No. 1**

RESILIENCE CAPACITY ANALYSIS OF MONGOLIAN HERDER HOUSEHOLDS

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The resilience capacity analysis of Mongolian herder households using the RIMA was first conducted under the UN Joint Programme on “Expanding Social Protection to Herders with Enhanced Shock Responsiveness” with the aim of providing the evidence needed to better understand and support Mongolian herder households based on what they need most.

Cover photo: © FAO Mongolia

CONTENTS

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ACRONYMS

AA	Anticipatory Action
ABS	Access to Basic Services
AC	Adaptive Capacity
AST	Assets
CMP	Child Money Programme
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
FA	Factor Analysis
FAO	Food and Agriculture Organization of the United Nations
FSIN GoM	Food Security Information Network Government of Mongolia
HDP	Humanitarian Development Peace
HHs	Herder households
HQ	Headquarters
IBLI	Index Based Livestock Insurance
ILO	The International Labour Organization
JRS	Joint Resilience Strategy
LLU	Large Livestock Unit
MNT	Mongolian Tugriks
MoFALI	Ministry of Food, Agriculture and Light Industry
MoLSP	Ministry of Labour and Social Protection
NEMA	National Emergency Management Agency
NGOs	Non-Government Organizations
NSO	National Statistics Office
NSPS	National social protection systems
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OECD	Organisation for Economic Co-operation & Development
RAP	FAO Regional Office for Asia and Pacific
RCI	Resilience Capacity index
RCP	Representative Concentration Pathway
RIMA	Resilience Index Measurement Analysis
RM-TWG	Resilience Measurement Technical Working Group
RSM	Resilience structure matrix
SAEFP	State Agency for Environment and Forestry
SDGs	Sustainable Development Goals
SP	Social Protection
SRSP	Shock-Responsive Social Protection
SSN	Social Safety Nets
TANGO	Technical Assistance to NGOs
UNFPA	The United Nations Population Fund
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNJP	United Nations Joint Programme
USAID	United States Agency for International Development
USD	United States dollars
WFP	World Food Programme

1 BACKGROUND AND OBJECTIVE OF THE ANALYSIS

BACKGROUND AND OBJECTIVE OF THE ANALYSIS

1.1 General context

Climate change projections show more frequent and intense climate shocks, but there is also a high level of uncertainty associated with climate change. Shocks and crises have come to play a large and growing role in determining the outcomes of the lives of individuals and their families, disproportionately affecting the poorest and most vulnerable.

Over the past decade, economic damages resulting from natural hazards have amounted to USD 1.5 trillion (caused by geophysical hazards such as earthquakes, tsunamis, and landslides, as well as hydro-meteorological hazards, including storms, floods, droughts, and wildfires). Funding requirements for humanitarian crises increased six fold from USD 3.4 billion in 2004 to nearly USD 19.5 billion in 2015. Due to the COVID-19 pandemic, the crises have been exacerbated, as of 31 December 2021, adjusted requirements for 45 appeals were $37.7 billion to assist 174 million of the 250 million most vulnerable people who face hunger, conflict, displacement, the impacts of climate change and the COVID-19 pandemic in need in 59 countries (OCHA, 2022).

Worldwide, 75 percent of poor and food insecure people rely on agriculture and natural resources for their living. They are usually hardest hit by disasters (FAO).

Resilience is becoming influential in development and vulnerability reduction sectors such as social protection, disaster risk reduction and climate change adaptation.

Sustainable development cannot be achieved without resilient livelihoods. In particular, zero hunger, environmental conservation, climate change adaptation and sustainable economic development cannot be achieved without resilient agricultural livelihoods.

Therefore, humanitarian and development communities have put the resilience of agricultural livelihoods at the top of their agendas through five major global policy processes: the Sendai Framework for Disaster Risk Reduction, the Paris Climate Agreement; the One Health approach; the Committee on Food Security Framework for Action and the Agenda for Humanity of the World Humanitarian Summit, for delivering the 2030 Sustainable Development Goals.

The 2030 Agenda incorporates the importance of promoting efforts by countries to “build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters” (Goal 1, SDG, 2015); and to take urgent action to “strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries”; and integrating “climate change measures into national policies, strategies and planning” (Goal 13, SDG, 2015).

At the same time, the 2030 Agenda for Sustainable Development clearly points toward the creation of social protection systems that allow all people to enjoy basic standards of living.

The Paris Agreement, within the United Nations Framework Convention on Climate Change (UNFCCC), also recognizes adaptation as a key component in the long-term global response to climate change to protect people, livelihoods, and ecosystems.

Well-designed responses through national systems, and especially social protection, can improve efficiency. Social Protection's core mandate is to address poverty and vulnerability – no matter how these needs are generated. Whilst Disaster Risk Management (DRM) and Humanitarian sectors also aim to mitigate or respond to needs driven by a shock. All three sectors are trying to address the needs of a household.

Existing social protection efforts are complemented by access to essential social services and by access to productive services that promotes graduation out of poverty through vocational training and income generation activity. Such integrated approaches can significantly contribute to achieving resilience outcomes with considerations of climate and disaster risks and implemented in close synergy with programmes on sustainable and resilient livelihoods, early warning systems, and financial inclusion.

Acting ahead of a disaster is critical—it can protect lives and livelihoods, increase resilience to future shocks, and relieve pressure on limited humanitarian resources. However, a rapid but operationally slow response can disrupt food systems and livelihoods. Therefore, advance planning is critical for Anticipatory Action (AA). Thus, AA integrated with and delivered through Social Protection (SP) systems is part of Shock-Responsive Social Protection (SRSP), albeit with a unique set of challenges and considerations associated with providing assistance or services before a covariate shock occurs.

> *"Shock-responsive social protection is a term used to bring focus on shocks that affect a large proportion of the population simultaneously (covariate shocks). It encompasses the adaptation of routine social protection programmes and systems to cope with changes in context and demand following large-scale shocks. This can be ex ante by building shock-responsive systems, plans and partnerships in advance of a shock to better prepare for emergency response; or ex post, to support households once the shock has occurred. In this way, social protection can complement and support other emergency response interventions (...)"*

Source: European Commission. 2019. "Social Protection across the Humanitarian-Development Nexus. A Game Changer in Supporting People through Crises". Tools and Methods Series No. 26. European Commission

The most appropriate approach is to design SRSP based on analysis of prevention and rehabilitation aftershocks and crises. For households with low resilience, even small changes can be devastating.

Evidence shows that taking action before a predicted shock to protect agricultural livelihoods can help avoid disaster losses that are up to seven times the initial investment.

A strategic shift from responding to recurring and predictable hazards to anticipating their impact can break the vicious circle of growing reliance on humanitarian assistance and support resilience efforts. That is the guiding principle of Anticipatory Action (AA), a kind of defensive programming that uses a humanitarian and resilience infrastructure to protect development gains and investments. An increasing number of stakeholders and national governments around the world are now using this approach to protect people from climate and human-induced hazards. Linking AA to national social protection systems (NSPS) can also be an effective way to strengthen coordination between humanitarian actors and national governments and make NSPS more shock-responsive. It is always seen as a way to integrate the anticipatory approach into national policies, bridge the Humanitarian Development Peace (HDP) divide, and promote a more efficient, effective, and sustainable way of managing shocks.

1.2 Country profile

Mongolia is a large landlocked country covering an area of 1,564,116 square kilometres, located on the North Central Asian high plateau, and is the world's most sparsely populated sovereign nation. According to the National Statistical Office (NSO) of Mongolia, the population of the country at the end of 2021 was 3.4 million people. The climate is extremely continental with short dry summers and long cold winter seasons.

Administratively and territorially, the country is divided into 21 aimags (provinces) and the capital Ulaanbaatar. Aimags are subdivided into soums (districts), and soums are further subdivided into baghs. The capital Ulaanbaatar consists of 9 municipal districts, 6 of which are located outside the city.

The agricultural sector is the second largest economic pillar of the country after the mining sector, which accounted for 13.3% of GDP in 2021. The contribution of the livestock sector to the agriculture GDP is about 90%. Approximately 30 percent of the workforce is directly dependent on the livestock sector. According to national statistics, by the end of 2020, there were 67.3 million heads of livestock in 243,023 households, of which 181,051 are herder households whose livelihoods are directly dependent on livestock.

The main livestock species in the country are horses, camels, cattle including yak, sheep and goats, kept mainly in an extensive livestock production system with four seasons of grazing areas. The sustainable carrying capacity of the total grassland area is about 25 million head of livestock. Overstocking and overgrazing, together with the adverse impact of climate change, have resulted in rangeland degradation.

Climate change has intensified over the past 80 years in Mongolia, with the average air temperature increasing by 2.25 degrees Celsius, which is twice the global average. More than three-quarters of the entire territory of the country is subject to desertification to some extent, and half of the total area is already classified as heavily desertified. Permanent pastures and meadows occupy about 110.5 million hectares, which is 71.8% of the total territory of Mongolia, with estimated carbon sequestration of 400 million tons, but currently 65% of which have already degraded to some extent.

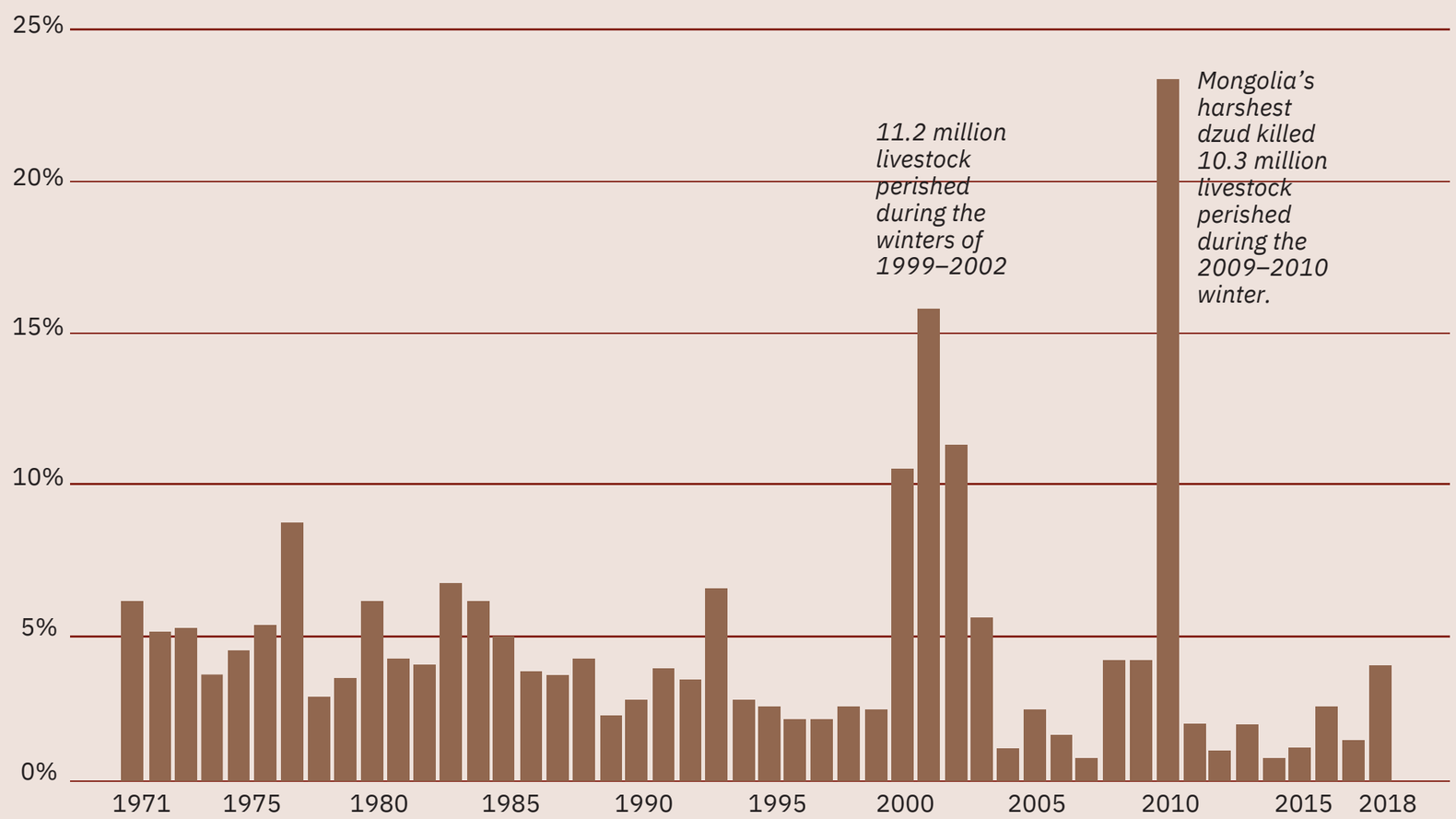
Economic changes have made things even tougher. In the transition to a free market system, the abolition of controlled herd sizes fuelled overgrazing. Exports declined and the meat, animal skin and hide processing industries are collapsing. Many herders narrowed their income base to focus on raising goats for cashmere. But when prices fell, herders bought more animals to stabilize their incomes, leading in turn to more overgrazing.

The extreme climate, combined with the dependency on grassland makes this system inherently vulnerable to climatic and natural resource man agement risks and climate change. The frequen cy, intensity, unpredictability, and magnitude of climate and weather extremes such as harsh winter (dzud), drought, snow and dust storms, heavy rainfall and flooding have tripled in the last decade, and thereby climate change has tremendous impacts on traditional livestock-based livelihoods.

The Government of Mongolia defines a DZUD condition as a deterioration of the weather conditions in winter and spring, leading to a shortage of pasture and water for livestock suffering massive die-off. The severe winter conditions are often preceded by dry summers, exacerbating the situation.

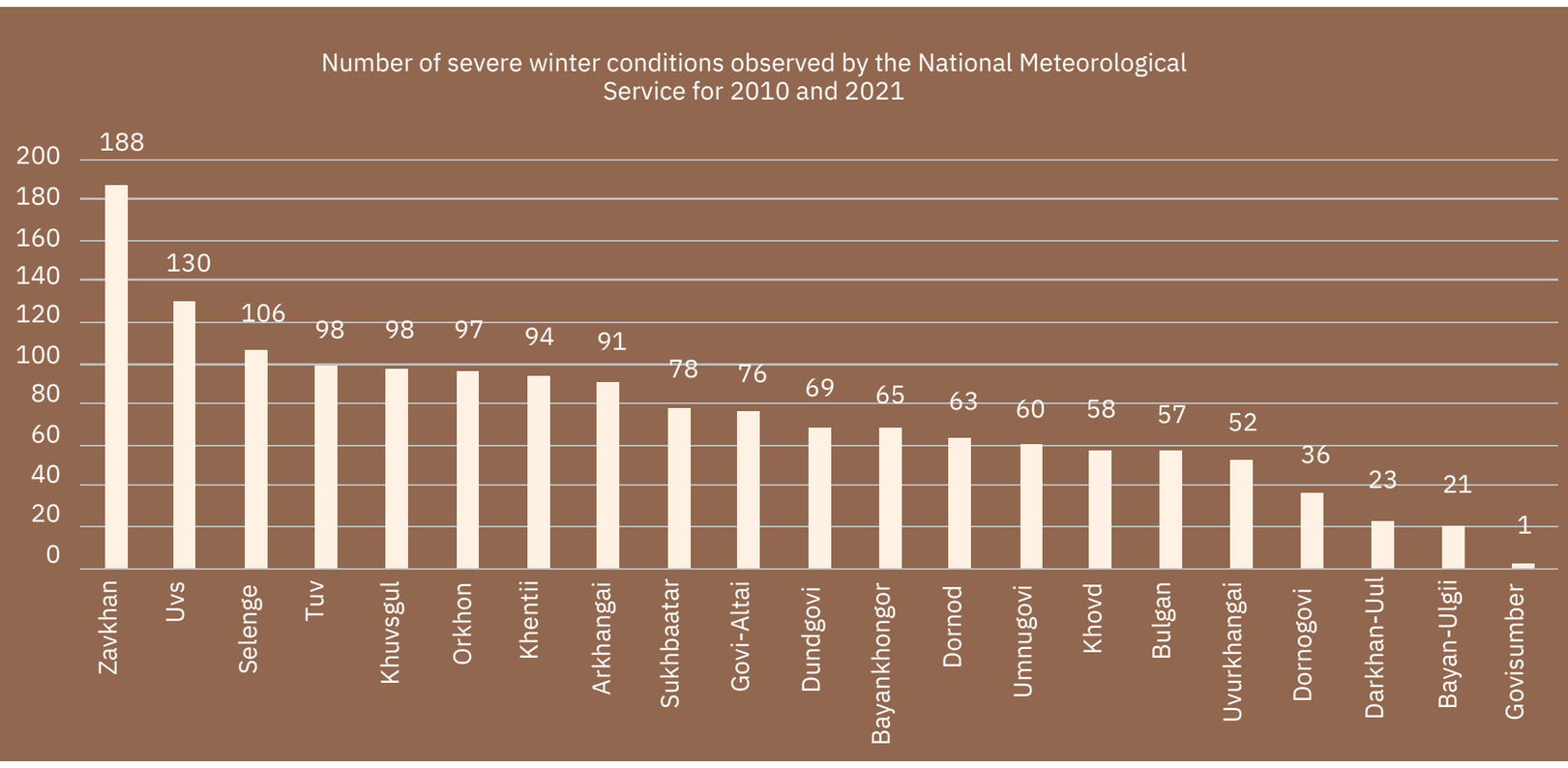
Dzud is a severe covariate shock that directly affects the livelihoods of herder households (who make up about a third of the population) and indirectly influences the social-economic status of the country. In 1999–2000, 2000–2001, and 2001–2002, Mongolia was hit by three dzuds in a row, causing the mortality of 25% of the national herd. This period also coincided with extreme dry spells and summer droughts and more than 12,000 herder households lost their entire livelihood assets, while thousands more were pushed to subsistence levels below the poverty line by the loss of herds. In the 2009–2010 dzud, about 10.3 million livestock died which was approximately 25% of the country's livestock population – affecting 769,000 people or 28% of Mongolia's total population.

According to the Red Cross, 220,000 herding households were affected of which 44,000 households lost all of their livestock and 164,000 lost more than half their herd.



The Third National Communication (2018) reported that the frequency of dzud has increased since the 1990s and is projected to increase by 5–20% under the RCP 4.5 scenario by 2080.

According to the Ministry of Food, Agriculture and Light Industry, from 2010 to 2021, there are 1,472 severe winter conditions were observed by the National Meteorological Service, as the graph shows that Zavkhan and Uvs provinces are the most prone to dzud.



Source: The State Emergency Service for Food and Agriculture, MoFALI

As an impact of complexities, rural to urban migration has created yet another challenge. As herders' livelihoods are devastated by the cumulative effects of the dzuds and by the high-interest loans they take out to survive, many move to the cities. Already destitute, they now live in shacks and yurts on the outskirts, devoid of working infrastructure, burdened by social problems, and unable to break out of the vicious downward cycle of poverty.

Natural disasters not only create serious hardships for men and women in the short term but this type of risk also likely retard the development process. Given that there are few coping mechanisms other than informal family arrangements, the high level of uncertainties likely adds to the risk-averse behavior in poor herder families.

The impact of COVID-19 undoubtedly exacerbated some social and economic challenges, stressing the challenges of an economy that is highly dependent on exportsectors and very vulnerable to external economic shocks.

For more than 70 years, under a centrally planned economy, the Mongolian social protection system had nearly 100 percent of coverage and a comprehensive set of benefits including medical care, maternity benefits, pensions, and other provisions. Following the country's transition to a market economy, this reality has changed.

The social protection system of Mongolia currently consists of 3 key elements: social welfare services and assistance (inherited from the socialist time), social insurance (introduced in 1995 by having both employer and employee contributing to the social insurance system), and employment promotion programmes (launched in 2001). Five social insurance programmes are in place: pension, welfare, health, occupational accident and health, and unemployment insurance, with both compulsory and voluntary schemes. The old-age pension system combines compulsory and voluntary contributory schemes. The law on Pensions and Benefits from Social Insurance Funds makes provision for a defined benefit scheme. All persons under a labour contract (in the private or public sector) are covered by compulsory social insurance. Herders, informal workers, and the self-employed population are expected to contribute voluntarily to the social insurance funds.

However, with the exception of one emergency-related provision in section 13.5.1 of the Social Security Act, which states that "households left homeless as a result of sudden disaster, accident or other unforeseeable reasons, whose house (ger) can no longer be inhabited and who have lost their livelihood", there is currently little to no shock-responsive component in the national social protection system. That is, the provision of monetary assistance in the amount of 1.5 million tugriks to rebuild the family's house (ger) when it was destroyed by sudden events such as floods, fires, and dust storms.

The Disaster Protection Law governs responses to covariate shocks, especially to dzud response. In July of each year, the Government issues a resolution to ensure winter preparedness in all sectors and gives specific instructions to the relevant ministries, aimags, and administrative units (soums) to create an emergency stock of hay and animal feed.

1.3 The UN joint programme on social protection to herders

The SDG-Fund Joint Programme on Social Protection in Mongolia implemented by FAO, ILO, UNFPA, and UNICEF in close collaboration with the Government of Mongolia (GoM) aims to extend social protection to herders and to strengthen institutional capacity to mainstream shock-responsiveness into the national social protection system. Under the UNJP, the Child Money Programme (CMP) implementation system was tested through a pilot programme in response to climate-driven shocks, and Resilience Index Measurement and Analysis (RIMA-II) is being introduced as part of efforts to mainstream the shock-responsiveness into the national social protection system.

More specifically, the work to mainstream shock-responsiveness into the national social protection system under the UNJP built on the feasibility assessment conducted prior to the onset of the Covid-19 global pandemic, which focused on climate-driven shocks (e.g. dzud, droughts), to which Mongolia has become increasingly vulnerable due to climate change. The assessment concluded that the existing governments' mechanism for child benefit is the most suitable system to reach children in the most effective way during shocks.

1.4 RIMA and resilience analysis

Resilience is, nowadays, one of the key words in the policy debate on development economics. Resilience is highly context-specific, not observable in nature and highly time-dependent. It can be applied to various systems (households; community; nations) and sciences (ecological, economic, and architectural) and changes characteristics and effects based on the nature and extent of shocks, therefore it is important to consider the "dynamics" of resilience (Marco d'Errico, 2017)

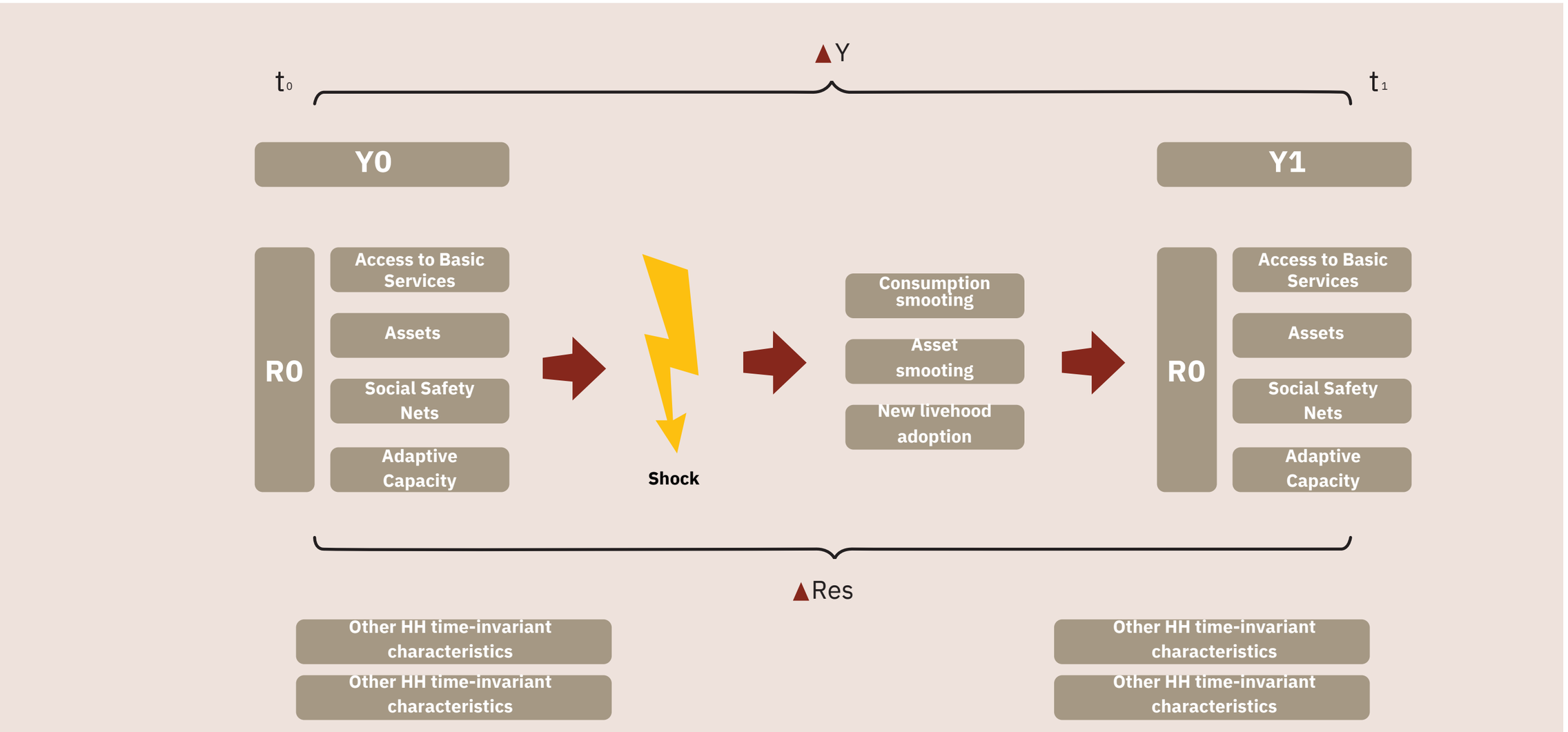
When a shock occurs, households are the central decision-making units (consumption smoothing, asset selling, livelihood strategies choice, coping strategies adoption) and the node of interactions with institutions as well as with both formal and informal social networks (Alinovi et al., 2010). Therefore, the household is the entry point for economic resilience analysis. A household is observed within the interaction framework where it lives, and therefore the relationship between the household and the broader food system it belongs to is important and contributes to household performance in terms of food security (Alinovi et al., 2010).

Measuring households' resilience and the determinants of such resilience, or "resilience capacities," has become an urgent task as households across the globe face an increasingly challenging set of shocks, including climate, economic and geopolitical shocks. Although measuring resilience is challenging because it is multidimensional and cannot be observed or quantified directly, UNFAO and Technical Assistance to NGOs, International (TANGO) have gained extensive experience providing measurement support to resilience-strengthening programmes implemented in developing countries.

Since 2008, FAO, together with other key partners, has been measuring and analysing resilience with respect to food insecurity through the Resilience Index Measurement and Analysis (RIMA) model which bases on household-level data. Although other techniques for measuring resilience in development economics exist, many recent published studies have relied on the RIMA approach using annual panel data. The first version of RIMA has been technically improved, based on its application in ten countries. The renovated methodology, called RIMA-II, was released in early 2016.

RIMA-II directly measures resilience through the Resilience Capacity Index (RCI) and the Resilience Structure Matrix (RSM): the first estimates the capacity of households to cope with shocks and stressors and avoid long-term damages, while the second explains how much each pillar contributes in determining the resilience capacity.

Figure 1. represents the conceptual framework employed as a basis for the estimation of RIMA-II[1].



Gathering large volumes of household-level data requires time- and resource-consuming, and it is not always feasible in countries affected by fragility and conflict. Therefore, to address the complexity, a short RIMA questionnaire was developed and updated in December 2020 which allows to collect the minimum information needed for estimating the household resilience capacity through short interviews.

The objectives of the short RIMA questionnaire are:

- Reducing the time for collecting household data for resilience analysis
- Facilitating the calculation of the RIMA-Resilience Capacity Index using the Excel tool in order to provide timely policy and programming implications
- Reaching households living in areas with limited access to field activities (mobile interviews)
- Collecting high-frequency data – for monitoring interventions or critical contextual factors
- Reducing the time for conducting resilience analysis (reduced data cleaning/data preparation)
- Providing a benchmark to assess whether already existing monitoring and evaluation frameworks are suitable for resilience analysis.

[1] Source: The Resilience Measurement Technical Working Group (RM-TWG) was formed in 2013 as an initiative under the Food Security Information Network (FSIN).

The Short RIMA questionnaire includes different modules, five of which are essential for the construction of the resilience capacity index, which comprises four pillars and Food Security indicators.

PILLARS OF RESILIENCE	DEFINITION
Adaptive Capacity (AC)	Adaptive Capacity is the ability of a household to adapt to a new situation and develop new livelihood strategies.
Social Safety Nets (SSN)	The Social Safety Nets pillar measures the ability of households to access help from relatives and friends, from government, and timely and reliable assistance provided by international agencies, charities, and NGOs.
Assets (AST)	Assets comprise both productive and non-productive assets. Productive assets are the key elements of a livelihood, enabling households to produce consumable or tradable goods. Examples of indicators include land, livestock, and durables. Context-specific sets of productive assets which are able to determine the creation of the household income are evaluated. Other tangible non-productive assets such as houses, vehicles, and household amenities reflect the living standards and wealth of a household.
Access to Basic Services (ABS)	Access to Basic Services shows the ability of a household to meet basic needs

The other modules, such as Shocks and Household demographic characteristics, include variables used in the RCI post-estimation for ranking households and analysing the impact of shocks on the RCI itself.

One of the main reasons for proposing the RIMA-II tool within the framework of the UNJP was to improve the targeting mechanism for the dzud emergency response. For the essence of the concept, the following examples of using RIMA lay down:

Evidence for programming and targeting:

- Resilience and food security analyses conducted at country level (e.g. Country Offices and National Statistical Offices) and supported by FAO (South Sudan, Somalia, Uganda, Nigeria, etc). Or entirely done at country level with minimum technical support from HQ (Guatemala, Senegal, Zimbabwe, etc.)

- Identifies populations for interventions; disaggregates populations for more effective targeting (by livelihoods, gender, region, etc.)

Impact assessments:

- Enhancing-resilience strategies/initiatives (FAO/WFP/UNICEF JRS in Dolow (Somalia), 2012, FAO/WFP/UNICEF JRS in Karamoja (Uganda), 2016, FAO/UN Women/WFP JAP in Bornostate (Nigeria), 2018, RBAs Resilience Initiative in DRC, Niger and Somalia, 2017).

- Project or country investments (Under the GNAFC Programme, the Pro-Resilience Action (Pro-Act) funding mechanisms supports initiatives responding to sustainable solutions to food crises in Myanmar, Palestine, Yemen, etc.

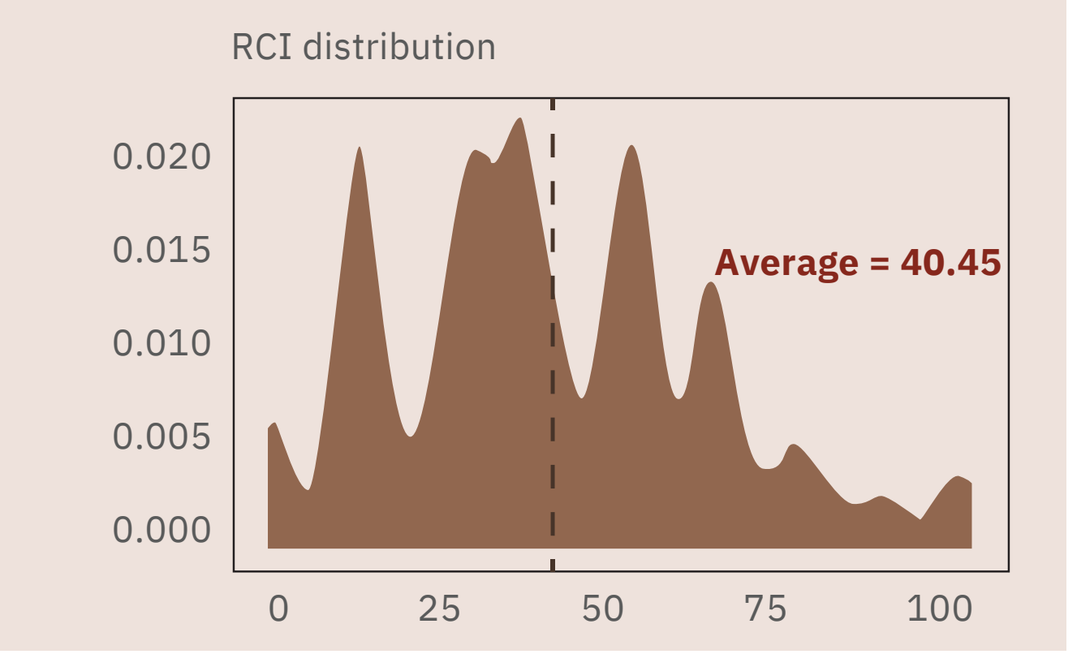
- Social protection programmes (Lesotho's Child Grant Programme, 2011).

The list of 41 questions used in the short RIMA questionnaire is based on experience implementing the full RIMA which isolated the critical variables and questions, literature review (Reference list by questions), and technical consultations among RIMA experts. In addition to the short RIMA questionnaire that can be contextualized to a specific context, the RIMA experts also have already made available data cleaning instructions and the Shiny RIMA tool for resilience measurements and assessments.

2 MAIN FINDINGS, POLICY AND PROGRAMMING IMPLICATIONS

MAIN FINDINGS, POLICY AND PROGRAMMING IMPLICATIONS

2.1 Resilience capacity index of herder households



Using information collected from more than 10000 herder households across 330 administrative districts of 21 provinces and peri-capital 6 districts in Mongolia, the average resilience level is calculated as 40.45 with 57% of the population having below-average capacities. Only 10% of the population is highly resilient with the Resilience Capacity Index (RCI) above 70, while there are more than 20% of the households are struggling with scores lower than 20. The least resilient herder households often have limited assets, education, and ability to access basic services, which can leads to inadequate winter preparation. This exposes them to the risk of losing livestock in a single event shock that could push these families further into poverty.

The Resilience Structure Matrix (RSM) shows that Asset (AST) pillar has the highest influence on the RCI, followed by the Access to Basic Services (ABS), the Social Safety Net (SSN), and the Adaptive Capacity (AC) pillars. This means that asset is the most important component in building the resilience of herder households. Within the scope of this project, household assets can be described by three aspects: availability of agricultural tools (e.g., sickle, tractor, warm shelter for animals), possession of non-productive durables (such as Truck, Motorbike, Ger, Television), and the number of livestock owned.

Among these three, agricultural tools and non-productive durables show stronger correlations with the pillar than the number of livestock owned per capita (see the second plot in Annex IV). The result suggests that, despite the importance of livestock ownership to herders, their long-term resilience will depend more on the availability of agricultural tools and equipment that help increase productivity and facilitate efficient use of available natural resources. Especially as Mongolia's ecosystem is facing overstocking, overgrazing, rangeland degradation, and the strong adverse impact of climate change.

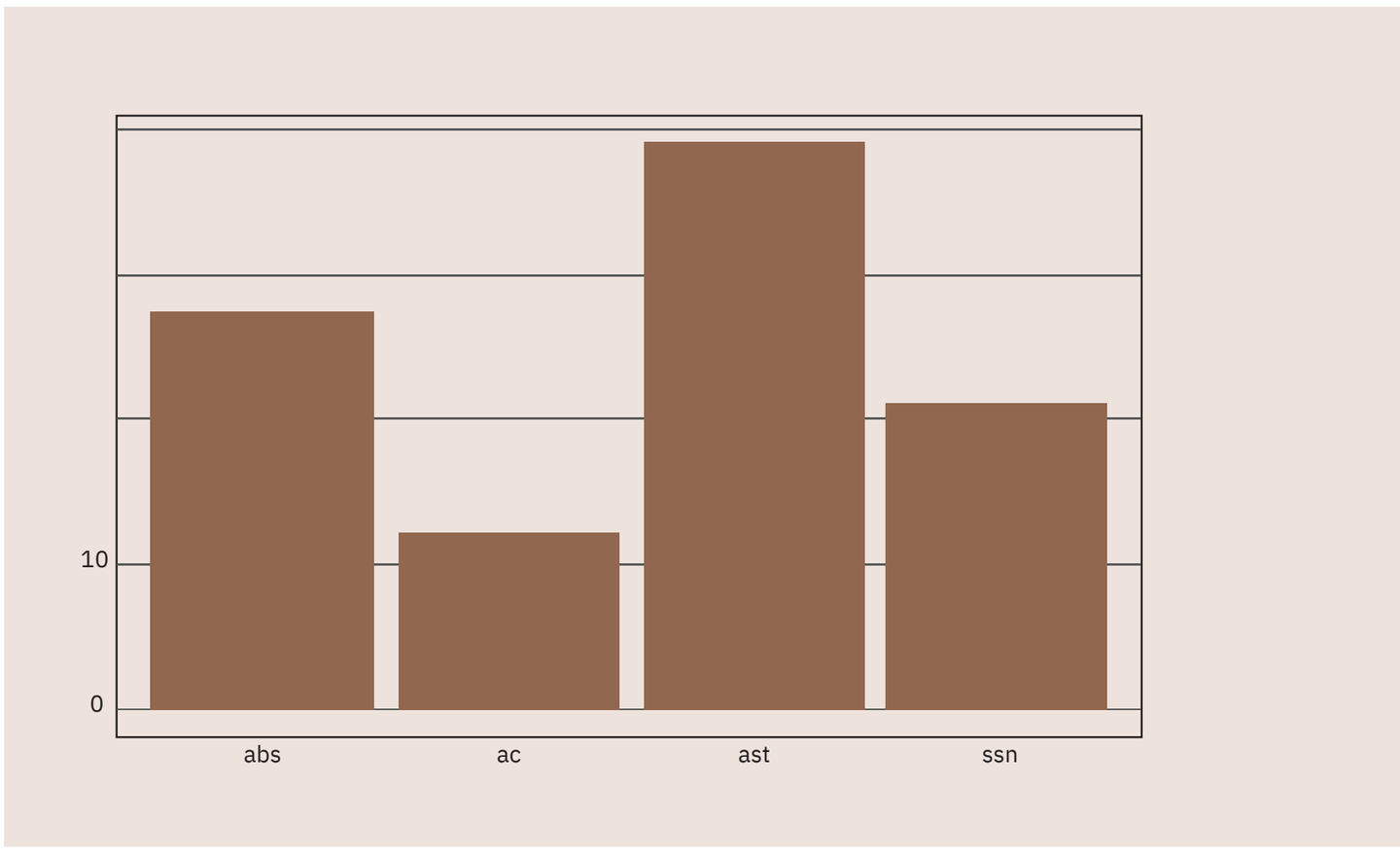


Figure 2 shows the overall Resil- ience Structure Matrix with the influence of pillars on household resilience.

Next, accessibility to basic services also plays an important role in building the resilience of rural households. In particular, having access to electricity is a key part to eradicate poverty and promote prosperity. Affordable, reliable, and sustainable energy not only allows herders to diversify their activities and sources of income, but also impacts their living conditions, education, and health. Efforts to bring electricity to rural households will need to be accelerated, as of the population surveyed, only 14% said grid connection is available. Besides, enhancing road connectivity and infrastructure quality can significantly improve economic development and the resilience of

herding communities. Herders often live far from settlements, making it challenging and costly to approach basic service facilities (e.g., schools, hospitals, banks, markets). Once a disaster occurs, it is important that they can be contacted and receive assistance in a timely manner.

Some other factors that can affect the ability of herder households in coping with shocks and stressors are:

Limited income diversification

Although livestock for herder households is the main source of income due to a limited market and processing industry, herders' income is narrowed to the sale of cashmere and meat slaughtered or sold alive for slaughter. These 2 types of sales bring seasonal cash flow, that is, from cashmere in the spring, and from the sale of livestock and meat in the fall when the animals are fattened up enough. For most households, due to their eligibility for social welfare programmes (such as the Universal Child Money Programme, Old Age Pension, Disability Benefit, Maternity and Child Care Benefit, Survivor’s Allowance, The Special Care Allowance, and Food Voucher Programme), the formal transfer is the second source of income to cover monthly household expenses, excluding livestock-sourced food. Here, it should be noted that as 2021 was a challenging year with combined risks of COVID-19 and dzud, the Government of Mongolia has issued a one-time cash transfer of MNT 300,000 to each citizen of the country and MNT 1000,000 to each of the 181,051 herder households. In addition the amount of all social benefits were increased.

Limited variety of food

Mongolian cuisine predominantly consists of dairy products, meat, and animal fats, particularly in herder households with abundant animal protein and fat available in the year-round affordable diet. In addition, starchy flour and rice are consumed commonly in daily meals, and the traditional unbalanced diets are further exacerbated by increased imports and consumption of juices and sweetened beverages. The impact of these unbalanced food choices was reflected in issues of obesity, which are a dominant and growing problem for children as well as for adults. Obesity reached 48.8–62.7 percent among adults, while it increased almost sevenfold among children aged 6–11 years. The situation is worsened by the increasing prevalence of micro-nutrient deficiencies, specifically iron and vitamin D. Over the years, there has also been an increase in the prevalence of non-communicable diseases (NCDs), with 27.5 percent of the population suffering from hypertension, about five percent from diabetes and nearly 17 percent at the risk of stroke. Health statistics show high morbidity and mortality rate from NCDs, such as hypertension, diabetes, and cancer in Mongolia. Stomach cancer, liver diseases, and stroke are among the leading causes of death. Research from National Statistics Office (NSO) Mongolia found lasting negative impacts of cyclical climate-driven shocks on children's education and health. These studies found that due to income constraints faced by herder households affected by the shock, pre-primary and primary (aged 6 to 10) school aged children were less likely to be enrolled in school 2 to 3 years after the shock (while the same was not true for older children), and were significantly less likely to complete basic education. Negative impacts on herder children's height were also observable 3 years after the shock (Valeria Groppo & Kati Kraehnert, 2015). Herder households have the opportunity to increase the diversity of their unbalanced traditional diet by growing potatoes and vegetables on the small plots available in their winter camp, but due to the limited or almost non-existent training system and extension services in rural areas, their knowledge and opportunities are limited.

Low participation in local herder group/association

Eighty percent of the surveyed households are not members of any local herder cooperatives and existing cooperatives are not set up to provide support to their members in case of need.

Low attendance in training

The least educated and lower skilled members of a society are likely to be the most vulnerable to climate hazards in terms of livelihoods and geographical location (Brenda, 2011). Only 4.6 percent of the surveyed households received some kind of livestock farming technological training in the last 12 months, which is a highly unsatisfactory result.

Low coverage for the Index Based Livestock Insurance (IBLI).

Only 22 percent of the surveyed households paid for the insurance. IBLIP, based on a credit-agreement with the World Bank, was first launched in the country in 2006 as a result of government efforts to find possible solutions to protect herders from climate change-related livestock mortality following the devastating 1999-2002 dzud that killed 30 percent of the national herd. This unique insurance scheme combined self-insurance, market-based insurance and social insurance. Incorporating “risk-layering”, herders bear the cost of small losses of adult animals (less than 6% livestock mortality rate in the soum) that do not affect the viability of their business; larger losses are borne by the private insurance company and the final layer of catastrophic loss are borne by the Government, was the world's first such type of insurance. The idea behind the scheme is that efficient herders will benefit through mitigating their loss as against inefficient herders. For an over-simplified example, supposing the area wide mortality is 30%: then the pay out to all herders would be set at that level. An efficient herder might only suffer an actual loss of say 25%, but would still receive the 30% pay out. On the other hand, an inefficient herder might suffer an actual loss of 35%, and still only receive a 30% pay out. According the World Bank, IBLI project with over US$10 million (not including the CDF) of implementation cost from 2006 to 2010, helped to protect thousands of herders from catastrophic losses that resulted from the impacts of extreme weather events and prevented thousands of herders from falling into abject poverty. A hundred percent of qualified herders have received payments from the private insurers after suffering devastating losses from dzuds in 2009 to 2010. Five insurance companies participated in IBLI and almost 10% of herders have purchased policies. After devastating losses in the dzuds from 2008, about US$340,000 (MNT 389 million) was paid to 1,783 herders – only a small amount of which came from the government coverage. About 19,500 herders purchased the insurance during the 2013-2014 cycle, an increase of 21% over the past cycle. All herders eligible for compensation got indemnity payments. The Index-based Livestock Insurance Law passed by an Act of the Parliament on June 2014, as the legislative regulation of relations related to the index-based livestock insurance activities, the mechanism of state control, the distribution of risks, the payment of insurance compensation, and the protection of the interests of reinsurers and insurers. Since with the act the legal basis for the establishment of the Agriculture Reinsurance Joint Stock Company, the Company was duly established, registered and issued a certificate under the Company’s Act on September 26, 2014. The Government has also released an amount of 20 billion on MNT as the initial capital for the Company out of which 19.6 billion MNT were invested by Government bonds leaving 0.4 billion MNT in the Company’s accounts. However, in recent years, herders' access to the IBLI has tended to decline. This is due to the fact that almost 85 percent of herder households have bank loans, with limited income due to constantly declining prices for livestock and livestock products, they have to repay loans rather than buy insurance appropriately.

Low education level

Mongolia has a high literacy rate of 98%, but in the first 10 years of social transition since 1990, children in rural areas have dropped out of school, which is at a certain level among the current working age population. The average year of education in adult is 8 and 4.8 percent of the heads of surveyed households are illiterate. Number of years of education has often been used as a

proxy indicator of knowledge and skill, and exists as a key indicator in the United Nations Human Development Index (Abdulai and Eberlin, 2001). The least educated and lower skilled members of a society are likely to be the most vulnerable to climate hazards in terms of livelihoods and geographical location. It is important also to mention farmer knowledge in adopting new strategies to cope better with climatic shocks. Indigenous knowledge and experience of the environment is, in many cases, at least as useful as having a high level of literacy.

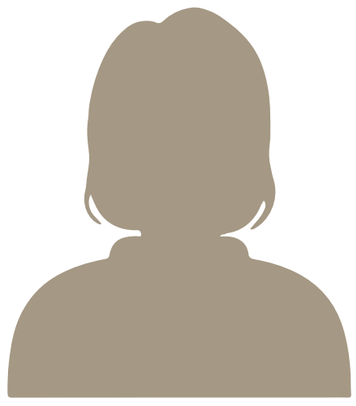
Inadequate wither preparation

The limiting factors of insufficient hay and fodder for the herd that can be survived the lean season are natural and climatic conditions (drought), lack of resources (overgrazing, rangeland degradation, availability of hay-making fields), household capital (human income, tools, and machinery/equipment for haymaking). The inadequate wither preparation leads to losing their livelihood assets. To ensure the survival of livestock, herder households have to buy expensive hay and fodder from the market or migrate to remote areas with access to pastures. However, the purchase of animal feed is limited for herder households, who are low-income and do not have sufficient collateral to obtain a bank loan. In particular, for vulnerable households with young children, people with disabilities, and the elderly, both coping strategies are limited and they have to rely on the support of the state and humanitarian organizations.

RESILIENCE BY GENDER OF HOUSEHOLD HEAD

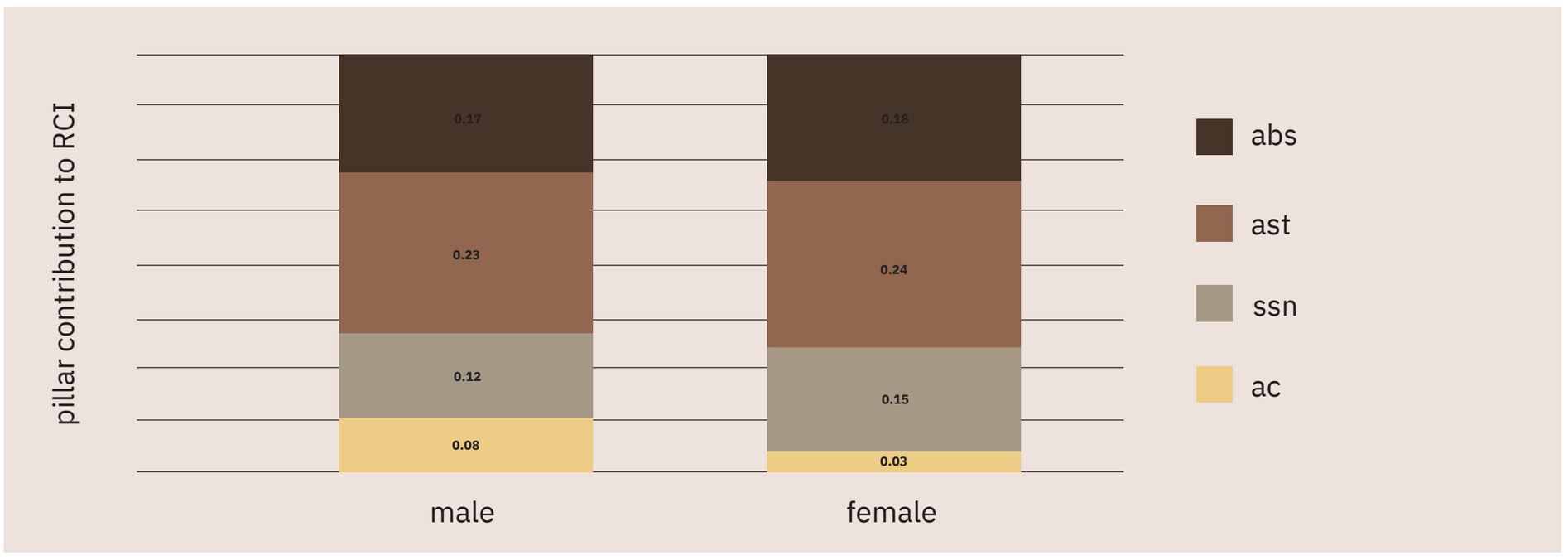
Evidence suggests that male-headed households are more resilient than and female-headed house- holds, with average RCIs of 40.72 and 37.58, respectively. This gap can be explained by the greater reliance of female-headed households on assets and supports received, as suggested by the Resilience Structure Matrix (RSM). Overall, female-headed households have better access to basic services, howev- er they have significantly less agricultural tools, non-productive durables, numbers of livestock as well as sources of income compared to male-headed households. They also face more difficulties in getting loans or finding family supports if needed, and have lower levels of education.

RCI
40.72



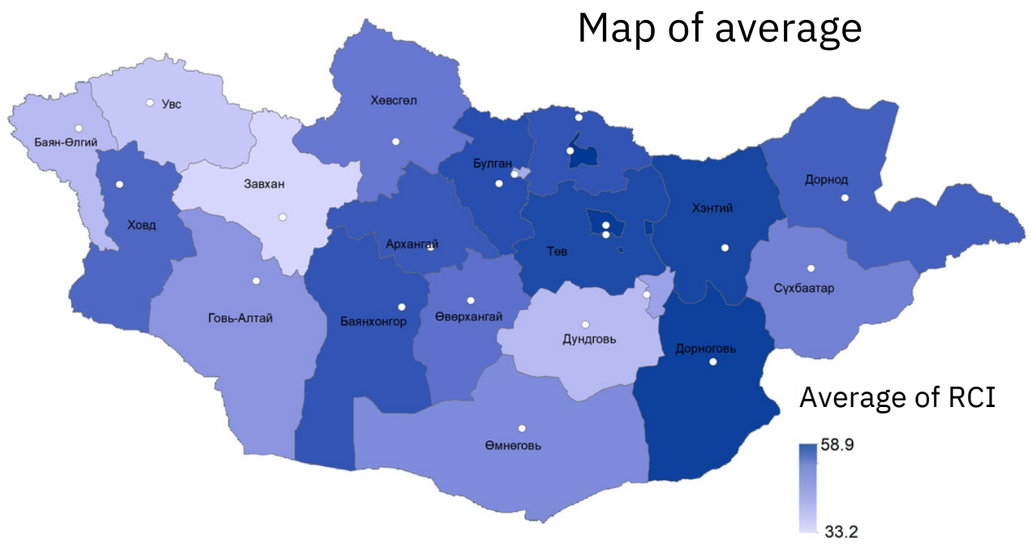
RCI
37.58

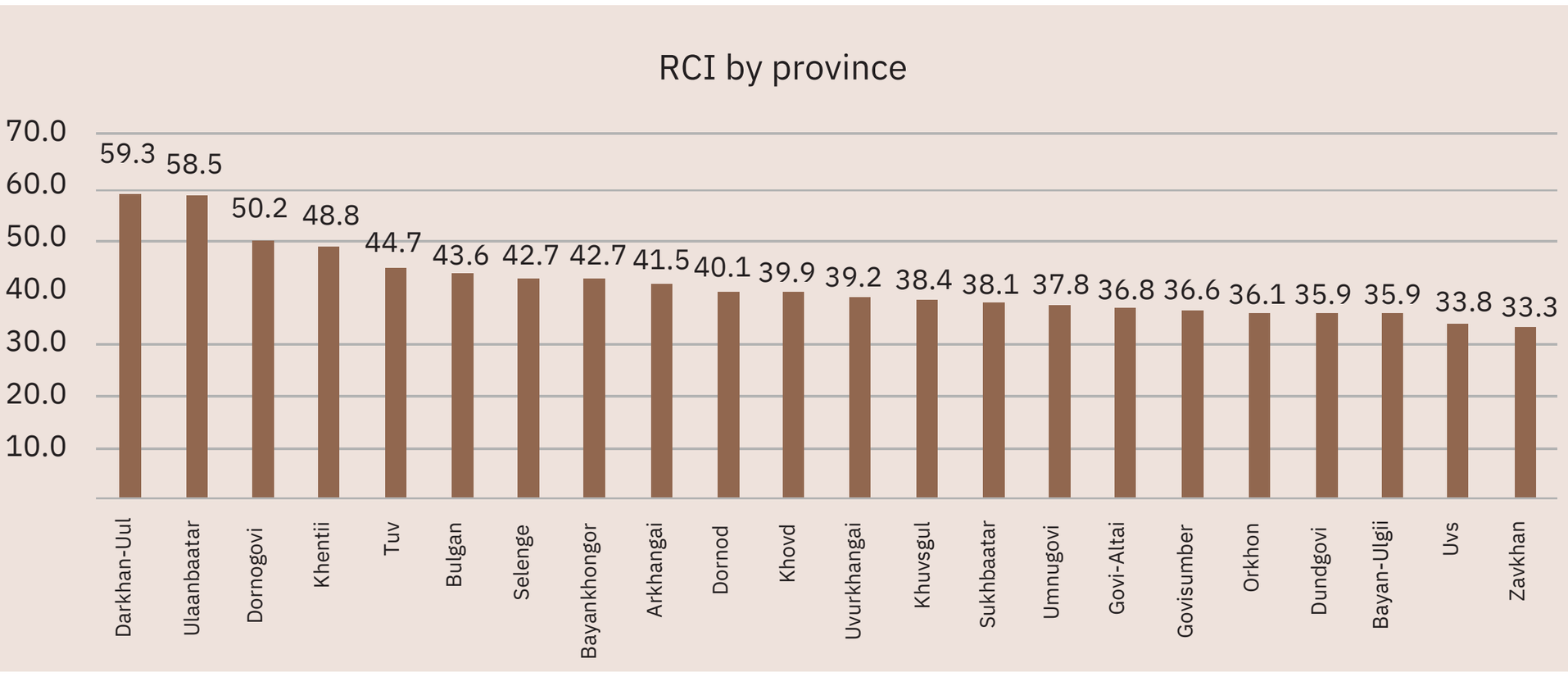
Figure 3 shows the Resilience Structure Matrix by gender of household head.



2.2 Regional heterogeneity

Herders households in different regions are not equally resistant to shocks and stressors. Within the survey sample, Darkhan-Uul and Ulaanbaatar are two aimags with the highest average RCIs of 59.3 and 58.5, respectively. Meanwhile, the least resilient aimags are Uvs and Zavkhan, with average RCIs of 33.8 and 33.3, respectively

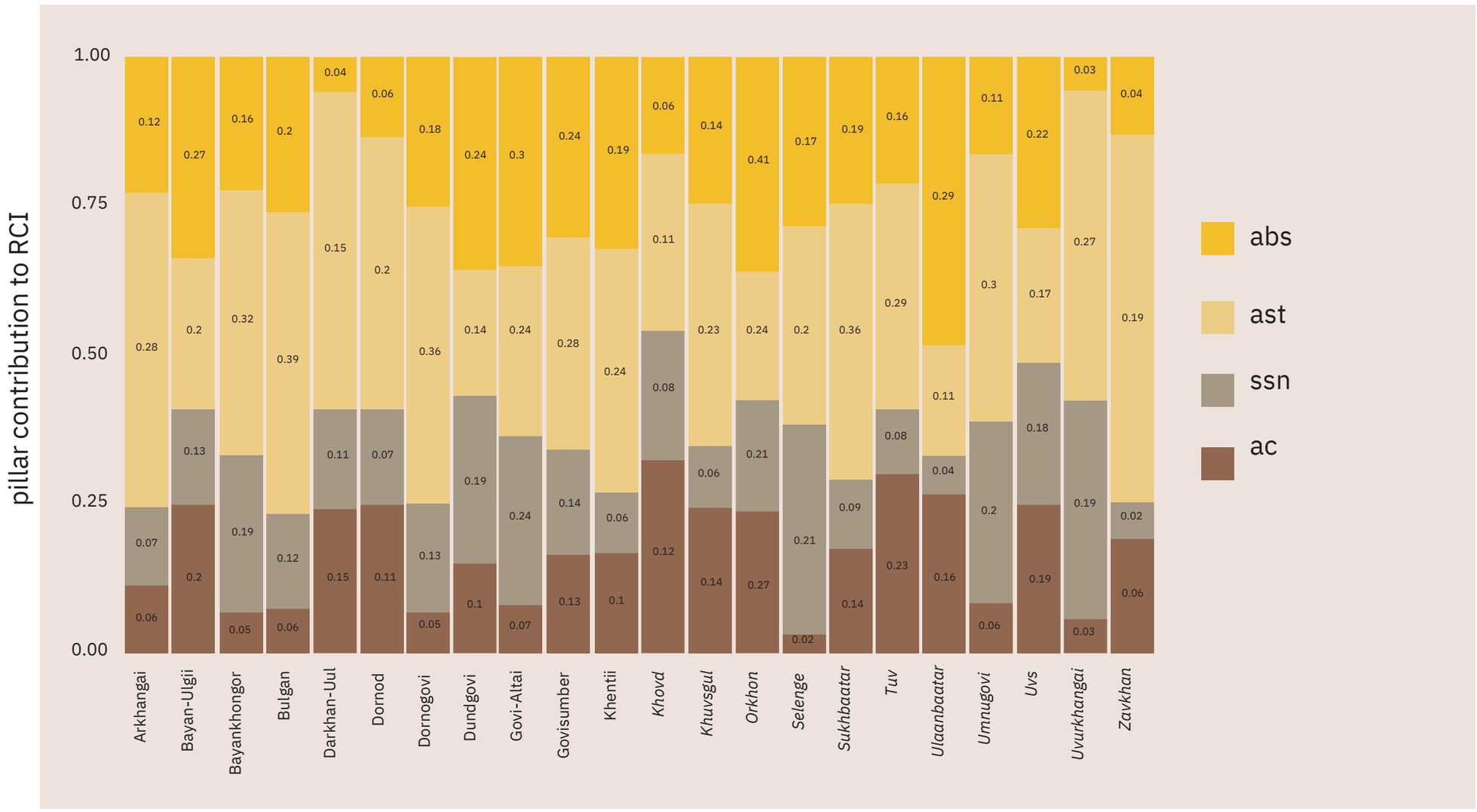




The fundamental difference here is the access to basic services and the ability to consume different types of foods to ensure nutrients. Data on dzud conditions reported by the National Meteorological Service also tell part of the story. Due to the remoteness and poor infrastructure development in the Zavkhan and Uvs provinces, herder households here suffer from the lack of access to basic services and the increased frequency of natural disasters, leading to higher levels of vulnerability. They also have limited access to a variety of food: responses from almost 70 percent of surveyed households in Uvs and Zavkhan aimags indicate that only 2-4 types of food (flour, rice, meat and dairy products) were in their diet of the past 7 days. This may be linked to poor diets that are high in sugar, sodium, and unhealthful fats that result in negative health outcomes.

Meanwhile, households Darkhan-Uul and in Ulaanbaatar aimags enjoy more developed infrastructures and better access to basic services. They can also consume more food groups and better prepare hay/ fodder to meet the next grass season, thus when a disaster happened, they can withstand and bounce back from the tragedy. The RSM below shows the contribution of each pillar to the resilience of each province. In Darkhan-Uul aimag, which has the highest RCI, assets play a greater impact on households' resilience, while in Ulaanbaatar access to basic services is more influential.

Figure 4 shows the Resilience Structure Matrix by province.



Household resilience also varies in zones with different degrees of urbanization. Overall, peri-urban households are more resilient than remote rural households, with average RCIs of 54.81 compared to 39.77. The higher RCI for households in Tuv, Selenge and Khentii can be explained by their closeness with an improved infrastructure (road, power supply, and market) due to location near by Ulaanbaatar and Darkhan cities. Dornogovi province, compared with other provinces, has good infrastructure such as railways, paved roads and electricity, and is adjacent to the border with China, so the price of consumer goods is cheap, and the price of livestock and livestock products is higher due to the good export opportunity.

Table 1 shows the average household resilience in different zones and per province within these zones.

Zone/ Province	Average of RCI
Peri-urban	54.81
Darkhan-Uul	59.31
Orkhon	36.11
Tuv	52.50
Ulaanbaatar	58.54
Rural	39.77
Arkhangai	41.54
Bayankhongor	42.65
Bayan-Ulgii	35.86
Bulgan	43.64
Dornod	40.08
Dornogovi	50.15
Dundgovi	35.87
Govi-Altai	36.83
Govisumber	36.65
Khentii	48.79
Khovd	39.95
Khuvsgul	38.39
Selenge	42.74
Sukhbaatar	38.10
Tuv	43.71
Umnugovi	37.78
Uvs	33.81
Uvurkhangai	39.23
Zavkhan	33.34
Total	**40.45**

2.3 Shocks and coping strategies

Shocks:

The Covid-19 pandemic (75.6%), followed by a drought/dzud (48.0 %), were the most common shocks affecting the livelihoods of surveyed households in the past 12 months. The next major disturbance (37.2%) was the price fluctuation of livestock products, hay and fodder caused by these two shocks. In particular, hyperinflation in prices of hay and fodder has had adverse impact on the resilience of herder households.

Among the shocks considered, Dzud has a significant negative impact on the resilience of herder households (see Annex IV). Besides, statistics indicate a positive relation between Covid and resilience, however, this can be explained by the increase in support households received from governments, relatives, and associations in order to overcome the effect of this pandemic.

Coping strategies:

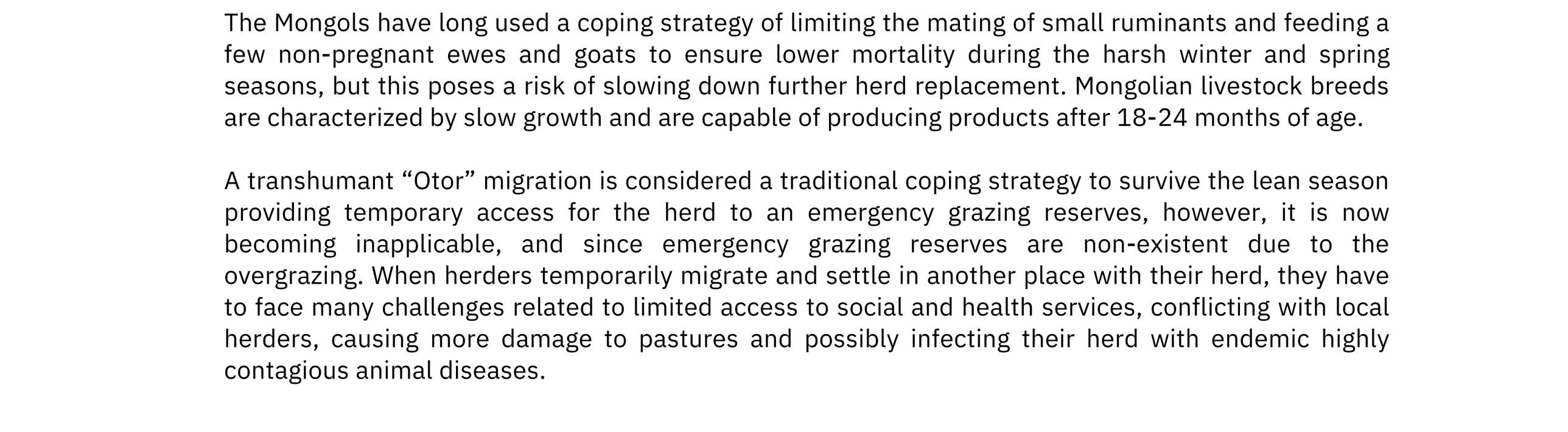
To mitigate the adverse impact of dzud, 45% of the surveyed households responded that they obtained a bank loan to buy hay and fodder, 34% sold some of the livestock to organize funds to buy hay and fodder for the remaining herd, 17.7% had to limit reproduction of small ruminants, and 16.6% had to temporary migrate with the herd to other regions in search of access to pastures.

It can be concluded that the applied coping strategies are only temporary fire extinguishing, and not transformative to support the ability bounce back to the previous level of well-being.

Although access to loans can give households initial supports to recover after the disaster, the existing loans of commercial banks in Mongolia at high interest rates (18-24% per annum) and short-term (maximum 24 months) create difficulties to repay the loan by herder households with seasonal income. As natural and climate hazards, drought and dzud have become more frequent and almost become annual events with increasing damage, it is already clear that households that received a loan this year will not be able to access new credit if shocks and natural occur in a consecutive years.

The Mongols have long used a coping strategy of limiting the mating of small ruminants and feeding a few non-pregnant ewes and goats to ensure lower mortality during the harsh winter and spring seasons, but this poses a risk of slowing down further herd replacement. Mongolian livestock breeds are characterized by slow growth and are capable of producing products after 18-24 months of age.

A transhumant “Otor” migration is considered a traditional coping strategy to survive the lean season providing temporary access for the herd to an emergency grazing reserves, however, it is now becoming inapplicable, and since emergency grazing reserves are non-existent due to the overgrazing. When herders temporarily migrate and settle in another place with their herd, they have to face many challenges related to limited access to social and health services, conflicting with local herders, causing more damage to pastures and possibly infecting their herd with endemic highly contagious animal diseases.



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2.4 Policy recommendations

Create favourable legal environment:

- Create a risk-informed (dzud preceded by drought) shock-responsive social protection programme for vulnerable herder households, particularly the herder households with the least RCI (below 25); Ex ante social protection transfers may protect the households from poverty and strengthen their resilience. Clear financing arrangements to support the deployment of emergency social protection responses and the use of reserve and contingency funds by the Ministry of Labour and Social Protection are necessary, with a consideration that member organizations of the humanitarian country team (HCT) have already used available funding sources for dzud response and further funding through humanitarian actors in particular, for anticipatory action, is limited.

- The integrated and operational household database should be strengthened, as it is an ideal system for identifying beneficiaries both in the case of a shock and potentially before a shock, for transfers that support household preparedness.

- Establish a flexible credit system specifically designed for herder households to reduce impact of disaster risks.

- To foster a legal framework for the creation of community contingency funds that will be maintained and not transformed into a savings & credit unions/coops.

- It is necessary to make necessary changes in the livestock indexed insurance system, especially in the threshold parameters, in accordance with the features of the areas that are highly affected by desertification and the risk of drought and dzud is more frequent.

Increase income diversification:

- Diversify income from animal husbandry through the creation of local production for the processing of hides and other slaughter products, while creating jobs in rural areas.

- Ensure the provision of the necessary equipment and "green" loans to herders that are interested in improving soil fertility by processing manure into bio composts and fertilizers. This could be complemented by providing technical training.

- To support the cultivation of vegetables for herder households and include them in vegetable producers subsidy system. On the other hand, this will have an important impact on increasing the food diversification of herder households.

Livestock intensification:

- Promote livestock intensification (but not industrialization) with improved technologies for modernization. This could be complemented by supporting input providers and extension services which could promote improved use of farming tools and inputs. The main condition for a good economic turnover with small herd is to obtain value from all products that can be harvested from livestock (not only meat, milk, wool, fibre, skin and hide, but also by-products of slaughter and manure). Therefore, appropriate work-facilitating tools and equipment are essential along with appropriate training to increase values of livestock products and raw materials.

- Encourage community hay and fodder cultivation and as well as emergency grazing reserve area management with the support of the necessary machinery.

Promote and invest on agricultural extension and training system:

- Adopt regular herder training, focused particularly on climate smart livestock production techniques.

- This could be complemented by increasing access to credit and providing technical training, which could promote improved use of farming tools and inputs.

Promote low-carbon community resilience initiatives with donor-funded projects and programmes

- Implement system-level research and interventions for climate-resilient and low-emission livestock production systems. Improve local capacities and inclusion in livestock production to support inclusive scaling of resilient low-emission practices.

- Help finance the transition to low-emission and resilient livestock agrifood systems. Improve the enabling policy environment.

3 METHODOLOGY AND COVERAGE

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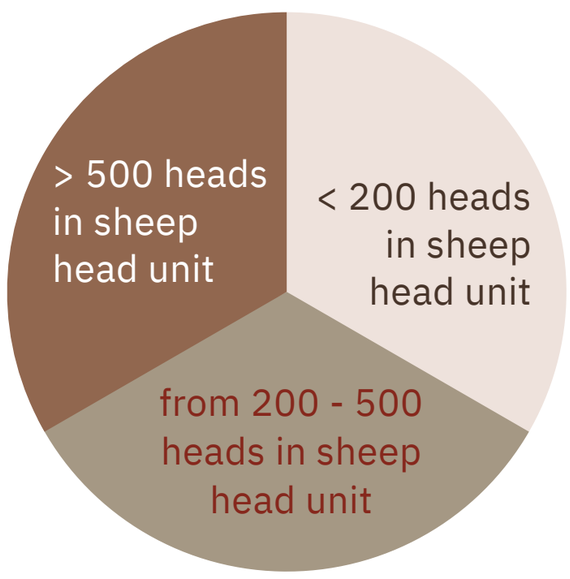
METHODOLOGY AND COVERAGE

3.1 Survey questionnaire

The RIMA is context and shock-specific, therefore the short RIMA questionnaire is structured with possible contextualization to capture characteristics of the implementation context. Taking into account the specifics of Mongolian herder households and shocks, with particular emphasis on dzud, the short RIMA questionnaire was adapted and used (see Appendix 1).

3.2 Sampling design

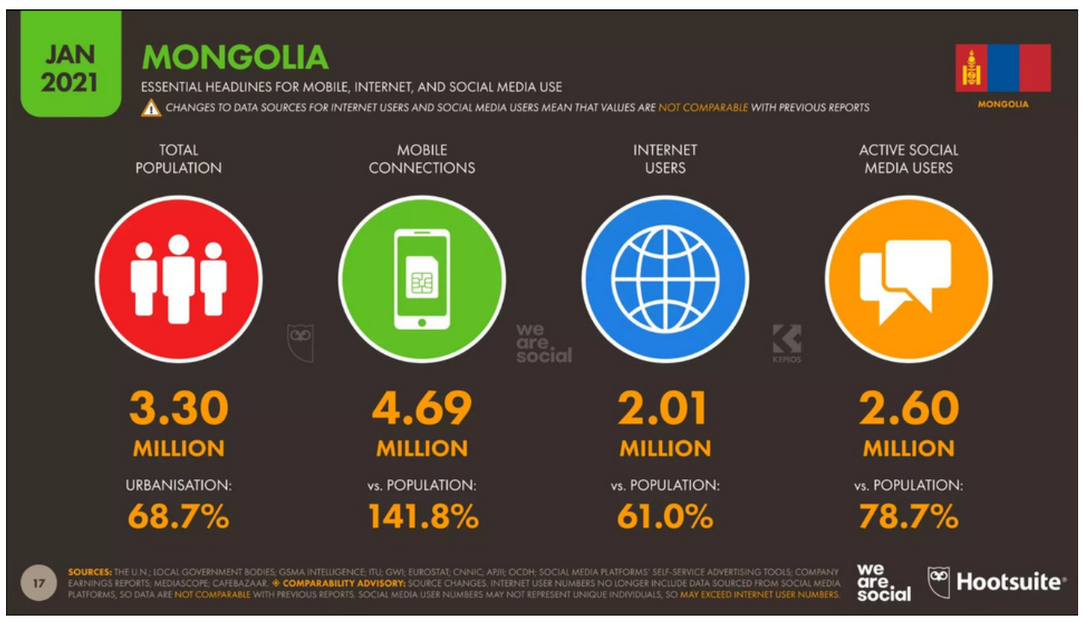


The sampling design was to interview households from areas equally in the following three categories according to the size of herds owned by the households:

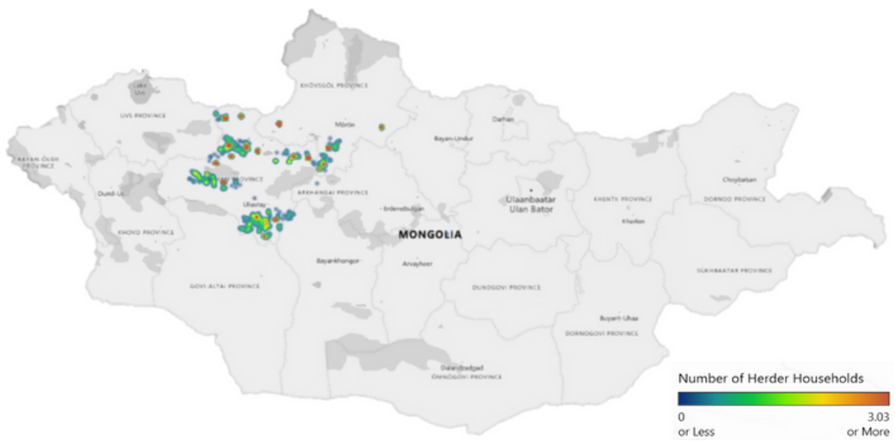
1/3 Households with a herd less than 200 heads in sheep head unit
1/3 Households with medium-sized herd from 200 to 500 heads in sheep head unit
1/3 Households with large herd, with more than 500 heads in sheep head unit

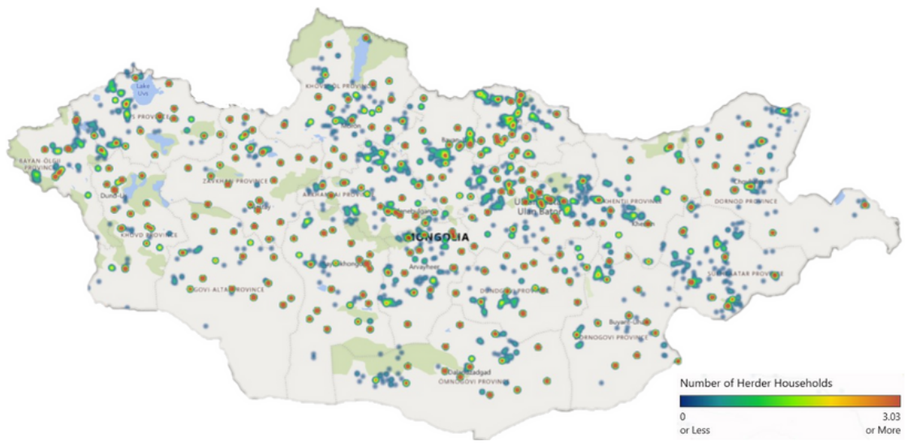
3.3 Data collection

The mobile data collection using Kobo Toolbox was designed, because for Short RIMA data are normally collected through mobile devices using platforms such as KoBo Toolbox or other platforms, including ODK, CS Pro, etc.



The ever-expanding mobile connectivity and digital consumerism in the country have enabled the survey to be conducted efficiently.
Having trained local officers with smart phones (Android) from 23 dzud-affected soums of Zavkhan and Khubsugul aimags on mobile data collection using KoBo Toolbox, the first attempt was conducted in April-May 2020; as a result, data were collected from 2187 herder households from the soums.





Since the pilot project proved the feasibility of conducting a large-scale mobile survey, after the revision of the short RIMA questionnaire led by the FAO RIMA team, contextualizing specifically the Mongolian herder households and livestock production systems, in March and April 2021, data were successfully collected from 10,023 herder households from all 330 soums of 21 provinces and 6 districts of Ulaanbaatar. It should be noted that despite the strict nationwide lockdown imposed due the COVID-19 pandemic, thanks to the support of the head of the State Emergency Commission and the direct involvement of the Department of Disaster Risk Management, NEMA 1072 local government employees, such as subdistrict (bagh) governors, social workers, livestock officers and emergency management officers with Android smartphones and tablets were mobilized and trained in three series of virtual (scalable) household survey training sessions using the KOBO toolkit. As a result, data were successfully collected on 10,023 herder households indicating their geolocation.

Although the collection of large amounts of data at the household level is considered time and resource-consuming, and not always feasible, this data collection has shown that mobile data collection is already possible in Mongolia, even during the pandemic time, in the country where herder households are located far apart.

General population data by the RIMA-2021

Total of interviewed HHs	**10,023**
Total people in HHs	**40,951**
Average size of HHs	**4.1**
Of which: Single parent-headed HHs	**24.69%**
Female-headed HHs out of single parent-headed HHs	**8.63%**
Households with disabled person	**10.62%**
Children at age of 0–18 y.o	**39.7%**
Persons at working age 18–60 y.o	**57.7%**
Number of people who pay social Insurance	**36.4%**
Number of people who pay for health insurance (including children and the elderly)	**36.5%**

3.4 Data cleaning and processing

To obtain the final Resilience Capacity Index (RCI), the data must be cleaned from inaccurate records, inconsistency, misspelled words, improper case, and outliers. After exporting the dataset from Kobo in excel format, it was noticed that the dataset needs to be cleaned up properly. Therefore, ten students from Mongolian University of Life Sciences (MULS) were hired to check numbers in outliers, remove duplicates, fix errors such as typos or inconsistent capitalization, and handle missing values. Out of a total of 10,023 households collected, 9,910 households were improved and made available for further analysis, i.e. non-herder households were excluded.

For the resilience capacity index (RCI) profiling: province, gender of household head and area (rural pastoral and peri-urban) were selected. For peri-urban area interviewed households from peri-urban districts of Ulaanbaatar, Bayanchandmani, Batsumber and Bornuur soums of Tuv aimag as well as households from Darkha-Uul and Orkhon aimags.

For data processing: Since the RIMA team has already developed the R Shiny RIMA package, following RIMA rules, the variables in the Annex I were employed per pillar.

4 NEXT STEPS

NEXT STEPS

Recommendation of the RIMA-II tool in Mongolia

The RIMA tool explains why and how some households cope with shocks and stressors better than others do, moreover, the short RIMA questionnaire, data cleansing and processing tools are already available, and this is one of the resilience-building monitoring tools and framework of UN. Given these conditions, and taking into account the following advantages of Mongolia, it is recommended that RIMA be used primarily to improve targeting mechanisms for Anticipatory action in response to Dzud and further to impact assessments of humanitarian and social protection interventions provided to vulnerable herder households:

- In August of each year, the national meteorological service assesses past summer conditions and estimates the carrying capacity of pastures for the coming winter and spring sampling from 1550 monitoring sites throughout the country

- After the establishment of a stable snow cover from the beginning of December, the risk of dzud is assessed by the meteorological service and plotted on dzud risk map.

- Mongolia is one of the few countries in the world that conducts annual livestock censuses (since 1961), that is through the annual livestock census each herder household is surveyed. The annual livestock census is carried out in the season (first week of December) when the risk of severe winters due to summer drought is already known.

Therefore, it is possible to integrate the RIMA Short Questionnaire with the livestock census, covering each herder household.

When the dzud risk map confirms a high-risk geographic area, it is possible to conduct a rapid assessment using the questionnaire again to determine which households need immediate assistance.

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ANNEX I

Variables employed in the estimation of RCI

Access to basic services (ABS)

Improved water: A dummy variable, taking value one if the family has improved water source (piped dwelling, piped public tap, protected shallow well, borehole, protected spring, roof rain water).

Improved sanitation: A dummy variable, taking value one if the family has improved toilet facility (pit latrine with barn)

Access to electricity: A dummy variable, taking value one if the family has connected to electricity

Distance to main services: Index of closeness to main services (market, schools, health centres, bank etc.)The index has been constructed using factor analysis, and following RIMA rules which hypothesizes that variables inside the pillar need to go in the same direction (positive is good, negative is bad), and inverse measurements of each of the distances have been taken (being close to main service increases household well-being).

Wealth index: Household wealth index or asset index is created through factor analysis. A list of variables assumes a value of 1 or 0 is used, depending on whether or not a household has specific non-productive assets, such as Sedan car, Truck, Motorbike, Solar batteries, Ger, House, Television (TV), Mobile phone

Agricultural Asset Index: An aggregate index build using factor analysis; variables used are all the types of agricultural inputs owned by the households (Sickle, Dump rake, Tractor Hay rake, Warm shelter for animals)

Large Livestock Units (LLU) per capita: Large livestock unit (Бодод шилжүүлэх коффициент) standardizes different types of livestock into a single unit of measurement. LLU is used for Mongolian livestock production system to estimate efficiency of production. The conversion factor adopted is: 1 horse, 1.5 camel; 1 cattle; 0.17 sheep; 0.125 goat; offspring: 0.23 foal; 0.3 baby camel; 0.23 calf; 0.03 lamb and 0.02 kid.

Social Safety Nets (SSN)

Formal cash transfers: A dummy variable, indicating that the household members has received any formal cash transfer in the last 12 months.

Participation in associations: Number of the associations can provide support in case of need.

Family support: Number of relatives/friends/family members who can provide support the household in case of need.

Livestock Insurance: A dummy variable, indicating that the household insure the household owned herd with index-based livestock insurance.

Adaptive capacity (AC)

Year of average education: Number of years of formal education

Hay and fodder sufficiency: A dummy variable, taking value one if the household prepared to hay andfodder sufficiently to meet the next grass season

Income diversification: Sum of the different sources of income for the household.

Attended training: A dummy variable, taking value one if the household member attended training in the last has months.

Food security (FS)

Food consumption score: A score calculated using the frequency of consumption of different food groups consumed by a household during the 7 days before the survey. There are standard weights for each of the food groups that comprise the food consumption score.

Household dietary diversification score: The number of unique foods (or food groups) consumed by household members based on the past seven days recall.

ANNEX II

SHORT QUESTIONNAIRE FOR RESILIENCE INDEX MEASUREMENT AND ANALYSIS (MODIFIED TO MONGOLIAN CONTEXT)

Access to basic services (ABS)

1.Is the main source of drinking water for members of the household piped a household water connection, public taps or standpipes, tube wells, boreholes, protected dug wells, protected springs or fresh snow or ice collected from river collection?	[1=yes 0=no]
2. Is the main type of toilet facility used by members of the household a pit latrine with barn?	[1=yes 0=no]
3. Is electricity the main source of energy used in the household for cooking or lighting?	[1=yes 0=no]
4. How far (one way) is the household dwelling from the closest accessible/ functioning [SERVICE] in kilometres?	[Kilometers]
• Secondary school	
• Kindergarten	
• Public hospital / health facility	
• Nearby market (food)	
• Public means of transport	
• Veterinary service	

Assets (AST)

5. How many [DURABLES/ASSETS] do the members of the household own?	[number]
• Car	
• Truck	
• Motorbike	
• Sickle	
• Dump rake	
• Tractor	
• Hay rake	
• Warm shelter for animals	
• Solar batteries	
• Ger	
• House	
• Television (TV)	
• Mobile phone	
6. How many [LIVESTOCK] does the household currently own?	[number]
• Horse	
• Camel	
• Cattle/Yak	
• Sheep	
• Goat	
7. How many new-born animals does the household members have or expect to get during the current birth season?	[number]
• Foal	
• Camel calf	
• Calf	
• Lamb	
• Goat kids	

Social Safety Nets (SSN)

8. a. What is the total amount of formal cash transfers received in the last 12 months by the members of the household?	[monetary value in local currency]
b. How often have you or other members of the household received formal cash transfers in the last 12 months? [Please ask this question only if question 8a is greater than 0. In case of multiple cash transfers, please refer to the most frequent one].	[1 = daily; 2 = weekly; 3 = biweekly; 4 = monthly; 5 = bimonthly; 6 = quarterly; 7= twice a year; 8 = only once/lump-sum]
c. Have the cash transfers been received regularly in the last 12 months? [Please ask this question only if question 8a is greater than 0 and 8b different from 8. In case of multiple cash transfers, please refer to the most frequent one].	[1 = yes 0 = no]
9. a. What is the total amount of formal in-kind transfers received in the last 12 months by the household members?	[monetary value in local currency]
b. How often have you or other members of the household received formal in-kind transfers in the last 12 months? [Please ask this question only if question 9a is greater than 0. In case of multiple in-kind transfers, please refer to the most frequent one].	[1 = daily; 2 = weekly; 3 = biweekly; 4 = monthly; 5 = bimonthly; 6 = quarterly; 7= twice a year; 8 = only once/ lump-sum]
c. Have the in-kind transfers been received regularly in the last 12 months? [Please ask this question only if question 9a is greater than 0 and 9b different from. In case of multiple in-kind transfers, please refer to the most frequent one].	[1 = yes 0 = no]
10. What is the total amount of informal transfers[1] received in the last 12 months by the members of the household?	[monetary value in local currency]
11. Are members of this household formally participating in a local group/association, such as farmers groups, women support groups, youth groups, business associations, unions, etc.? If so, how many of these associations can provide support in case of need?	[number]
12. How many relatives/friends/family members can the household members rely on in case of need?	[number]
13. Did your household insure the household owned herd with index-based livestock insurance? a. If Yes – entire herd? b. If partially, so which type of livestock?	[1 = yes 0 = no]

Adaptive Capacity (AC)

14. Can the head of the household read and write?	[1 = yes 0 = no]
15. How many years has the household head attended secondary school?	[number]
16. How many years has the household member with the highest level of education?	[number]
17. On average, how many years have the household members of working age (>18 and <60 years old) attended formal school?	[number]
18. In the past 12 months, have the household members attended trainings for better pastoral practice/techniques?	
19. In the past 12 months, wat percentage of the household's overall income was generated by?	[%]
a. Livestock products	
b. Family business (other than livestock)	
• Government wage and salary	
• Private sector wage and salary	
• Transfers and social assistance	
• Other	
20. Over the past 12 months, what is the total value of loan (s) received by household members?	[monetary value in local currency]
21. Has your family managed to prepare (slaughter livestock) enough meat for your family consumption until the next slaughter season?	[1 = yes 0 = no]
22. Did your family manage to prepare enough hay and fodder for your livestock to survive the winter and spring?	[1 = yes 0 = no]
23. a. Have the household members received any training in the last 12 months? (if "Yes", go to question 23b)	[1 = yes 0 = no]
b. if "Yes" which type of training	[1 = good agricultural practices; 2 = livestock management; 3 = agribusiness and value addition; 4 = vocational training; 5 = other]
24. Have the livestock owned by the household received any vaccination in the last 12 months?	[1 = yes 0 = no]

Food Security (FS) (Last 6 months – since the survey is related to harsh wither disaster)

During the last 12 months, was there a time when: 25. You or others in your household worried about not having enough food to eat because of a lack of money or other resources?	0 No 1 Yes 98 Don't Know 99 Refused
26. Still thinking about the last 12 months, was there a time when you or others in your household were unable to eat healthy and nutritious food because of a lack of money or other resources?	0 No 1 Yes 98 Don't Know 99 Refused
27. Was there a time when you or others in your household ate only a few kinds of foods because of a lack of money or other resources?	0 No 1 Yes 98 Don't Know 99 Refused
28. Was there a time when you or others in your household had to skip a meal because there was not enough money or other resources to get food?	0 No 1 Yes 98 Don't Know 99 Refused
29. Still thinking about the last 12 months, was there a time when you or others in your household ate less than you thought you should because of a lack of money or other resources?	0 No 1 Yes 98 Don't Know 99 Refused
30. Was there a time when your household ran out of food because of a lack of money or other resources? (if "Yes", go to question 30a). a. Did it happen in the past 4 weeks (30 days)? (if "Yes", go to question 30b).	0 No 1 Yes 98 Don't Know 99 Refused
b. How often did this happen in the past 4 weeks (30 days)?	[2 = rarely (1 or 2 times) 3 = sometimes (3-10 times) 4 = often (more than 10 times) 98 = don't know 99 = refused]
31.Was there a time when you or others in your household were hungry but did not eat because there was not enough money or other resources for food? (If "Yes", go to question 31a and 31b). a. Did it happen in the past 4 weeks (30 days)? (if "Yes", go to question 32b).	0 No 1 Yes 98 Don't Know 99 Refused
b. How often did this happen in the past 4 weeks (30 days)?	[2 = rarely (1 or 2 times) 3 = sometimes (3-10 times) 4 = often (more than 10 times) 98 = don't know 99 = refused]
32.Was there a time when you or others in your household went without eating for a whole day because of a lack of money or other resources? (if "Yes", go to question 33a and 33b). a. Did it happen in the past 4 weeks (30 days)? (if "Yes", go to question 32b).	0 No 1 Yes 98 Don't Know 99 Refused
b. How often did this happen in the past 4 weeks (30 days)?	
FOOD EXPENDITURE AND CONSUMPTION	
33. What is the amount of money spent on the food consumed by the household members during the past 7 days?	[monetary value in local currency]
34. What percentage of your income is used for buying food?	[%]
35. Can you quantify how much your household consumed in the past 7 days using credit (because of inability to cover the cost)?	
36. Can you quantify how much your household consumed in the past 7 days from its own production?	
37. Can you quantify how much your household consumed in the past 7 days from assistance/gifts?	
38. Over the past 7 days,[1] how many days have the household members consumed [FOOD GROUP]?	[number of days]
•Cereals (e.g. rice, millet, wheat, millet or any other grains or foods made from these bread, noodles, porridge or other grain products)	
•White tubers and roots (potatoes, yellow beet, beetroot)	
•Vitamin A rich vegetables and tubers (carrot, red sweet pepper, pumpkin, squash, sweet potato that are orang)	
•Dark green leafy vegetables (e.g. kale, spinach, broccoli etc.)	
•Other vegetables (e.g. onion, tomato, eggplant)	
•Vitamin A rich fruits (e.g. fresh or dried apricot, peach, and 100% fruit juice made from these)	

•Other fruits (sea buckthorn and other fruits including wild fruits and 100% fruit juice made from these)	
•Organ meat (liver, kidney, heart or other organ meats or blood-based foods)	
•Flesh meat (meat of any livestock, pork, chicken)	
•Eggs	
•Fish and seafood	
•Milk and milk products	
•Legumes, nuts and seeds (dried beans, dried peas, lentils, nuts, seeds or foods made from these (eg. hummus, peanut butter)	
•Oils, fats (oil, fats or butter added to food or used for cooking)	
•Sweets (sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes)	
•Spices, condiments, beverages (spices (black pepper, dill, salt), condiments (soy sauce, hot sauce), tea, coffee, alcoholic beverages	

Shocks

39. What are the most severe shocks faced by the household in the last 12 months?	[open answer]
40. What did the household members do to cope with the shocks?	[open answer]

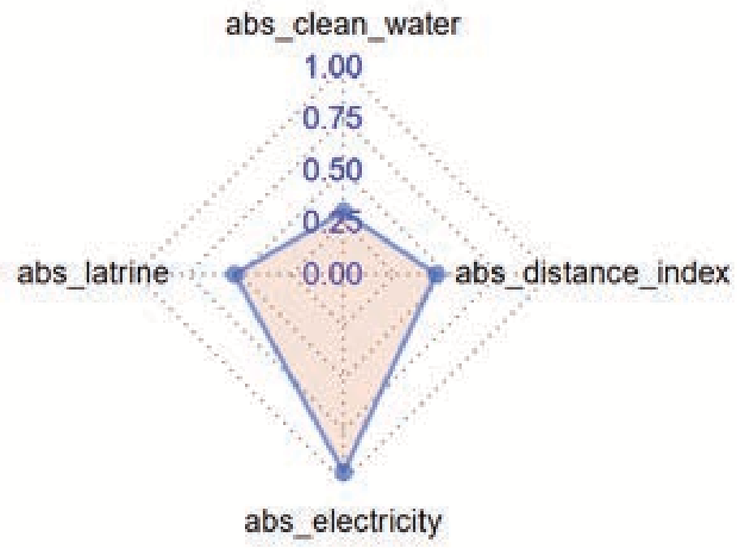
Household demographic characteristics

41. Gender of household head	[1 = male 2 = female]
42. Single parent	[1 = yes 0 = no]
43. Total number of members of the household (Adults and children)	[number]
44. Total number of household members of working age (>18 and <60 years old)	[number]
45. Region *(aimag, soum)*	
46. Household state registry code	
47. Mobile phone number	

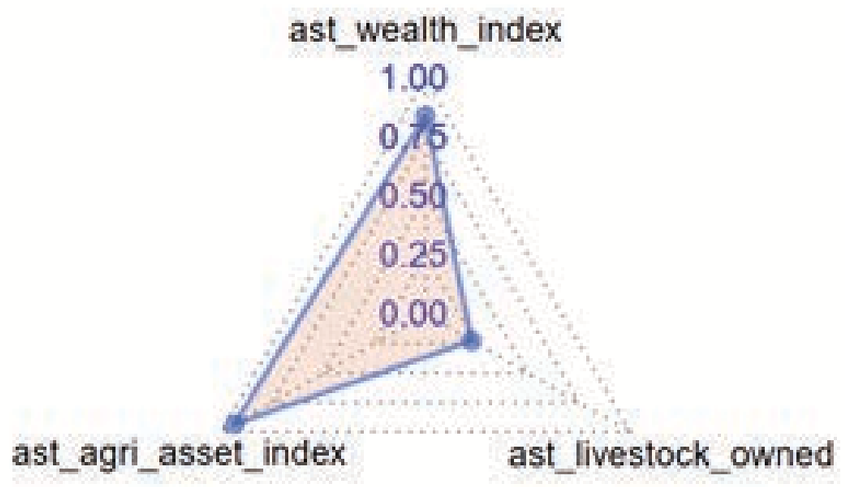
ANNEX III

VARIABLE CORRELATIONS WITH RESILIENCE PILLARS AND CORRELATION BETWEEN VARIABLES

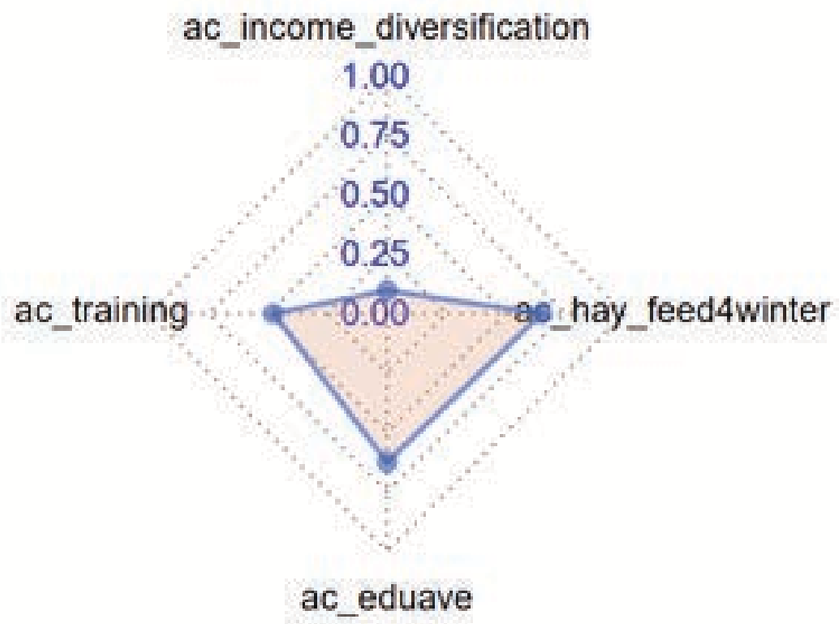
Correlation of variables with the ABS pillar



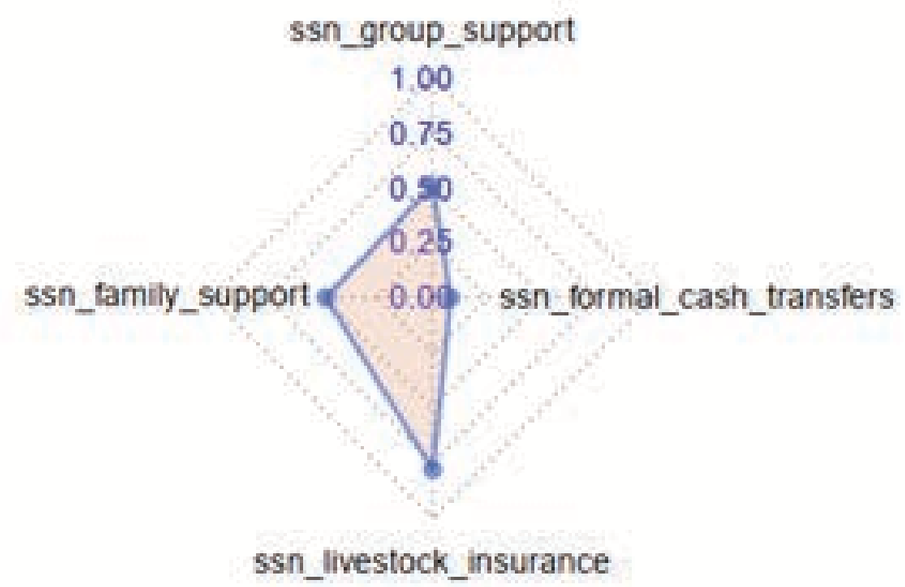
Correlation of variables with the AST pillar

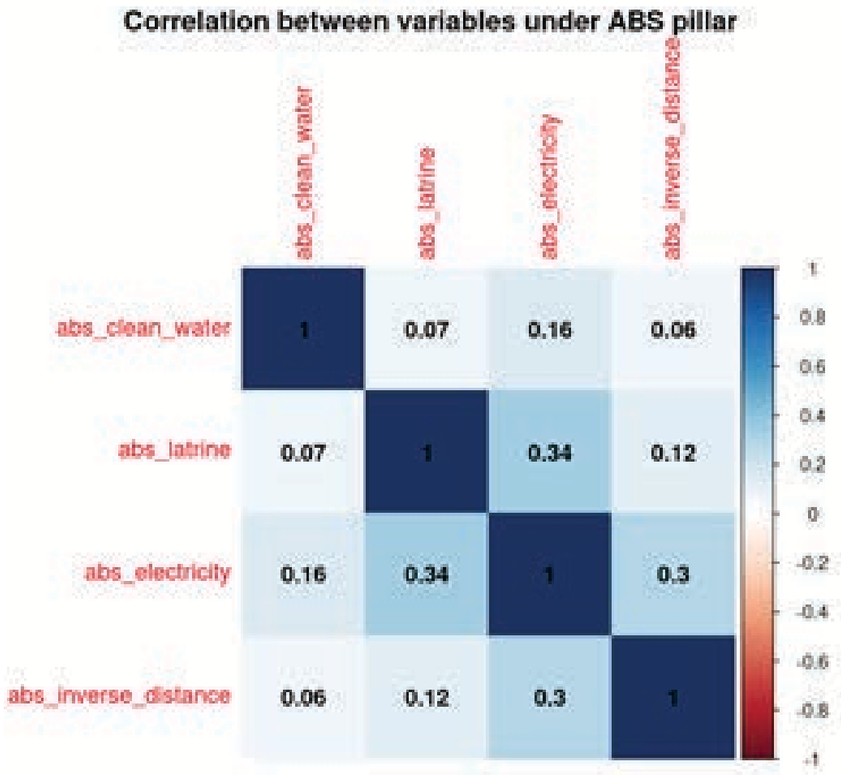


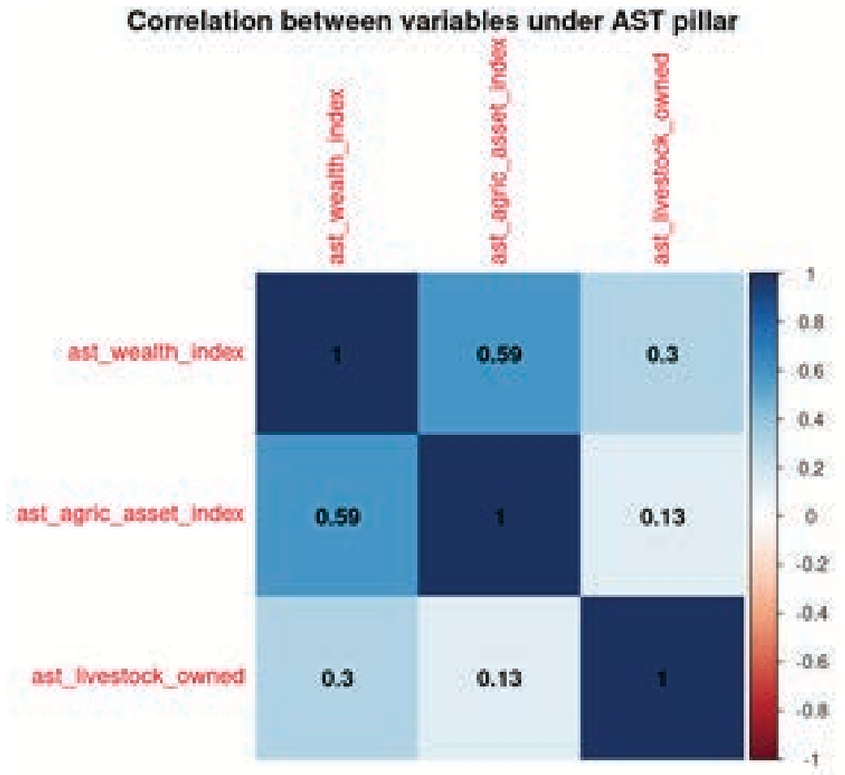
Correlation of variables with the AC pillar

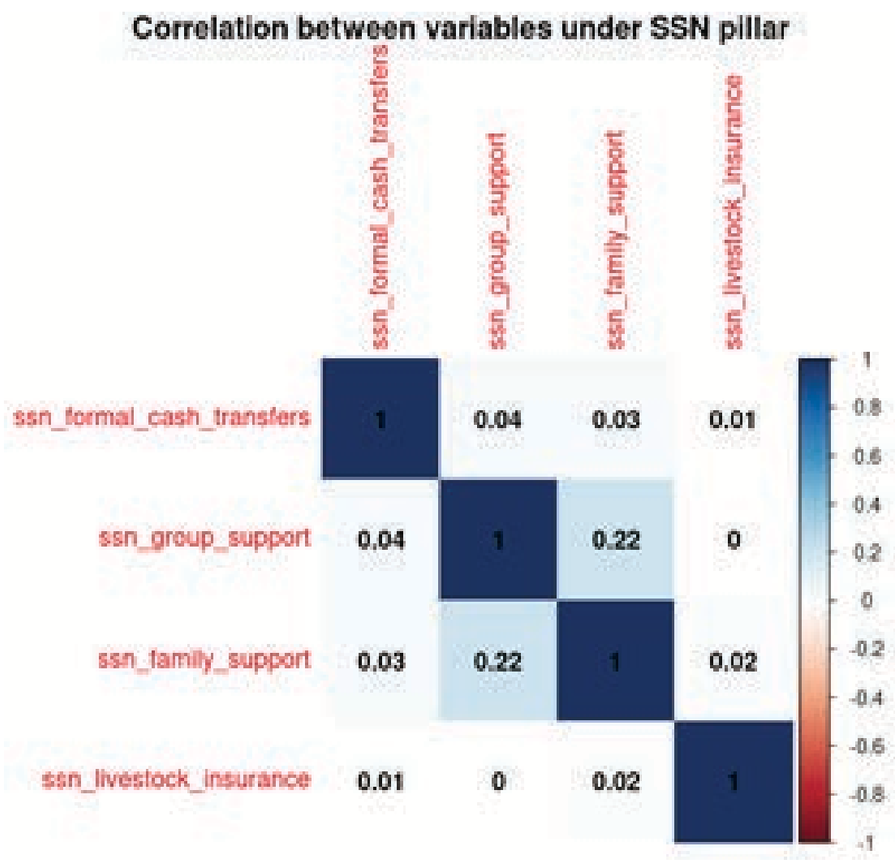


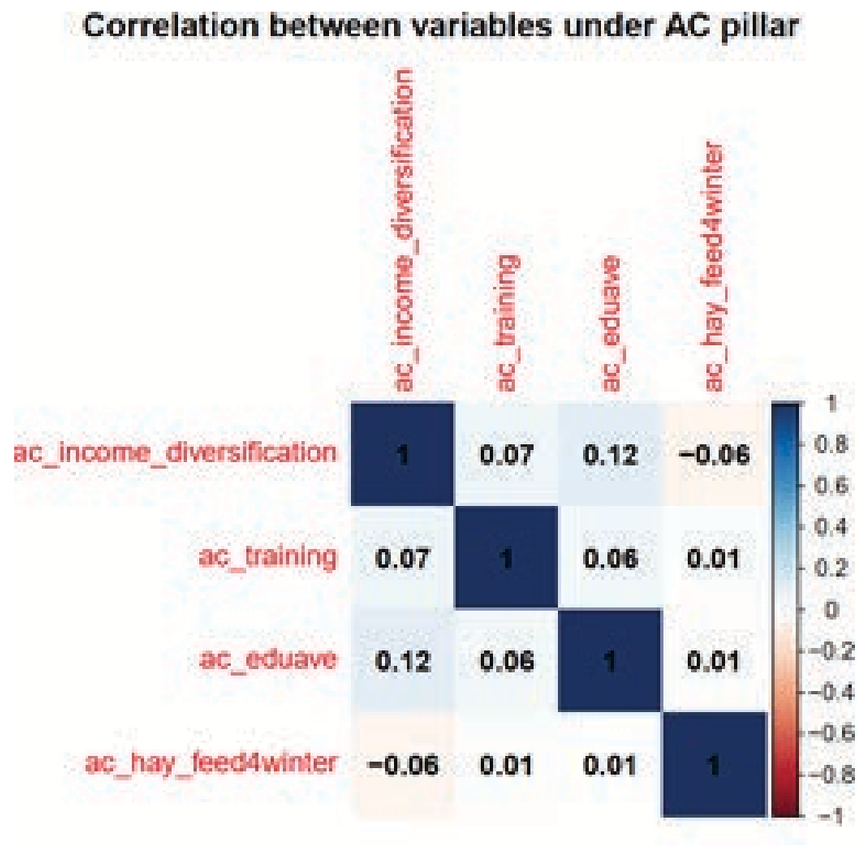
Correlation of variables with the SSN pillar



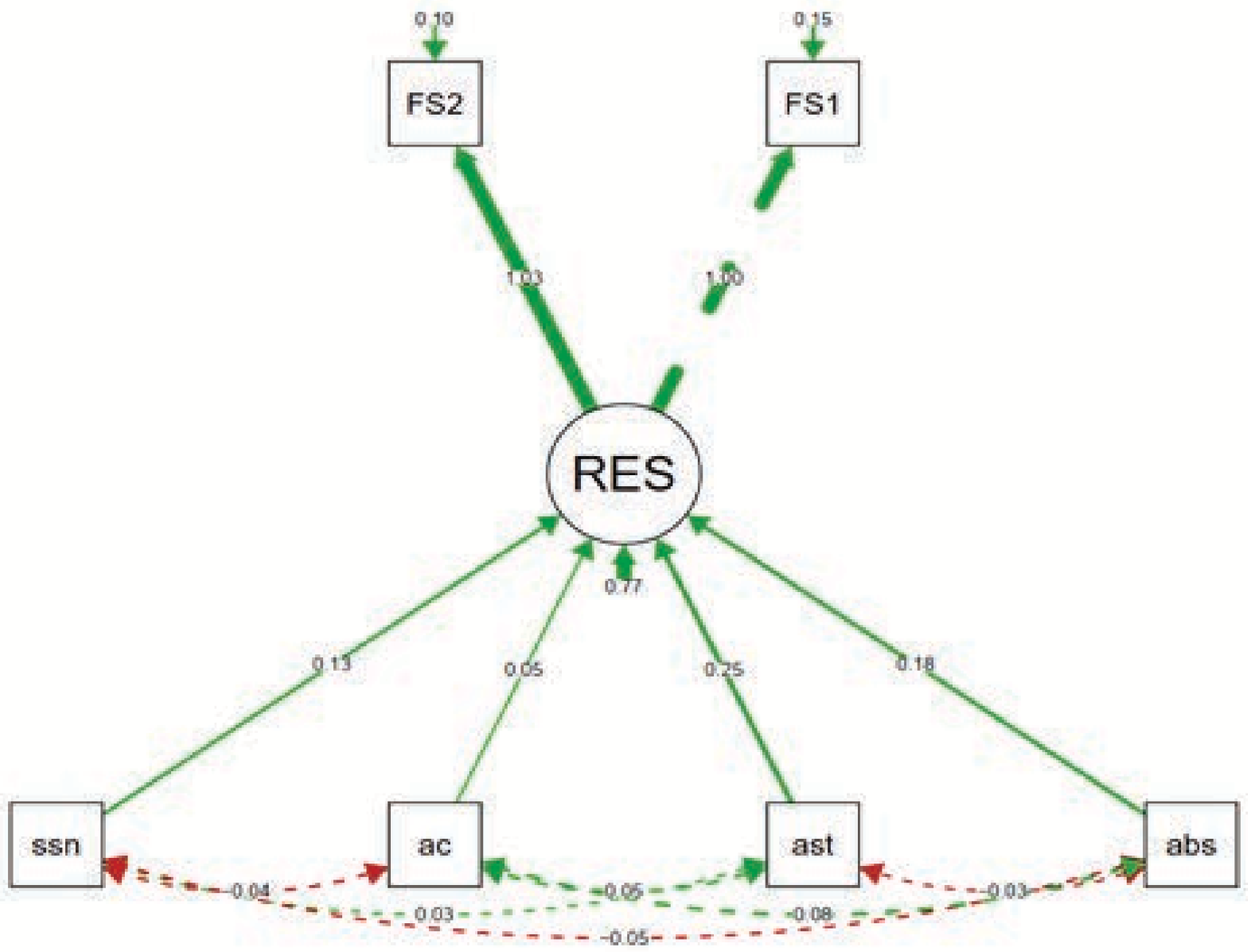








The path graph shows the causal relationships between variables. The line indicates the direction of impact, while the coefficient represents the connection strength.



ANNEX IV

LINEAR REGRESSION RESULTS

Resilience capacity	Coef.	St.Err.	p-value	Sig
Improved water source	0.10	0.02	-	***
Improved sanitation	0.17	0.02	-	***
Access to electricity	0.20	0.03	-	***
Distance to main services	0.03	0.01	0.01	**
Wealth index	1.12	0.09	-	***
Agricultural asset index	0.52	0.09	-	***
Large livestock units per capita	0.00	-	-	***
Received formal cash transfer	(0.11)	0.03	0.00	***
Support from association	0.01	0.02	0.62	
Support from family	0.02	0.00	-	***
Livestock insurance	0.13	0.03	-	***
Attended training	(0.01)	0.04	0.81	
Hay and fodder sufficiency	(0.02)	0.02	0.32	
Income diversification	0.21	0.02	-	***
Average years of education	0.02	0.00	-	***
Shock: Dzud	(0.12)	0.02	-	***
Shock: Covid	0.17	0.02	-	***
Shock: Disease	0.00	0.03	0.96	
Shock: Drop in cashmere prices	0.09	0.02	-	***
Shock: Drop in prices of meat and livestock raw materials	0.05	0.02	0.02	**
Shock: Divorce	0.13	0.12	0.29	
Shock: Unemployment	(0.01)	0.03	0.69	
Shock: Market shock input/output price fluctuations	0.03	0.02	0.18	
Area: base = peri-urban				
rural	(0.16)	0.12	0.17	
Province: base = Arkhangai				
Bayan-Ulgii	(0.33)	0.06	-	***
Bayankhongor	0.13	0.05	0.02	**
Bulgan	(0.09)	0.05	0.06	*
Darkhan-Uul	0.39	0.14	0.01	***
Dornod	(0.06)	0.06	0.32	
Dornogovi	0.43	0.06	-	***
Dundgovi	(0.18)	0.05	0.00	***
Govi-Altai	(0.10)	0.05	0.05	**
Govisumber	(0.23)	0.07	0.00	***
Khentii	0.18	0.06	0.00	***
Khovd	(0.05)	0.06	0.35	
Khuvsgul	(0.24)	0.04	-	***
Orkhon	(0.34)	0.19	0.07	*
Selenge	(0.07)	0.06	0.23	
Sukhbaatar	0.03	0.05	0.54	
Tuv	(0.02)	0.05	0.71	
Ulaanbaatar	0.37	0.15	0.01	**
Umnugovi	(0.15)	0.06	0.01	***
Uvs	(0.29)	0.05	-	***
Uvurkhangai	(0.08)	0.05	0.11	
Zavkhan	(0.31)	0.05	-	***
Househod characteristics				
Single parent household	(0.12)	0.02	-	***
Female-head household	0.11	0.03	0.00	***
Number of working are member	0.00	0.01	0.70	
Square of household size	0.00	0.00	0.07	*
Constant	(1.16)	0.13	-	***

***p<., **p<.05, *p<.1

ANNEX V

NUMBER OF INTERVIEWED HERDER HOUSEHOLDS, BY PROVINCES

#	Aimag name	# of soums	# of HHs	Per soum average # HHs
1	Arkhangai	19	592	31
2	Bayan-Ulgii	13	412	32
3	Bayankhongor	20	618	31
4	Bulgan	16	489	31
5	Govi-Altai	18	554	31
6	Govisumber	3	90	30
7	Darkhan-Uul	4	131	33
8	Dornogov	14	334	24
9	Dornod	14	411	29
10	Dundgovi	15	455	30
11	Zavkhan	24	755	31
12	Orkhon	2	60	30
13	Uvurkhangai	19	572	30
14	Umnugovi	15	472	31
15	Sukhbaatar	13	392	30
16	Selenge	17	516	30
17	Tuv	27	809	30
18	Uvs	19	569	30
19	Khovd	17	498	29
20	Khuvsgul	23	708	31
21	Khentii	18	401	22
22	Ulaanbaatar	6	185	31
	∑	**336**	**10023**	**^30**

This report is part of a series of country level analysis prepared by the FAO Resilience Analysis and Policies (RAP) team. The series aims at providing programming and policy guidance to policy makers, practitioners, UN agencies, NGOs and other stakeholders by identifying the key factors that contribute to the resilience of households in food insecure countries and regions. The analysis is largely based on the use of the FAO Resilience Index Measurement and Analysis (RIMA) tool.

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