GERMAN - MONGOLIAN INSTITUTE FOR RESOURCES AND TECHNOLOGY

The present work was submitted to
the German-Mongolian Institute of Resources and Technology

ADAPTING THE TOWARDS SUSTAINABLE MINING, SAFE HEALTHY AND RESPECTFUL WORKPLACE PROTOCOL FOR MONGOLIAN MINING COMPANIES

Bachelor's Thesis

By

NINJIN Norovrentsen

Study program: Industrial Engineering

Student ID: B2200428

1st Supervisor/Examiner: Prof. Dr. Enkhzaya Chuluunbaatar

2nd Supervisor/Examiner: Dr. Bolormaa Purevjav

Ulaanbaatar/Nalaikh

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Statutory Declaration

Norovrentsen, Ninjin B2200428

I hereby affirm in lieu of an oath that I provided the submitted bachelor thesis

ADAPTING THE TOWARDS SUSTAINABLE MINING, SAFE HEALTHY AND RESPECTFUL WORKPLACE PROTOCOL FOR MONGOLIAN MINING COMPANIES

I did not use any sources other than those stated. In case that the work is additionally submitted on a data medium, I declare that the written and the electronic form are completely identical. The work was not submitted in the same or similar form to any examination authority.

2026/5/28

Place, Date

Signature

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Abstract

This study examines the implementation of the Safe, Healthy and Respectful Workplace (SHRW) protocol within Mongolia's mining sector, following the country's adoption of the Towards Sustainable Mining (TSM) framework in 2024. Employing a mixed-methods approach across two mining companies at different stages of TSM adoption, the research identifies five critical implementation gaps: ambiguity between legitimate enforcement and workplace harassment, a trust deficit in reporting channels, assessment inflation driven by documentation rather than actual practice, contextual distance between the framework's language and Mongolian mining realities, and a lack of functional TSM understanding among the broader workforce.

In response to these findings, the study develops and refines a practical implementation handbook specifically designed for Mongolian mining companies. The empirical findings contributed in two ways: they validated the handbook's theoretically grounded structure, and they produced four targeted additions — a decision framework distinguishing legitimate enforcement from harassment, a structured self-assessment toolkit including behavioral evidence checklists and frontline worker inclusion, context-specific Mongolian mining scenarios with observable KPI examples, and operational confidentiality protocols paired with mandatory feedback requirements for reporting mechanisms.

Keywords: TSM, Safe Healthy and Respectful Workplace, Mongolian mining, Indicator 3, implementation handbook, workplace culture

List of Abbreviations

Abbreviation	Full Term
DOI	Diffusion of Innovation
EDI	Equity, Diversity, and Inclusion
ESG	Environmental, Social, and Governance
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GMIT	German-Mongolian Institute for Resources and Technology
ISO	International Organization for Standardization
ISO 45001	Occupational Health and Safety Management Systems Standard
KPI	Key Performance Indicator
MAC	Mining Association of Canada
MNMA	Mongolian National Mining Association
OC	Organizational Change
RBV	Resource-Based View
SHRW	Safe, Healthy and Respectful Workplace
ToSMM	Towards Sustainable Mining in Mongolia
TSM	Towards Sustainable Mining

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Chapter 1: Introduction

1.1 Background

Environmental, social, and governance (ESG) criteria have become the standard lens through which investors, regulators, and civil society evaluate corporate responsibility (1). Environmental criteria address impacts on land, water, air, and biodiversity. Social criteria concern worker safety, community relations, and workplace culture. Governance criteria relate to transparency, accountability, and ethical decision-making.



Figure 1: Core ESG pillars of responsible business

Mining faces ESG pressures that differ from other industries. Operations are site-specific, long-duration, and deeply embedded in local ecosystems and communities (2). They involve hazardous conditions, large-scale environmental disturbance, and complex relationships with host populations. Generic ESG frameworks do not capture these risks. Mining specific sustainability frameworks were developed to fill this gap.

Towards Sustainable Mining (TSM) framework is one such response. Developed by the Mining Association of Canada (MAC) in 2004, TSM evaluates mining operations across nine protocols and 34 indicators using a maturity scale from Level C to Level AAA. Unlike broad ESG frameworks, it requires site-level assessment, independent verification, and public reporting (3).

Mongolia's mining sector illustrates this challenge directly. The sector contributed approximately 25% of GDP in 2025 and a substantial share of export revenue, making it

central to the country's economic trajectory (4). In 2024, the Mongolian National Mining Association (MNMA) introduced TSM to the sector, making Mongolia the twelfth country and third in Asia to adopt the framework (5). Two companies currently represent the reality of TSM adoption in Mongolia. Energy Resources Mongolia has been actively implementing TSM since 2023. Erdenet Mining Corporation, one of Mongolia's largest mining enterprises, has established a dedicated working group to prepare for adoption but has not yet begun implementation.

However, having a strong framework does not mean companies will implement it properly. Institutional theory indicates that companies often adopt international standards to gain legitimacy rather than to change actual practices. They seek to satisfy investors or secure social license, not to transform daily operations. Meyer and Rowan (6) call this "decoupling": policies look good on paper, but daily operations stay the same. This risk grows when a framework is transferred from one country to another without adaptation.

The risk is highest for areas that depend on human behavior, not procedural systems. In mining, safety is the first priority. Companies invest heavily in physical safety: equipment, procedures, inspections, and training. But physical safety alone is not enough. Workers also need to feel mentally safe. When workers feel psychologically safe, they speak up about hazards, report near misses, and follow procedures without fear. When they do not, risks go unnoticed and incidents increase. Psychological safety supports physical safety.

The Safe, Healthy and Respectful Workplace (SHRW) protocol covers both dimensions. It addresses occupational safety, health management, psychological safety, respectful behavior, and training culture. It has six indicators. Indicator 3 (Psychological Safety and Respectful Behavior) stands apart (7). It requires workplaces where workers feel safe to speak openly, raise concerns, and report problems without fear of retaliation. These requirements assume a certain workplace culture, authority structure, and individual agency. These assumptions do not transfer automatically from one country to another.

No published research examines how the TSM SHRW protocol should be adapted for Mongolian mining companies. This thesis addresses that gap, with particular focus on Indicator 3 (Psychological Safety and Respectful Behavior).

1.2 Research objective

To develop a practical implementation handbook for the TSM Safe, Healthy and Respectful Workplace protocol, adapted for Mongolian mining companies, with particular

focus on Indicator 3 (Psychological Safety and Respectful Behavior).

1.3 Main research question and sub-questions

How can the TSM SHRW implementation handbook be structured and adapted to bridge the gap between protocol requirements and the organizational realities of Mongolian mining companies? To answer this question, the thesis breaks the handbook development process into the following four stages.

1. How should the handbook be structured to support effective implementation of the SHRW protocol? This determines the most effective organizational framework and layout to ensure practical, on-the-ground usability.
2. What step-by-step implementation guidance should the handbook contain for each SHRW indicator, particularly Indicator 3? This defines the detailed, actionable procedural content needed for users to follow a clear path from understanding requirements to executing them.
3. What data should be collected from Mongolian mining companies to test and improve the handbook, and what do the findings reveal about barriers, awareness gaps, and workplace conditions? This establishes the empirical foundation for ground-truthing the handbook against actual compliance challenges, awareness levels, and operational realities in Mongolian mining settings.
4. What specific improvements should be made to the handbook based on the empirical findings? This identifies the targeted revisions, additions, and refinements warranted by the gaps and patterns uncovered through the collected data.



Figure 2: Research framework

1.4 Scope and limitations

This thesis focuses on one TSM protocol: the Safe, Healthy and Respectful Workplace (SHRW) protocol, with particular depth on Indicator 3 (Psychological Safety and Respectful Behavior). The survey covers seven of TSM's nine protocols. Two protocols, crisis management and prevention of child and forced labor, are not included because the project team does not evaluate them.

The study examines two selected Mongolian mining companies. One company has been implementing the TSM initiative since 2023, while the other is preparing for adoption but has not yet begun implementation. This contrast was intentional. One company provides insight into implementation experience, while the other reflects pre-adoption readiness. The identities of the companies are not disclosed in this thesis to maintain organizational

confidentiality. However, findings from two companies cannot represent the entire Mongolian mining sector.

The study does not include perspectives from community members, regulators, or suppliers. It also does not measure whether the handbook works after implementation. That would require a follow-up study over a longer period than this thesis allows.

Chapter 2: Literature review

2.1 Towards Sustainable Mining Framework: structure and global Adoption

TSM is a site-level framework for evaluating sustainability performance in mining. It has nine protocols, each covering a distinct area of mining responsibility.

Table 1: TSM protocols and their focus areas

#	Protocols	Focus
1	Indigenous and Community Relationships	Engagement with local communities and herders affected by mining
2	Crisis Management and Communications Planning	Preparedness and response systems for emergencies
3	Safe, Healthy and Respectful Workplaces	Worker safety, health, psychological safety, and respectful behavior
4	Equitable, Diverse and Inclusive Workplaces	Diversity, equity, and inclusion in workforce practices
5	Prevention of Child and Forced Labour	Safeguards against child labor and forced labor in operations and supply chains

6	Tailings Management	Safe storage and monitoring of mining waste
7	Biodiversity Conservation Management	Protection of ecosystems and biodiversity near mining sites
8	Water Stewardship	Responsible water use and protection of water sources
9	Climate Change	Greenhouse gas emissions management and climate adaptation

All nine protocols are assessed using the same five-level maturity scale, from Level C (no systematic approach) to Level AAA (industry-leading performance). This allows consistent evaluation across all areas. TSM further strengthens credibility through site-level assessment, independent verification, and public reporting (3).

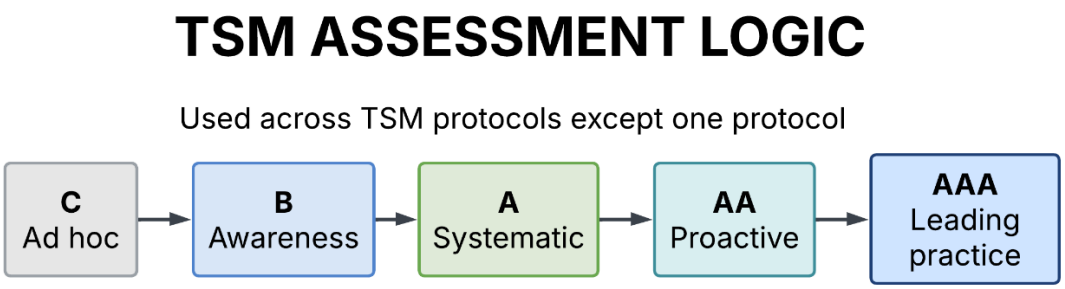

Figure 3: TSM maturity scale (Levels C to AAA)

Since 2004, TSM has expanded to twelve countries across six continents. This raises a question: can a framework designed in Canada function in a different institutional context? Finland's experience suggests it can, with adaptation. The Finnish Mining Association adjusted the Indigenous and Community Relationships protocol for the Sami community. It retained the core scoring system but changed the protocol content to reflect local stakeholder relationships (8). This confirms that contextual adaptation within TSM is both possible and necessary. However, no equivalent adaptation has been conducted for Mongolia.

2.2 How TSM differs from International Organization for Standardization (ISO)

Many Mongolian mining companies already hold ISO certifications. ISO 45001, for example, certifies that a safety management system exists. It checks whether policies are documented, procedures are in place, and audits are conducted. TSM asks a different question. It does not stop at whether a system exists. It measures whether that system is actually experienced by workers in their daily work.

A company can pass ISO certification and still have workers who have never read the safety policy (9). It can have a reporting system that no one trusts. ISO measures whether the structure is in place. TSM measures whether the structure produces results. This is the core difference.

The difference matters for this thesis. Chuluunbaatar E and Ganbaatar O (10) found that ISO-certified departments at Energy Resources Mongolia performed better on TSM indicators. Existing documentation, audit culture, and management systems provide a foundation. But that foundation has limits. ISO does not measure whether workers feel psychologically safe, whether they trust reporting mechanisms, or whether respectful behavior is enforced. These are Indicator 3 requirements. No ISO standard addresses them. TSM goes beyond ISO in this area, and that is where the implementation challenge is greatest.

2.3 The SHRW Protocol and its Indicator 3

The SHRW protocol has six indicators. Each covers a different aspect of workplace safety, health, and culture.

Table 2: SHRW Protocol Indicators

#	Indicator	Focus	Nature
1	Commitment and Accountability	Leadership responsibility for safety and health	Procedural
2	Safety and Health Management Systems	Systematic risk management and controls	Procedural
3	Psychological Safety and Respectful Behavior	Workplace culture, reporting mechanisms, mental health	Behavioral and cultural

4	Training, Behavior and Culture	Workforce training and safety culture development	Behavioral and cultural
5	Monitoring and Reporting	Performance tracking and public disclosure	Procedural
6	Physical Safety and Health Performance	Measurable safety outcomes	Outcome-based

Five of these indicators build on familiar ground. Companies with ISO 45001 experience already have systems that partially address Indicators 1, 2, 4, 5, and 6. They have documented policies, risk assessments, training records, and audit processes. These indicators require stronger performance than ISO demands, but the starting point is not zero.

Indicator 3 is different. It is the newest addition to the SHRW protocol. It does not ask whether a system exists. It asks whether workers feel safe to speak up, whether they trust reporting mechanisms, and whether respectful behavior is enforced in daily practice. These are questions about culture, trust, and human behavior. No management system can answer them on paper. The protocol defines specific requirements at each maturity level for Indicator 3.

Table 3: Maturity level of indicator 3 (Psychological Safety and Respectful Behavior)

Level	**Key Requirements**
C	Does not meet Level B criteria
B	Action Plan to meet Level A requirements. Mechanism for workers to report psychological safety incidents
A	Policies reviewed to integrate psychological safety. Mental health and wellness programs. Worker communication of policies. Trauma-informed reporting and response processes including informal resolution and confidential, impartial complaint mechanisms
AA	Stakeholder collaboration to review reporting processes. Supply chain communication of policies. Performance objectives with action plans and progress reporting. Worker mental health support program

AAA	Internal audit at least every three years engaging underrepresented perspectives. Public reporting of audit results. Integration of psychological safety into procurement and contractor relationships

The requirements are clear. The protocol defines what a company must achieve at each level. It does not prescribe how to build these systems, in what order, or with what resources. This is the gap the handbook in this thesis fills.

There is a second challenge. The concepts behind Indicator 3 come from Western organizational research. Edmondson (11) identified psychological safety as a shared belief that a team is safe for interpersonal risk-taking . Her research studied American hospital teams with relatively flat hierarchies. Clark (12) described psychological safety as four stages: inclusion safety, learner safety, contributor safety, and challenger safety. Both frameworks treat speaking up and questioning authority as positive behaviors.

In mining, this is more complicated. A worker who questions a supervisor's instruction to stop work in a hazardous zone is not speaking up constructively. That worker is creating danger. Psychological safety in mining must protect the right to report concerns without weakening the authority to enforce safety rules. Both are necessary. The challenge is balancing them.

This balance is harder to achieve in Mongolia. Mining operations are hierarchical. Cultural norms favor respect for authority and group harmony. Rotational shifts limit team continuity. These conditions do not prevent psychological safety. They require a different approach than models developed in Western settings. This is why adaptation is necessary, and why Indicator 3 is the focus of this thesis.

2.4 TSM Implementation in Mongolia

The most directly relevant prior study is Chuluunbaatar E and Ganbaatar O (10), which examined TSM implementation at Energy Resources Mongolia. Energy Resources is the first and currently only Mongolian company to complete a full TSM cycle including external verification. The study surveyed 69 operational staff and interviewed 11 departmental managers.

The findings reveal a gap between formal adoption and actual understanding. Nearly 70% of workers reported being unfamiliar with TSM practices and protocols, despite the company having formally adopted the framework. At the same time, over 65% rated sustainable mining as "important" or "most important". Workers support the idea. They do not know how to apply it. The barrier is not resistance. It is the absence of practical, accessible guidance.

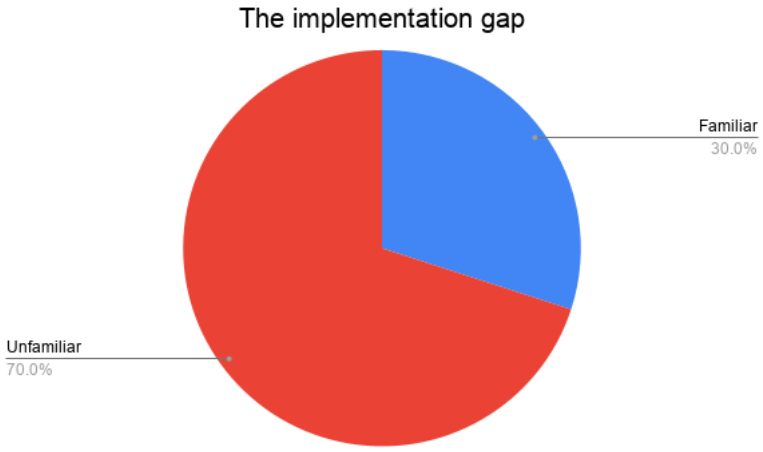

Figure 4: Worker awareness of the TSM framework

Through Multi-Criteria Decision Analysis, the study ranked implementation barriers by priority. Training and knowledge gaps ranked highest, followed by resource constraints and communication and language difficulties (10). This ranking confirms that the problem is informational, not motivational. Workers want to participate. They lack the tools and knowledge to do so.

The publicly available TSM verification report for Energy Resources' Ukhaa Khudag mine (2024) provides additional context. Under the previous Safety and Health protocol, the facility scored as follows:

Table 4: Energy Resources Ukhaa Khudag Mine TSM Safety and Health Verification Results (2024). Source: TSM Verification Report, 2024

Indicator (Previous Protocol)	Score	Notes
1. Commitments and Accountability	AAA	Verified against ISO 45001 checklist. ISO 45001 certification held in 2022

Indicator (Previous Protocol)	Score	Notes
2. Planning and Implementation	AAA	Risk assessments, workplace inspections confirmed
3. Training, Behaviour and Culture	AAA	Trainer evaluation system, training records verified
4. Monitoring and Reporting	AAA	Internal and external audits conducted. Safety performance publicly reported
5. Performance	B	Three occupational fatalities in 2023

The pattern is significant. The facility scored AAA on all four procedural indicators. It scored Level B on performance. Three workers died within a six-month period in 2023. A facility with a fatality in the reporting year cannot score above Level B on the performance indicator. The company met every procedural requirement at the highest level. It still produced fatal outcomes.

This illustrates the limits of procedural maturity. The previous protocol measured whether safety systems existed and functioned. It did not measure whether workers could act on those systems. It did not ask whether workers felt able to stop unsafe work, report concerns, or raise issues without fear. Indicator 3 was introduced to address exactly this gap. These scores were achieved under the previous protocol structure, before the SHRW protocol introduced Indicator 3 as a distinct requirement. Energy Resources has not yet been assessed against Indicator 3.

Chapter 3: Towards Sustainable Mining, Safe Healthy and Respectful Workplace Handbook Design

3.1 Purpose and Design Logic of the Handbook

The TSM SHRW protocol defines what mining companies must achieve at each maturity level, but it does not explain how to get there. A company knows it needs trauma-informed reporting processes, mental health programs, and confidential complaint mechanisms. It does not know what to build first, who should be responsible, or how to move

from Level C towards Level AAA. The handbook fills this gap with a structured, step-by-step pathway that a Mongolian mining company can follow.

The handbook was built in four layers. The first is structure. Three theoretical frameworks, Diffusion of Innovation (13), Organizational Change (14), and Resource-Based View (15), determined how the handbook is organized. They shaped what sections exist, what each section does.

The second is content. ISO 45001 and international best practices from TSM-implementing countries - provided the substance within each section, ensuring that recommendations reflect proven approaches.

The third is implementation steps. The protocol's five-level maturity scale defines a natural progression. The handbook translates this into a sequence: what to do first for Level B, what systems to add for Level A, and what capabilities to develop for AA and AAA. Survey results from the selected sites, focus group findings, and observations were used to improve the handbook using real conditions from Mongolian mining companies.

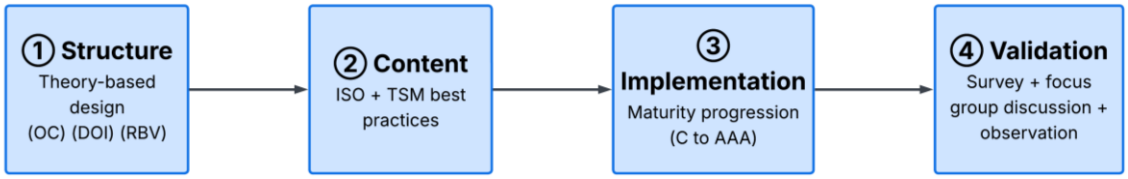

Figure 5: Four-layer framework of the handbook development process

3.2 Theoretical foundations

Three theoretical frameworks guided the design of the handbook. Each addresses a different dimension of why sustainability standards succeed or fail when adopted by organizations. The theories are not used to analyze findings after the fact. They are used to build the handbook itself.

3.2.1 Diffusion of Innovation (DOI)

Diffusion of Innovation theory explains how new practices spread through a social system. It identifies five characteristics that determine whether an innovation is adopted (13).

Table 5: DOI characteristics and their relevance to TSM in Mongolia

Characteristic	Meaning	Relevance to TSM in Mongolia
Relative advantage	Does it offer clear benefits?	Workers must see TSM as beneficial, not just an additional burden
Compatibility	Does it fit existing practices and values?	If Indicator 3 concepts feel foreign, adoption stalls regardless of management commitment
Complexity	Is it easy to understand?	Abstract terminology like "psychological safety" increases perceived complexity
Trialability	Can it be tested before full commitment?	Pilot implementation at one department before company-wide rollout
Observability	Can results be seen?	Visible improvements from early adopters encourage others to follow

This theory matters because TSM adoption does not depend only on management decisions. It depends on whether workers and organizations perceive the framework as relevant, understandable, and beneficial. A management team can commit fully to TSM. If workers see the language as abstract, the concepts as unfamiliar, and the results as invisible, the theory predicts resistance. This is especially relevant for Indicator 3, where terms like "psychological safety" have no direct equivalent in Mongolian workplace vocabulary. The handbook uses DOI in two ways: it builds the case for adoption early in the document (relative advantage and observability), and it designs pilot-based implementation to reduce perceived complexity (trialability).

3.2.2 Organizational Change (OC)

Organizational Change theory explains what must happen inside a company to move from current practice to new practice (14). Lewin's model defines three stages.

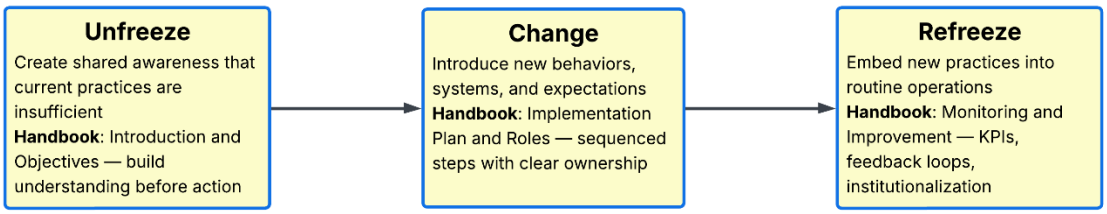

Figure 6: Lewin's change stages and handbook application

This theory explains why sequence matters. A company that moves to implementation before building shared understanding across the organization is likely to face gaps in awareness and readiness. Chuluunbaatar E and Ganbaatar O (10) observed this pattern at Energy Resources Mongolia, where formal TSM adoption preceded organization-wide training and communication. This is not uncommon for early adopters of any new framework. The finding informed the handbook's sequencing. It begins with awareness and context (unfreezing), moves to roles and implementation steps (change), and ends with monitoring and reinforcement (refreezing). The order follows the change process itself.

3.2.3 Resource-Based View (RBV)

The Resource-Based View holds that a firm's capacity to implement any initiative depends on the internal resources it possesses (15).

Table 6: Resource types and their relevance to SHRW

Resource type	Examples	Why it matters for SHRW
Tangible	Budget, dedicated staff, technology	A company without human resource professionals cannot build a confidential reporting system from scratch

Resource type	Examples	Why it matters for SHRW
Intangible	Organizational knowledge, management capability, institutional culture	A company with ISO 45001 experience has existing systems to build upon

This theory serves as a constraint on the handbook. Every recommendation is checked against a simple question: does a Mongolian mining company actually have the resources to do this? Chuluunbaatar E and Ganbaatar O (10) found that departments with pre-existing ISO certifications faced significantly fewer difficulties in TSM adoption . This confirms that existing capabilities reduce the effort needed. Companies with established management systems have a foundation to build on. Companies without them need the handbook to account for that gap. RBV ensures that the handbook does not assume resources that do not exist.

3.2.4 How Theory Shaped the Handbook Structure

The handbook has seven sections. Each section exists because a specific theoretical principle requires it. The following table maps each section to its foundation.

Table 7: Handbook structure and their theoretical foundations

Handbook Section	Theoretical Foundation	What Theory Contributes
Introduction and Context	OC + DOI	Creates readiness for change and builds the case for adoption
Objectives	OC	Defines purpose and scope, the "unfreezing" stage

Handbook Section	Theoretical Foundation	What Theory Contributes
Roles and Responsibilities	OC	Assigns ownership and accountability
Implementation Plan	OC + DOI	Provides phased steps and pilot activities for gradual adoption
Resources and Support	RBV	Ensures recommendations match available resources
Monitoring and Improvement	OC + DOI	Establishes Key Performance Indicators (KPI) and feedback loops for visible results
Conclusion and Reinforcement	DOI	Reinforces benefits to sustain long-term adoption

The sequence follows the change process. It begins with context and objectives (unfreezing), moves to roles, implementation, and resources (change), and ends with monitoring and reinforcement (refreezing). Awareness first, action second, institutionalization third.

3.3 Content and Implementation Steps

ISO 45001 provided specific content for safety management dimensions: hazard identification, risk assessment, incident investigation, management review, and worker consultation. These elements informed the handbook's guidance for Indicators 1, 2, 4, 5, and 6, supplemented by international best practices from TSM-implementing countries.

The implementation steps follow the protocol's own logic. The handbook reads the five-level maturity scale as a natural sequence: basic policies and reporting at Level B, functioning systems with worker participation at Level A, performance measurement and contractor requirements at Level AA, independent audits and public reporting at Level AAA. Each step builds on the one before it.

Implementation Steps on Indicator 3: For Indicators 1, 2, 4, 5, and 6, the integration of theoretical frameworks, ISO-based practices, and TSM protocol requirements resulted in a complete first draft of the implementation handbook. In contrast, Indicator 3 required a different approach. As a newly introduced component of the SHRW protocol, it focuses on psychological safety and respectful workplace behavior, for which no established implementation models exist in the Mongolian mining context. As a result, the initial guidance for Indicator 3 was conceptually developed but remained limited in practical application.

To address this gap, a structured seven-step implementation pathway was developed based on the protocol requirements and supporting theoretical foundations.

Table 8: Implementation pathway for indicator 3

Step	Implementation Action	TSM Level	Required Documents
1	Establish formal policies and measurable objectives to define psychological safety and respectful workplace expectations	B	Approved policy document; KPI documentation
2	Develop confidential reporting and response mechanisms that allow employees to raise concerns without fear	B	Complaint handling procedure; reporting channels; complaint register
3	Ensure fair and appropriate response to reported cases	A	Case investigation procedure; case resolution records; confidentiality and protection guideline

Step	Implementation Action	TSM Level	Required Documents
4	Implement employee support programs for psychological safety and well-being	A	Mental health program plan; counseling/support service records; training materials
5	Provide training and strengthen respectful workplace culture	A - AA	Training plan and attendance records; internal communication materials; survey or KPI results
6	Conduct independent evaluation of reporting and response systems	AA	Internal audit report; evaluation findings; stakeholder feedback records
7	Ensure continuous improvement and integration into organizational systems	AA - AAA	Improvement action plan; monitoring report; management review record

Chapter 4: Research Methodology

4.1 Research context and study design

This thesis was conducted as part of a Towards Sustainable Mining in Mongolia (ToSMM) project team at the German-Mongolian Institute for Resources and Technology (GMIT) (16), in collaboration with the Mongolian National Mining Association (MNMA) (17). The project ran from October 2025 to June 2026. The team consisted of students, alumni, professors, and subject matter experts. The team evaluates seven of TSM's nine protocols. Crisis management and prevention of child and forced labor are not included in the project scope.

Each team member is responsible for a specific protocol or set of protocols. This thesis focuses on the SHRW protocol, with particular depth on Indicator 3 (Psychological Safety and Respectful Behavior). The data collection instruments, survey design, and analysis presented in this chapter were developed for this protocol.

This study employs a mixed-methods approach, integrating both quantitative and qualitative data to provide a comprehensive understanding of the research problem. Quantitative data were collected through structured surveys administered across two participating sites, combining Likert-scale items with open-ended questions. The Likert-scale items measured levels of awareness, perceptions, and barriers among a broad sample of respondents, while the open-ended questions allowed participants to elaborate on their responses in their own words, adding nuance and depth to the quantitative findings. Qualitative data were gathered through a focus group discussion at one of the participating sites and direct observations conducted at both sites, offering deeper insight into the institutional and behavioral factors that underlie the patterns identified through the survey.

Due to the confidentiality requirements of ToSMM project and the terms outlined in the data-sharing agreement, the identities of the participating organizations are not disclosed in this study. To ensure compliance with these requirements, all data, findings, and references to specific organizations are fully anonymized. Throughout this chapter, the two participating companies are therefore referred to as Site A and Site B.
While their identities remain undisclosed, the two sites differ meaningfully across several key dimensions, as summarized in the table below.

Table 9: Comparative overview of Site A and Site B

Characteristic	**Site B**	**Site A**
Organizational Scale	Large-scale mining operation	Medium-sized enterprise
Ownership Structure	State-owned	Privately owned
Metal Extracted	Different metal	Different metal
Workforce Size	Large workforce	Medium-sized workforce

These differences make the comparative analysis particularly valuable, as they allow findings to be examined across varied organizational contexts rather than within a single institutional setting.

4.2 Survey Design

The survey covers 31 Likert-scale questions across seven TSM protocols, a barriers question, an open-ended question, and a demographics section. Each question uses a five-point scale (1 = strongly disagree to 5 = strongly agree) with two additional options: "Don't know" and "Not relevant to my work." All questions measure broad awareness and understanding, not technical knowledge.

Table 10: Survey structure by protocols

Protocols	Questions	Count
Community Relationships	Q1 - Q6	6
Safe, Healthy and Respectful Workplaces	Q7 - Q11	5
Water Stewardship	Q12 - Q17	6
Tailings Management	Q18 - Q20	3
Climate Change	Q21 - Q23	3
Equitable, Diverse and Inclusive Workplaces	Q24 - Q28	4
Biodiversity Conservation	Q29 - Q31	3
Barriers (multiple choice)	Q32	1
Open-ended	Q33	1

Table 11: Demographic variables

Demographic Variable	Response Options
Department	Open text

Demographic Variable	Response Options
Gender	Male, Female, Other
Age	18-25, 26-35, 36-45, 46-55, 56+, Prefer not to say
Position level	Worker, Supervisor, Manager
Employment type	Permanent, Contract, Intern
Tenure at site	<6 months, <1 year, 1-5 years, 6-10 years, >10 years

Due to operational access constraints in mining environments, non-probability convenience sampling combined with voluntary participation was used. The survey was distributed to available workers across departments at both sites, and all responses were anonymous. This thesis focuses on the SHRW questions (Q7–Q11). The following section explains each question and what it measures.

4.2.1 SHRW Survey Questions (Q7-Q11)

The five SHRW questions were designed to capture different dimensions of workplace safety, psychological safety, and organizational culture. Because the six SHRW indicators are interconnected, each question relates to multiple indicators.

Table 12: SHRW survey questions and connected indicators

Question	What it asks (translated)	Connected Indicators
Q7	Worker safety, health, and respectful workplace are given importance in management decision-making	1 (Commitment and Accountability)
Q8	I clearly know where and how to report workplace risks and concerns	2 (Safety and Health Management Systems) 3 (Psychological

Question	What it asks (translated)	Connected Indicators
		Safety), 5 (Monitoring and Reporting)
Q9	Our organization provides conditions and opportunities to raise problems, mistakes, and learn from them	3 (Psychological Safety and Respectful Behavior)
Q10	Real decisions and improvements are made based on information received from workers	1, 2, 3, 4, 5 (all procedural and behavioral indicators)
Q11	Our organization provides training and development activities that match worker needs	4 (Training, Behavior and Culture)

The indicators function as a system, not as separate requirements. Leadership commitment (Q7) creates the conditions for safety systems (Q8) to work. Psychological safety (Q9) determines whether workers use those systems. Whether worker input leads to real change (Q10) connects to nearly every indicator because it reflects whether the entire system is functioning, not just whether it exists. Training (Q11) builds the knowledge base that supports all other indicators. This is why Q10 touches five of six indicators. It measures the outcome of the whole system working together.

4.2.2 Open-Ended Question Design

In addition to Likert-scale questions, an open-ended question was included to identify the key factors that create difficulty in implementing the SHRW requirements covered in all questions. Respondents were allowed to select multiple answers to reflect the multi-factor nature of implementation challenges. The response options were designed to capture common operational, organizational, and resource-related barriers, while an “Other” option was provided to allow respondents to specify additional factors not listed.

Table 13: Implementation barriers question

Question	Response Options
Which factors create the greatest difficulty for you in implementing the requirements described in Questions 1–31? (You may select multiple answers)	☐ Lack of time ☐ Lack of knowledge and skills ☐ Insufficient equipment and resources ☐ Unclear roles and responsibilities ☐ Lack of management support ☐ Other: _____

4.3 Focus Group Discussion and Observation Design

A two-day TSM training session was conducted at Site A. The first day covered TSM concepts and all seven protocols. On the second day, participants chose the protocol they wanted to discuss in depth based on their own interest. The SHRW focus group consisted of participants who selected this protocol. The session combined training on Indicator 3 with an open group discussion. This format served a dual purpose: it introduced the handbook content and captured participant responses as qualitative data.

Observations were collected throughout the entire project period at both Site A and Site B. These include how workers and managers respond to TSM concepts, where gaps in understanding appear, and what workplace conditions are relevant to SHRW implementation.

4.4 Data Analysis Approach

The analysis follows a principle: data does not speak by itself. Analysis gives it structure. Interpretation gives it meaning. The common mistake is jumping directly from raw data to conclusions. This study avoids that by following a structured process from raw data to handbook improvement.

Survey data suggests broad patterns across many respondents. Focus group data explains why those patterns exist. Observations verify whether what people report matches what actually happens in the workplace. Conclusions are drawn from the combination and comparison of all three sources.

Table 14: Data analysis stages

Stage	What happens	Example
Raw data	Collect unprocessed responses, notes, and records	Survey answer: Likert scale 1 to 5 on a specific question
Analysis	Structure raw data into patterns using statistics, coding, and grouping	60% scored 4 or 5, 25% scored 3, 15% scored 1 or 2
Interpretation	Determine what the patterns mean for SHRW implementation	Workers broadly agree but a significant minority does not, indicating uneven awareness
Handbook improvement	Translate findings into specific changes	Add clearer guidance on reporting mechanisms in Section 6 of the handbook

No single data source is used alone to draw conclusions. Each source serves a different purpose.

Table 15: Purpose of data collection method

Source	What it provides
Survey	Broad patterns across many respondents: awareness levels, perceptions, barriers
Focus group discussion	Why those patterns exist: real experiences, institutional dynamics, behavioral factors
Observation	Whether what people report matches what actually happens in practice

Conclusions are drawn from the combination and comparison of all three sources. If a survey indicates high scores on reporting awareness but the focus group reveals that workers do not trust the reporting system, both findings together tell a more complete story than either one alone.

4.4.1 Quantitative analysis

Survey responses are analyzed using descriptive statistics: frequencies, percentages, and mean scores per question and per protocol. Responses are compared between Site A and Site B. This comparison serves two purposes: it suggests whether SHRW outcomes change worker awareness and perceptions, and it establishes a pre-adoption baseline that the handbook must account for when guiding companies at the earliest stages of implementation.

Responses are also compared across demographic variables (position level, tenure, department) to identify whether awareness patterns differ by organizational level or experience. The barriers question (Q32) is analyzed by frequency count to rank perceived obstacles. Internal consistency of the survey instrument was assessed using Cronbach's alpha, with the SHRW scale recording good reliability at both sites (Site A: $\alpha = 0.898$; Site B: $\alpha = 0.864$). All other protocol scales exceeded $\alpha \geq 0.70$ except Community Relationships at Site B ($\alpha = 0.686$), attributed to high "Don't know" response rates. No inferential statistical tests were applied. All reported differences are descriptive and should be interpreted accordingly. Full reliability tables are provided in Appendix B. Analysis is conducted using Google Sheets, Excel, and Power BI.

The survey instrument was developed for exploratory applied research purposes and was not subjected to formal psychometric validation procedures such as factor analysis or construct validation.

4.4.2 Qualitative analysis

Focus group discussion notes and observation records were analyzed using inductive thematic analysis. This approach begins with the raw data itself rather than a predetermined framework, allowing themes to emerge organically from what participants said and what was observed, rather than being imposed from outside. In practice, this means the data was read in full first, recurring ideas and patterns were identified and assigned short descriptive labels called codes, and related codes were then grouped into broader themes based on their conceptual relevance to the research questions. The process was

iterative, meaning the data was revisited multiple times until the themes stabilized and no new meaningful patterns emerged.

No formal coding software was used. Theme identification was conducted manually, which is consistent with the exploratory nature of this study and appropriate for the scale of qualitative data collected. Direct participant statements from the focus group record were translated from Mongolian and retained as quotation evidence where analytically significant, providing grounding for the interpretations made.

The themes identified through this process were then mapped to specific SHRW indicators and handbook sections to determine where content needed to be added, revised, or strengthened. This connection between qualitative findings and handbook development is the primary analytical purpose of the qualitative strand within the broader mixed-methods design.

4.4.3 From findings to handbook improvement

Each finding is connected to a specific part of the handbook. If survey data indicates low awareness of reporting mechanisms, that finding points to the handbook's section on complaint and reporting systems. If focus group discussion reveals a barrier the handbook does not address, that gap is identified and new content is developed. The goal is not to describe conditions in Mongolian mining companies. The goal is to determine what the handbook must change based on those conditions.

Chapter 5: Results

5.1 Site A

5.1.1 Overview of Site A

Site A is a medium-sized, privately owned coal mining operation with a mid-sized workforce that has adopted the Towards Sustainable Mining (TSM) framework since 2023.

5.1.2 Survey Analysis

A total of 97 surveys were collected in paper format. With a 10 percent margin of error and an assumed response proportion of 0.5, the minimum sufficient sample size was calculated at 65. The 97 responses exceed this threshold, representing a sufficient sample relative to the total workforce of the site.

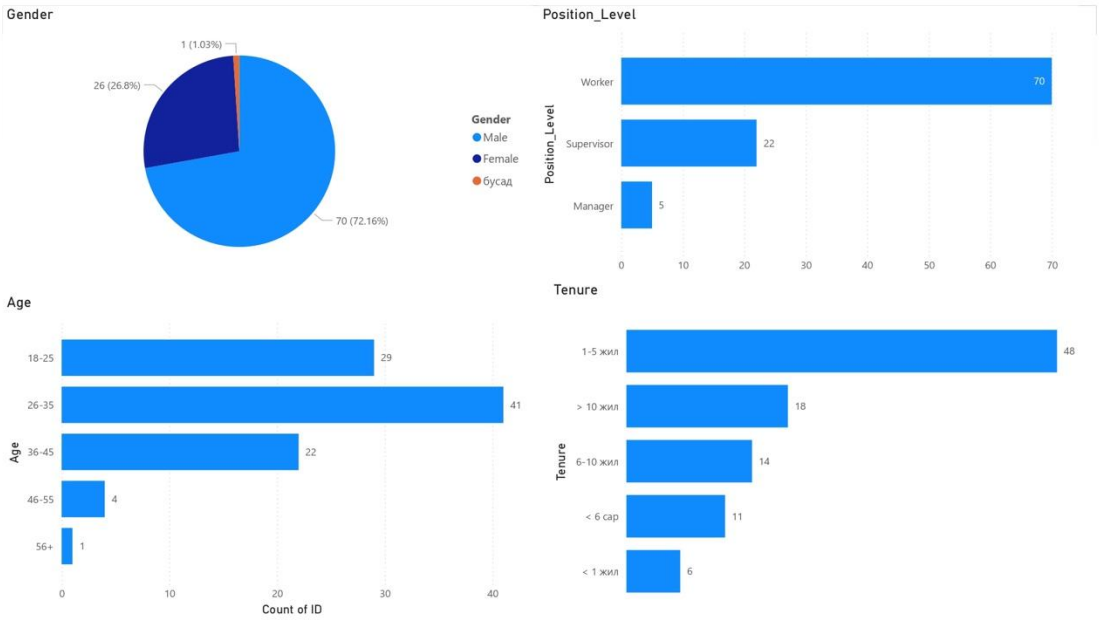

Figure 7: Site A survey demographics

The sample is predominantly male (72%), aged 18-35 (72%), working at the worker level (72.4%), in permanent employment (93.9%), with 1-5 years of tenure (50.0%). This reflects the typical workforce composition at a medium-sized mining operation.

5.1.3 Cross-Protocol Overview

Before examining SHRW results in detail, this section presents the broader awareness environment across all seven protocols. This provides context for interpreting SHRW scores.

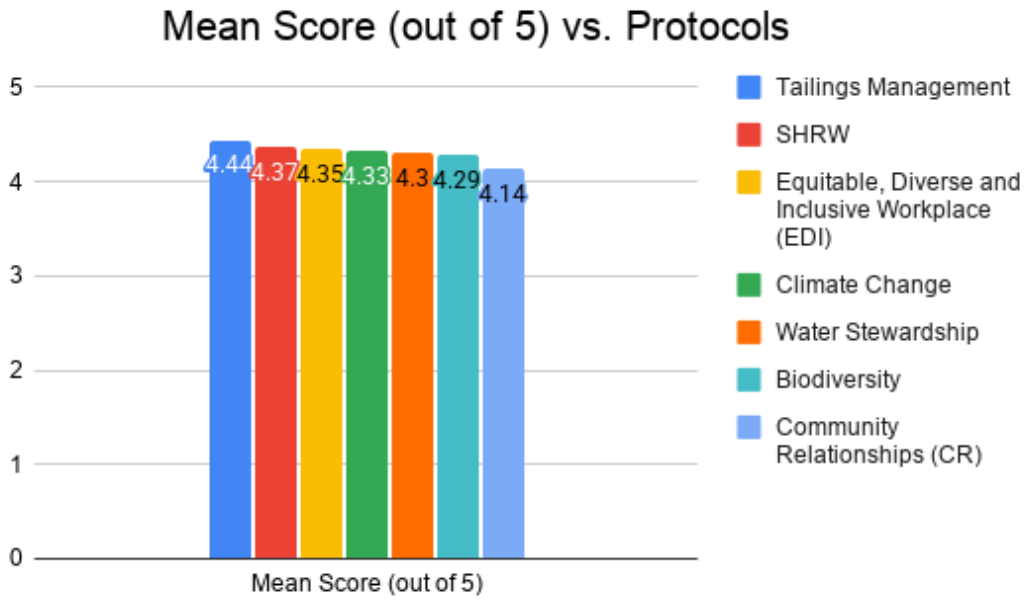

Figure 8: Mean protocol scores of Site A (n=97)

Overall scores across all protocols are high, ranging from 4.14 to 4.44, suggesting a generally positive workforce perception of TSM implementation at Site A. SHRW ranks second overall with a mean of 4.37, indicating that safety, health, and respectful workplace practices are among the more strongly perceived protocols at this site.

5.1.4 SHRW Survey Question Results

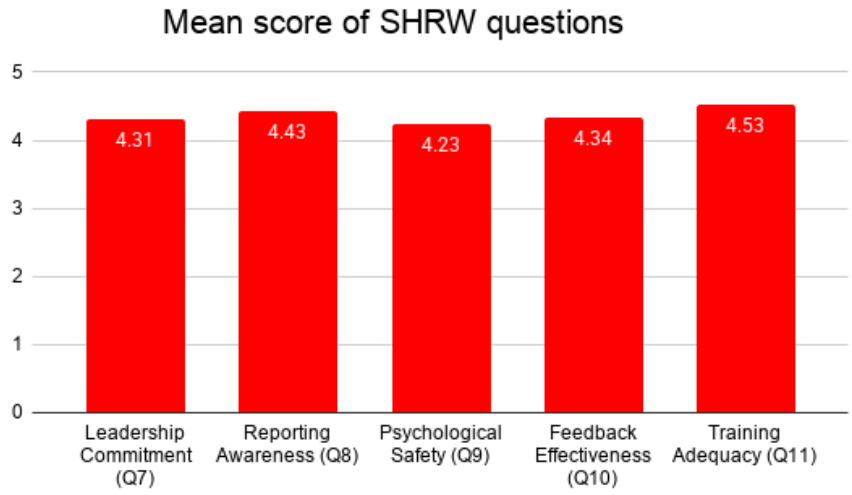

Figure 9: Mean score of SHRW questions

Finding 1: SHRW is broadly well-perceived across the workforce, with no awareness gaps

The overall SHRW protocol mean is 4.37, reflecting broadly positive perceptions of safety, health, and respectful workplace practices. The "Don't know" rate for SHRW is low at 6.4%, and no respondents marked any SHRW item as "Not relevant," indicating that workers across all departments consider these questions applicable to their work. This distinguishes SHRW from several other protocols and suggests it is well-embedded in site-wide awareness.

Finding 2: Training satisfaction is the strongest dimension of SHRW

Training satisfaction (Q11) is the highest-scoring item at 4.53, with nearly three-quarters of respondents (71.7%) awarding the maximum score of 5. This indicates high satisfaction with the relevance and quality of safety and health training, consistent with Site A's position as an early TSM implementer where structured training programmes are more established.

Finding 3: Psychological safety is the weakest dimension of SHRW

The weakest item is Q9, which measures whether conditions exist to raise problems and learn from mistakes, with a mean score of 4.24. Approximately 15.2% of respondents rated Q9 at 3 or below, representing the highest proportion of low scores within the protocol. This finding is theoretically significant. Workers demonstrate stronger awareness of formal reporting channels, as reflected in Q8 with a mean score of 4.43, than confidence in the environment that enables them to use those channels openly. Knowing where to report and feeling safe to do so are distinct conditions, and this gap is examined further in Chapter 6.

Finding 4: Managers score lower than workers on SHRW

The chart illustrates variation in SHRW scores across organizational levels. Managers recorded the lowest overall mean score (4.21), with the lowest values observed for Q9 (4.00) and Q10 (4.25). In comparison, workers and supervisors reported higher scores for the same items.

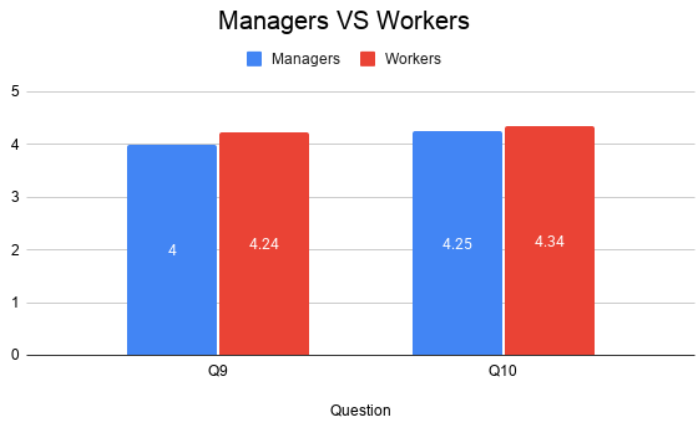

Figure 10: Manager VS Worker on Q9, Q10

Finding 5: Longer-tenured workers report stronger SHRW perceptions

The chart indicates a gradual increase in SHRW scores as employee tenure increases. This pattern suggests that greater familiarity with workplace systems and organizational culture may strengthen employee confidence in reporting mechanisms and system responsiveness over time. In contrast, newer employees may experience lower confidence due to limited exposure to internal procedures and communication channels. These findings highlight the importance of strengthening onboarding processes and early-tenure engagement during TSM implementation

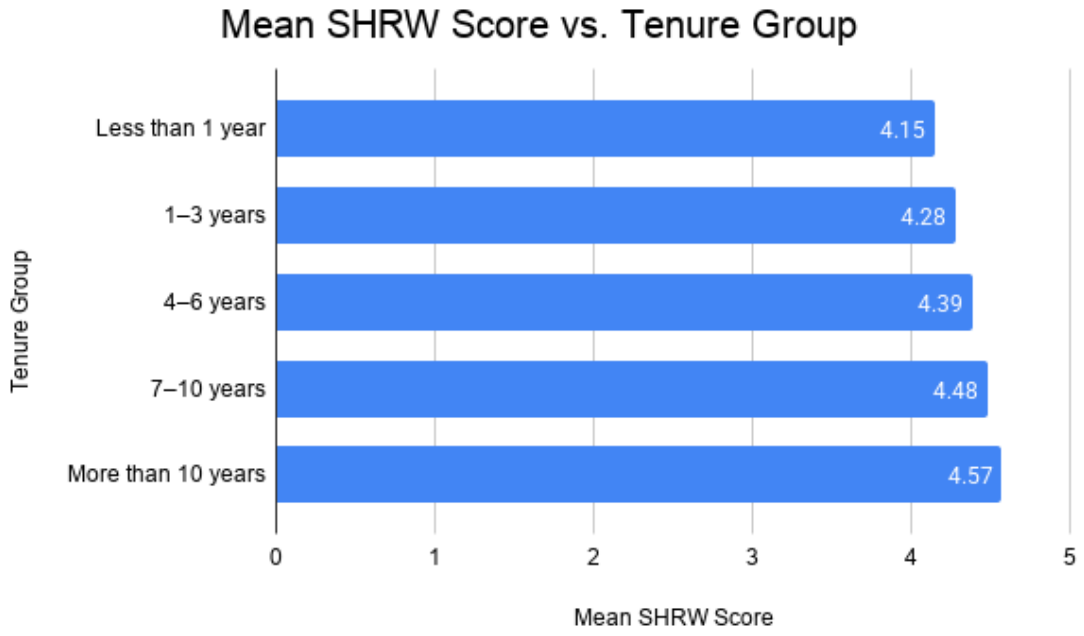

Figure 11: SHRW Scores by Employee Tenure

Finding 6: Female respondents report higher SHRW scores than male respondents

Female respondents score higher than male respondents across SHRW (4.50 vs. 4.33). Given the limited number of female respondents in the sample (n=27) and their concentration in administrative and supervisory roles, this difference should be interpreted cautiously. It likely reflects departmental composition rather than gender effects and is not treated as a primary finding of this study.

5.1.5 Open-Ended Question Analysis

With multiple responses allowed per participant, a total of 117 responses were recorded for the open-ended question. The most frequently selected barrier was lack of time, identified by 35 respondents, making it the most frequently reported constraint in implementing SHRW requirements.

This was followed by lack of knowledge and skills, which also recorded a relatively high number of responses. Insufficient equipment and resources and unclear roles and responsibilities were selected at similar levels, indicating comparable response frequencies for these factors. Lack of management support was reported less frequently compared to the other predefined options.

In addition, 12 respondents indicated that they do not experience significant barriers. A smaller number of responses were recorded under the “Other” category, where participants identified additional factors not included in the predefined options.

The responses indicate that implementation challenges are distributed across multiple factors, with time constraints being the most frequently selected.

5.1.6 Focus Group Discussion: Indicator 3 - Psychological Safety and Respectful Workplace

Overview and participant profile

A focus group discussion (FGD) was conducted on 5 April 2026 at Site A, lasting approximately five hours. The session was facilitated by Narangarav and documented by Uyanga-Erdene and the author. Nineteen workers participated: four had taken part in a prior TSM self-assessment, six had existing awareness of the TSM framework, and nine had no prior exposure. This mixed familiarity profile ensured that the findings reflected both institutionally informed and ground-level perspectives. The FGD was designed specifically to investigate Indicator 3 and to provide qualitative depth to the patterns identified in the survey.

FGD Finding 1: The boundary between enforcement and harassment is unclear

Supervisors reported hesitating to enforce operational standards, including safety procedures, due to concern that workers may interpret such enforcement as harassment. One participant described the situation directly:

"In recent years, masters have become hesitant to give full work instructions out of fear that workers may file complaints. If a master sets a work requirement and the worker reports it as harassment, the person who gave the instruction becomes the problem."

This concern extended beyond individual discomfort. Participants noted that when enforcement hesitation becomes widespread, accountability systems weaken and safety risks increase. As one participant stated:

"If we correct workers too directly, they may interpret it as harassment. But if we say nothing, the behavior continues."

Participants indicated that the distinction between legitimate work requirements and reportable conduct is not clearly understood in practice. Survey results for Q9 (conditions to raise problems) showed that managers recorded lower scores than workers, consistent with this finding.

FGD Finding 2: Overestimation of SHRW Self-Assessment Scores

Participants who had been involved in conducting the TSM self-assessment acknowledged during the session that their previously submitted scores had been overestimated. One participant explained:

"When we first did the assessment, our understanding was limited, so we likely scored ourselves too high. Now we cannot lower the score even when we want to."

At the time of the original self-assessment, the structure of the SHRW protocol, including Indicator 3 specifically, had not yet been fully introduced to the team. Following a detailed discussion of the framework during the session, participants conducted their first structured assessment of Indicator 3 using the handbook developed in this study and assessed the organization's performance at Level B. Participants reflected that earlier scoring had been based primarily on the presence of documented systems, whereas the handbook-guided assessment required evaluation of actual day-to-day workplace practices.

FGD Finding 3: Indicator 3 is perceived as abstract and contextually distant

Participants reported that Indicator 3 feels abstract and difficult to relate to their actual working conditions. One participant stated:

"Indicator 3 has not yet entered the company's daily operations. It still feels abstract. We would like to receive further training once a psychologist is formally appointed."

Participants noted that concepts such as psychological safety have no direct equivalent in Mongolian mining vocabulary and that the examples used in the framework do not reflect their operational context, including their specific job roles, hazard exposure, and supervisory practices. One participant added:

"The examples in the handbook come from a different context. It is not always clear how they apply to what we actually do here."

FGD Finding 4: Reporting channels do not protect the identity of those who report

A formal reporting mechanism exists at Site A, but concerns about confidentiality undermine its practical use. Workers described situations where submitting a concern resulted in their identity becoming known to colleagues and supervisors, leading to reputational consequences. One participant described the experience directly:

"The current reporting channels are not sufficient. Trust is low. If you report something, people find out it was you."

The gap between the formal existence of a reporting system and workers' willingness to use it was a recurring theme throughout the discussion. Even when workers were aware of the channel, the perceived risk of identification made it functionally inaccessible. Survey results for Q10 showed the lowest feedback-related score within the SHRW protocol and the highest "Don't know" response rate at 7.4%, consistent with this finding.

FGD Finding 5: Workers receive no information about what happens after they report

Beyond the risk of identification, a second barrier to reporting emerged: the complete absence of follow-up communication. Once a concern is submitted, nothing is heard back. No confirmation, no update, and no visible outcome. This silence makes the reporting system feel ineffective, regardless of whether concerns are actually being addressed behind the scenes. One participant captured this directly:

"There must be a feedback loop. How many issues were resolved, what responses were given — these need to be communicated openly."

Survey results for Q10 indicated low scores related to feedback on reported concerns, reinforcing this finding quantitatively and confirming that the absence of follow-up is not an isolated perception but a pattern across respondents.

5.1.7 Observation Analysis

Observations conducted at Site A provided additional qualitative insights to complement the survey and focus group findings. During the site visit, staff and workers were welcoming and cooperative, allowing access to operational areas and permitting documentation, including photographs.

During the focus group discussion, participation levels were high, with most participants actively contributing to the discussion. Participants engaged openly, shared their perspectives, and discussed workplace practices. Several participants acknowledged challenges and described situations involving mistakes and operational issues.

The discussion was dynamic, with active exchanges among participants. At times, the discussion became heated, reflecting differing viewpoints and strong engagement with the topics being discussed.

In terms of workforce characteristics, a large proportion of employees appeared to be relatively young, including individuals in both operational and engineering roles. Senior engineers were also observed to be relatively young.

5.2 Site B

5.2.1 Site B Overview

Site B is a large-scale, state-owned copper and molybdenum mining operation with a sizable workforce. As a state-owned enterprise, it operates within a public accountability framework that shapes how policies and sustainability initiatives are adopted and implemented across the site. In preparation for adopting the Towards Sustainable Mining (TSM) framework, Site B has established a dedicated working group tasked with guiding the organization through the TSM adoption process.

5.2.2 Survey Analysis

Following the Site A survey analysis, the project team refined several survey questions to improve clarity and contextual relevance before conducting the Site B survey. Two questions were removed due to overlap and limited analytical value. However, the original numbering was intentionally retained to maintain consistency across datasets and simplify comparative data analysis and cross-referencing.

A total of 302 responses were collected from Site B. The respondent profile indicates that frontline workers constituted the majority of participants, with 208 respondents (68.87%). Management-level respondents, including managers and supervisors, accounted for 54 respondents (17.88%), while the remaining respondents were categorized as unidentified.

In terms of gender distribution, 193 respondents (63.91%) were male and 88 respondents (29.14%) were female, with a small proportion selecting other or not disclosing their gender.

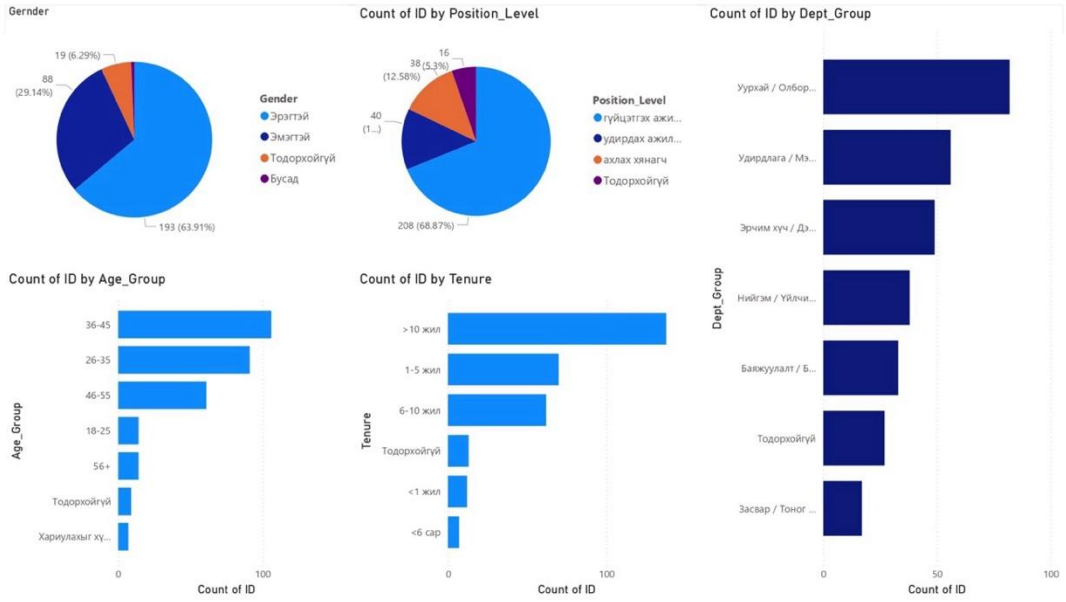

Figure 12: Site B survey demographics

Regarding tenure, a significant portion of respondents had more than 10 years of work experience, indicating that the sample includes a high proportion of experienced employees.

In addition, 27 respondents (8.94%) did not provide their job position or identifying information and were categorized as “unidentified” in the analysis.

5.2.3 Cross-Protocol Overview

Across all protocols, differences were observed between respondents who provided identifying information and those who did not. The average scores reported by identified respondents were consistently higher than those reported by unidentified respondents.

For the Safe, Healthy, and Respectful Workplace (SHRW) protocol, identified respondents recorded an average score of 3.90, while unidentified respondents recorded 3.40. Similar differences were observed across other protocols, including Community Relationships (CR), Environment and Biodiversity (Bio), Climate Change (Climate), Waste Management (Waste), and Water Stewardship (Water), where unidentified respondents reported lower average scores.

The largest difference was observed in the Equity, Diversity, and Inclusion (EDI) protocol, where identified respondents recorded an average score of 4.02 compared to 3.31 among unidentified respondents. Overall, the results show a consistent pattern of lower scores among unidentified respondents across all protocols.

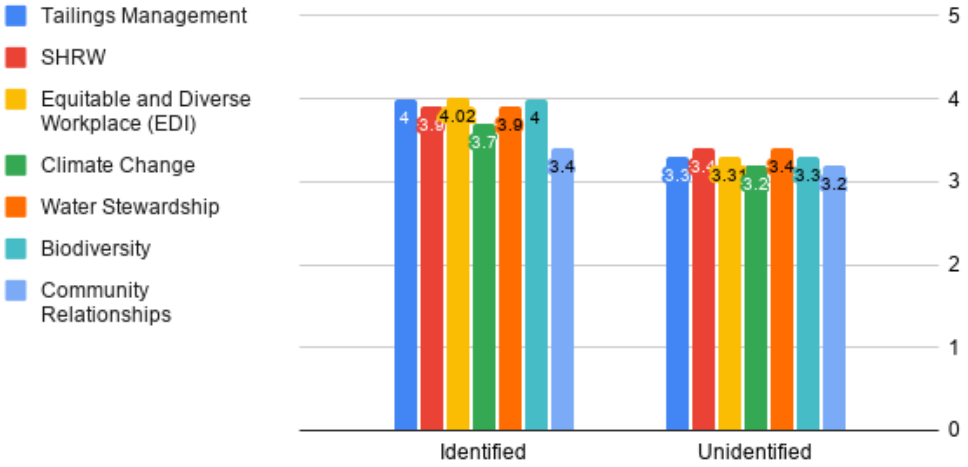

Figure 13: Comparison of mean protocol score by identified and unidentified respondents (Site B)

5.2.4 SHRW Survey Question Results

Finding 1: Safety Systems Exist, But Worker Voice Does Not Drive Change

As shown in the chart, workers recognize that a safety system exists (Q8, mean 4.12), but do not believe their input actually changes anything within it (Q10, mean 3.69). This 0.43-point gap suggests that safety structures are in place on paper, but worker participation within them remains limited in practice.

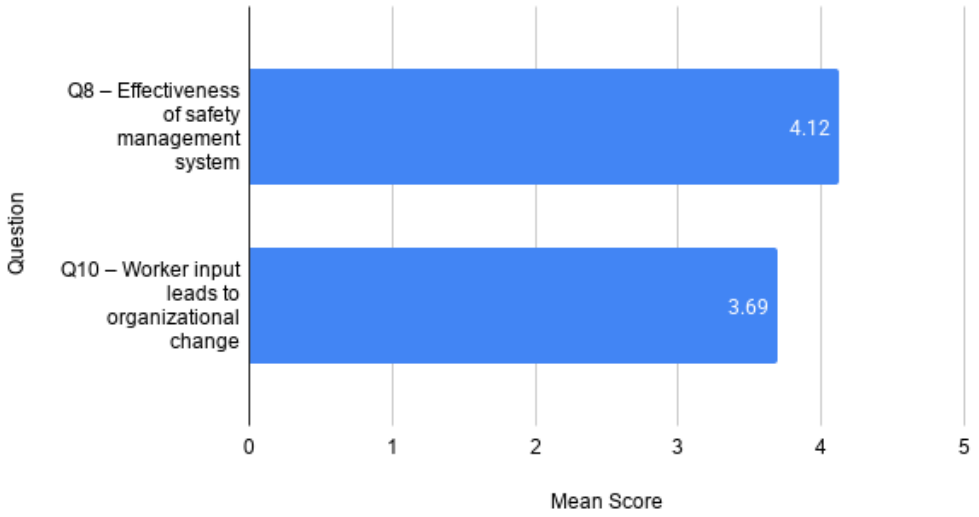

Figure 14: Comparison of Mean scores between Q8 and Q10

Finding 2: Divergence in Perceptions of Worker Participation Across Organizational Levels

The chart illustrates differences in perceptions of employee influence across organizational levels. Management respondents reported a higher mean score for Q10 (4.18), while front-line workers reported a lower mean score (3.56). The results show a 0.62-point difference between the two groups regarding whether worker input contributes to organizational improvement.

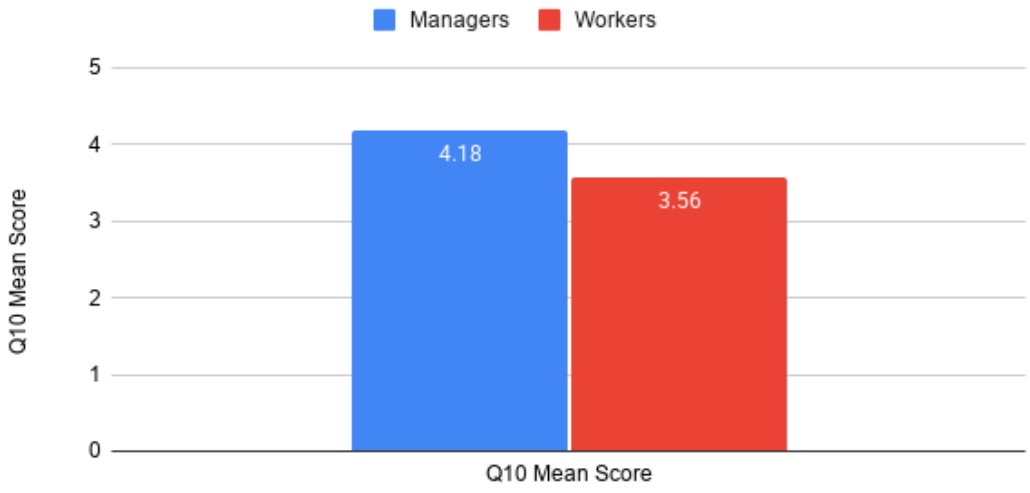

Figure 15: Comparison of Q10 Mean scores by organizational level

Finding 3: The Psychological Safety and Leadership Intent Alignment

Q7, which measures leadership commitment, recorded a mean score of 3.95, while Q9, which measures psychological safety, recorded a lower mean score of 3.75. The results show a 0.20-point difference between perceptions of management commitment and employees' sense of safety in speaking up or reporting concerns. Given the absence of inferential testing, small differences in mean scores should be interpreted as directional patterns rather than statistically confirmed effects.

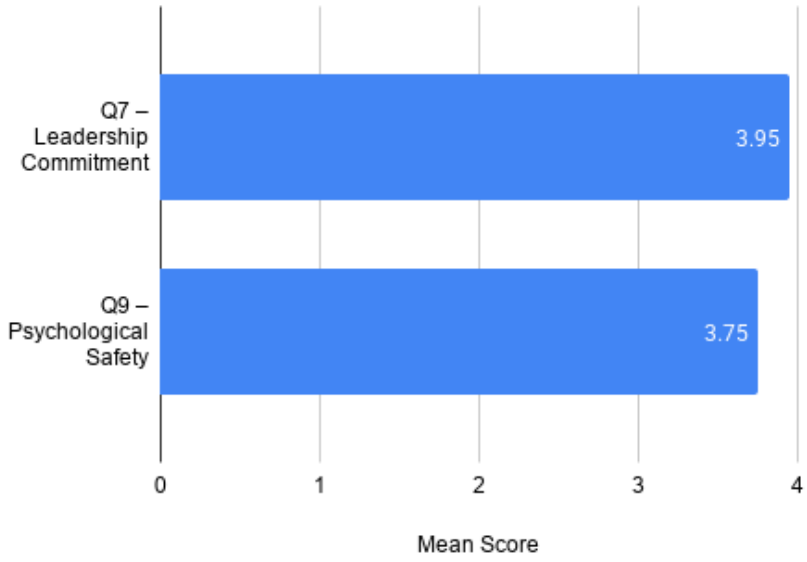

Figure 16: Differences between leadership commitment and psychological safety perceptions

Finding 4: Training Efficacy Across Employee Tenure

Perceptions of Training and Development (Q11) decrease as employee tenure increases. Employees with 1–5 years of service reported the highest mean score (3.98), while employees with more than 10 years of experience reported the lowest score (3.74). The results show that newer employees viewed training activities more positively than long-term employees.

5.2.5 Open-Ended / Multiple-Response Question Analysis

Analysis of open-ended responses at Site B indicate that the most frequently identified barriers were lack of management support and unclear roles and responsibilities. Respondents described communication in their workplace as top-down and directive, with limited space for workers to raise concerns or suggest changes. This pattern suggests that the main obstacle to SHRW implementation at Site B is not a lack of resources or technical knowledge, but a workplace culture where upward communication is discouraged. Transitioning to a respectful workplace as required by Indicator 3 will require

changes to communication practices and leadership behavior, not only the introduction of new systems or policies.

5.2.6 Observation analysis

Observations conducted at Site B throughout the project period served as the primary qualitative data source for that site, capturing worker and management responses to TSM concepts, visible gaps in understanding, and relevant workplace conditions. While a formal focus group was not conducted at Site B, the structured observations collected across multiple points of contact provided meaningful qualitative insight into the organizational dynamics shaping SHRW implementation at the site.

Several patterns emerged consistently during the site visit. A relatively high number of survey respondents chose not to identify themselves, a behavior that was directly observed during data collection rather than inferred from the data alone. This pattern was not isolated to a single department or moment but was observable across the site visit as a whole.

The overall atmosphere during the survey process appeared controlled and formal. Workers were visibly reluctant to complete the survey in open or shared spaces such as hallways or common areas, and consistently preferred to respond in their own offices or enclosed rooms. This spatial behavior was itself an observable signal: the preference for private space during an anonymous survey suggests that workers perceived even the physical act of responding as carrying some degree of personal risk.

Access to workers required prior organizational approval, and a designated representative accompanied the data collection team throughout the entire site visit. The consistent presence of supervision during survey distribution created conditions in which workers may not have felt fully free to respond candidly, regardless of the survey's stated anonymity. This dynamic was observed rather than reported by workers, making it a direct qualitative finding rather than a perception.

Taken together, these observations point to a workplace environment where psychological safety remains limited in practice. Workers' spatial choices, reluctance to self-identify, and behavior under supervisory presence collectively reflect the core challenge of Indicator 3: that formal structures alone do not produce the conditions under which workers feel safe to speak, report, or participate openly.

Chapter 6: Discussion

6.1 Framing the discussion

This chapter discusses the findings from Chapter 5 in relation to the main research question: how the TSM SHRW implementation handbook can be structured and adapted for Mongolian mining companies, particularly for Indicator 3 (Psychological Safety and Respectful Behavior). While Chapter 5 presented the results of the survey, focus group discussion, and observation, this chapter explains what those findings mean for SHRW implementation and handbook development.

The discussion is organized around five major themes identified from the combined analysis of data from both sites. The findings are interpreted using the theoretical frameworks presented in Chapter 3 and the literature reviewed in Chapter 2.

The findings are grouped into two categories. The first group includes findings that validate the need for the handbook and confirm the existence of the identified implementation challenges. The second group includes findings that contributed to improving and expanding the handbook content based on practical workplace evidence.

6.2 Findings That Validate the Handbook

Finding 1: The Distance Between System Existence and System Function

A consistent finding across both sites is the gap between the formal existence of reporting systems and how those systems function in practice. At Site A, Q8 (reporting awareness) scored 4.43, while Q9 (psychological safety) scored lower at 4.24. This indicates that workers are aware of the reporting system but are less confident about using it openly. At Site B, a similar pattern was observed. Q8 recorded the highest score in the protocol (4.12), while Q10 (feedback effectiveness) recorded the lowest (3.69), indicating lower confidence that worker input leads to meaningful action.

Together, these findings show weaknesses at different stages of the reporting process. At Site A, concerns were related to speaking up safely, while at Site B, concerns were related to whether reporting produces visible outcomes. The results support Meyer and Rowan's (6) concept of decoupling, where formal systems exist but are not fully reflected

in day-to-day practice. These findings validate the central purpose of the handbook: addressing the gap between having formal SHRW systems and ensuring those systems are trusted and effectively used in practice.

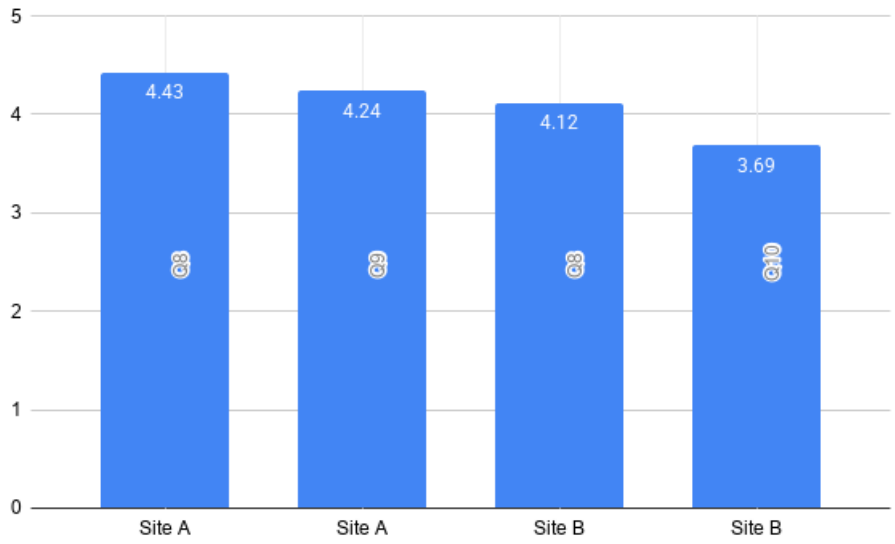

Figure 17: The gap between system existence and system function of Site A and B

Finding 2: The Enforcement-Harassment Paradox

The focus group discussion at Site A revealed an issue that was not clearly visible in the survey results. Supervisors reported hesitating to enforce operational and safety rules because some workers responded by filing harassment complaints. In some cases, the complaint system was perceived as being used to avoid legitimate correction or enforcement.

This finding helps explain why managers recorded the lowest SHRW scores, including lower scores for Q9 (4.00) and Q10 (4.25). The findings show tension between maintaining psychological safety and enforcing workplace safety requirements.

The results also identified a gap in the SHRW protocol. While the protocol requires reporting mechanisms, it does not clearly explain the difference between legitimate enforcement and harassment. Existing psychological safety frameworks, including Edmondson and Clark (11), provide limited guidance for high-risk industrial workplaces where safety instructions must be strictly enforced.

Finding 3: The Verification-Practice Gap

Focus group participants explained that previous TSM self-assessments at the company were conducted before Indicator 3 became a formal requirement and before any formal TSM training had been provided in Mongolia. As one of the first companies in Mongolia to implement the TSM framework, participants stated that earlier assessments were completed with limited guidance and without a structured understanding of psychological safety and respectful workplace practices. Participants also noted that once a high maturity score is reported, organizations may find it difficult to later report a lower level, even when workplace conditions may not fully support the earlier rating.

During the focus group, participants completed their first dedicated Indicator 3 self-assessment using the handbook developed in this study. Through group discussion and evidence-based evaluation, participants collectively identified their organization at Level B, reflecting a more grounded and realistic assessment of current practice.

This finding suggests that organizations may unintentionally overestimate maturity levels when assessments rely mainly on documented systems rather than observed workplace practice. The findings support Meyer and Rowan's (6) concept of decoupling, where formal systems may not fully reflect day-to-day organizational reality.

The results also indicate that the handbook functions as a practical calibration tool by supporting more structured, evidence-based, and context-aware self-assessment. This finding validated the handbook's staged approach, which emphasizes awareness before implementation and implementation before institutionalization.

Based on this finding, a guiding TSM philosophy statement was added to the beginning of each protocol section to emphasize honest self-assessment, realistic positioning, and continuous improvement rather than rapid advancement through maturity levels.

Finding 4: Contextual Distance and Cultural Translation

Focus group participants reported that Indicator 3 felt abstract and difficult to connect to their daily work, workplace risks, and supervisory relationships. According to Rogers' (2003) Diffusion of Innovation (DOI) framework, implementation becomes difficult when new concepts do not align with existing workplace practices and understanding. Participants indicated that concepts such as psychological safety were not easily understood within the context of a hierarchical and shift-based mining environment.

The DOI framework also identifies complexity as a barrier to adoption. This was reflected in the 5.2% "Don't know" response rate for Q9, suggesting that some workers were unsure how psychological safety applied to their own work situation. At the same time, the

very low “Not relevant” response rate showed that workers considered the topic relevant, even if it was not fully understood.

This finding validated the handbook’s use of plain language, local workplace examples, and phased implementation design. In response to this finding, additional examples were added to the handbook showing how key performance indicators can be connected to Indicator 3 and translated into observable workplace practices.

Finding 5: The Reporting Cycle and Its Two Failures

Focus group findings 4 and 5 identified two problems within the reporting process: whether workers can report concerns safely and whether reporting leads to visible action. At Site A, workers reported concerns related to both confidentiality and feedback after reporting.

Participants explained that when a worker’s identity becomes known after submitting a concern, confidence in the reporting system decreases. In addition, workers reported uncertainty about whether submitted concerns lead to meaningful action. This was reflected in Q10, which recorded the lowest mean score (4.25) and the highest “Don’t know” response rate (7.4%). The findings suggest that workers often do not see clear evidence that reporting produces organizational change.

According to Organizational Change Theory, new behaviors become sustainable when they are consistently reinforced through visible outcomes and routine practice. The findings suggest that this stage has not yet been fully achieved within the reporting process.

This finding validated the handbook’s reporting mechanism guidance. In response, additional confidentiality guidance was added to the handbook to ensure that investigation procedures reduce the possibility of identifying reporters through the nature of complaints or management responses. A mandatory feedback requirement was also added, requiring that workers receive responses within a defined timeframe and confirmation when action has been taken.

6.2.1 From findings to handbook: A Summary of Empirically Grounded Improvements

The five findings discussed above produced two types of empirical contributions to the handbook. The first is validation: several findings confirmed that the handbook's existing structure, sequence, and design principles — established through theoretical analysis in Chapter 3 — were appropriate for the conditions found at Mongolian mining companies. The second is specification: the same findings revealed gaps, barriers, and operational

realities that the theoretical design could not have anticipated, requiring targeted additions to the handbook's content. The following two tables present each contribution separately.

Table 16: Empirical validation of existing handbook design

Finding	What It Revealed	Handbook Concept Validated	Supporting Evidence
1. The Distance Between System Existence and System Function	Formal systems exist at both sites but workers lack confidence in using them or doubt they produce outcomes	The central purpose of the handbook: bridging the gap between having SHRW systems and ensuring those systems function in practice	Q8 scored highest at both sites (4.43 / 4.12) while Q9 (4.24) and Q10 (3.69) scored lower, confirming the existence–function gap
2. The Enforcement–Harassment Paradox	Supervisors hesitate to enforce safety rules because workers respond with harassment complaints	The handbook's recognition that Indicator 3 requires guidance beyond what the protocol prescribes, justifying the seven-step implementation pathway (Table 8)	Managers recorded the lowest SHRW scores (Q9: 4.00, Q10: 4.25); focus group confirmed enforcement hesitation
3. The Verification–Practice Gap	Previous self-assessments scored based on documented systems rather than observed workplace practice	The handbook's staged approach: awareness before implementation, implementation before institutionalization (OC theory, Lewin's model)	Focus group participants conducted a structured Indicator 3 self-assessment using the handbook and collectively identified Level B — a more realistic rating than previously reported
4. Contextual Distance and Cultural Translation	Indicator 3 felt abstract and disconnected from daily mining work in a hierarchical, shift-based environment	The handbook's use of plain language, local workplace examples, and phased implementation design (DOI compatibility and complexity principles)	5.2% "Don't know" rate on Q9 confirmed conceptual difficulty; very low "Not relevant" rate confirmed workers saw the topic as important but not yet understood

5. The Reporting Cycle and Its Two Failures	Two breakdowns in reporting: confidentiality failures that expose reporters, and absence of feedback after reporting	The handbook's existing reporting mechanism guidance within the Indicator 3 implementation pathway (Steps 2 and 3, Table 8)	Q10 recorded the lowest mean (4.25) and the highest "Don't know" rate (7.4%); focus group confirmed both identity exposure and feedback absence

Table 17: Empirically grounded handbook additions

Finding	Interpretation	Handbook Addition
2. The Enforcement–Harassment Paradox	Complaint mechanisms were being used to resist legitimate enforcement of work requirements	Inclusion of a decision framework in Indicator 3 guidance to distinguish between legitimate work requirements and harassment
3. The Verification–Practice Gap	Scoring was based on the presence of documented systems rather than observed workplace practice	(1) Behavioral evidence checklist for Indicator 3 self-assessment; (2) Recommendation to include frontline workers in assessment teams; (3) TSM philosophy statement emphasizing honest self-assessment added to each protocol section
4. Contextual Distance and Cultural Translation	Low compatibility between protocol language and the Mongolian mining context	Inclusion of context-specific Mongolian mining scenarios and additional examples showing how KPIs can be connected to Indicator 3 and translated into observable workplace practices
5. The Reporting Cycle and Its Two Failures	Workers could not use reporting systems without personal risk, and could not observe whether reporting led to meaningful outcomes	(1) Operational confidentiality protocols separating reporting channels from handling procedures; (2) Mandatory feedback requirement with defined timeframes and confirmation of action taken

These findings collectively address the four sub questions of this thesis. The handbook's foundational structure established in Chapter 3 remained valid, as the theoretical analysis confirmed the need for sequenced implementation, awareness first design, and resource appropriate guidance (Table 16). The empirical findings contributed additional specificity by identifying the practical content needed to address the actual conditions,

barriers, and gaps observed in Mongolian mining operations (Table 17). In this sense, the theoretical analysis provided the overall structure of the handbook, while the field-work informed its practical content and implementation guidance.

6.3 What the Site A and Site B comparison reveals

The comparison between both sites provides a useful empirical reference point for understanding how TSM exposure may relate to SHRW outcomes. Site A recorded an overall SHRW mean of 4.37. Site B recorded 3.90 for identified respondents and 3.40 for unidentified respondents. While this pattern is broadly consistent with the idea that TSM implementation may support stronger SHRW outcomes, the comparison should be treated carefully. The two sites differ across multiple dimensions including size, ownership structure, geographic location, and resource sector, and any or all of these factors may also contribute to the observed differences. Comparisons between Site A and Site B should therefore be interpreted as exploratory rather than causal.

What the comparison does reveal more clearly is the behavioral pattern observed during the Site B survey process itself. Workers preferred private spaces over shared ones, a supervisor accompanied the data collection team throughout the visit, and a substantial number chose not to identify themselves. Unidentified respondents scored consistently lower across all protocols, with the largest gap in EDI (4.02 vs. 3.31). These behavioral patterns are worth noting not as data quality problems, but as contextual signals that may reflect the organizational environment at the time of data collection. The gap between identified and unidentified respondents may suggest that some workers felt more comfortable expressing candid views in private, which is itself relevant to the themes of psychological safety this study examines.

At Site A, none of these conditions were observed. Workers completed surveys openly, the focus group was dynamic, and participants spoke critically about management systems and their own prior assessments. This difference is notable, though it cannot be attributed to any single factor with confidence. The Resource-Based View frames organizational culture as an intangible resource, and the relative openness observed at Site A may reflect a difference in that resource rather than TSM exposure alone. The handbook cannot create this capability directly, but it can provide structured steps that support its development over time.

However, the comparison also reveals the limits of TSM exposure. Despite completing a full verification cycle, nine of nineteen focus group participants at Site A had no prior

awareness of TSM, and the 6.4% "Don't know" rate across SHRW questions confirms that formal adoption has not produced universal comprehension. This suggests an awareness ceiling: TSM exposure may improve organizational conditions relative to pre-adoption, but it does not guarantee operational understanding of all protocol requirements, particularly Indicator 3. The handbook must therefore be designed not only for companies beginning their TSM journey, but also for those that have formally adopted the framework yet still carry internal gaps in awareness and practice.

Chapter 7: Conclusion

7.1 Answering the Research Question

The central research question of this thesis is: *How can the TSM SHRW implementation handbook be structured and adapted to bridge the gap between protocol requirements and the organizational realities of Mongolian mining companies?* The answer was built in four stages, each guided by a sub-question.

Sub-question 1: How should the handbook be structured?

The handbook has seven sections (Section 3.2.4, Table 7): Introduction and Context, Objectives, Roles and Responsibilities, Implementation Plan, Resources and Support, Monitoring and Improvement, and Conclusion and Reinforcement. Three theories shaped this structure. Organizational Change theory set the sequence: awareness first, action second, institutionalization third. Diffusion of Innovation shaped what each section contains: early sections build understanding, later sections build practice. The Resource-Based View acted as a filter, ensuring every recommendation is realistic for a Mongolian mining company. Findings 3 and 4 validated this design by confirming that awareness must come before implementation and that abstract guidance fails without local context.

Sub-question 2: What implementation guidance should each indicator contain, particularly Indicator 3?

For Indicators 1, 2, 4, 5, and 6, the combination of theory, ISO 45001, and TSM protocol requirements produced sufficient guidance, since these indicators build on systems most Mongolian companies already have. Indicator 3 was different. It focuses on psychological safety and respectful behavior - concepts with no existing implementation model, no ISO equivalent, and no established local practice in Mongolia. A seven-step pathway was developed for this indicator (Section 3.3, Table 8), mapping each step to a target maturity level and the documents needed to demonstrate compliance.

Sub-question 3: What data should be collected, and what do the findings reveal?
Data was collected at two companies using three methods: a Likert-scale survey (399 respondents), a focus group (19 participants at Site A), and observations at both sites. Five findings emerged. First, reporting systems exist but workers do not trust them or see results from using them. Second, supervisors avoid enforcing safety rules because workers respond with harassment complaints - a boundary the protocol does not define. Third, self-assessment scores overestimate actual practice when based on documents rather than observed behavior. Fourth, Indicator 3 feels abstract and disconnected from daily mining work. Fifth, reporting fails at two points: confidentiality is not protected and no feedback is given after reporting. The site comparison also showed that formal TSM adoption does not guarantee understanding — nine of nineteen focus group participants at Site A had never heard of TSM.

Sub-question 4: What improvements should be made based on the findings?
The findings contributed in two ways. First, all five findings validated the handbook's existing structure and sequenced design (Table 16), confirming that the theoretical framework was appropriate for Mongolian mining conditions. Second, four findings produced targeted additions to the handbook's content (Table 17): Finding 2 contributed a decision framework to distinguish legitimate work requirements from harassment; Finding 3 contributed a behavioral evidence checklist, frontline worker inclusion in assessment teams, and a TSM philosophy statement emphasizing honest self-assessment; Finding 4 contributed context-specific Mongolian mining scenarios and KPI examples linking abstract concepts to observable workplace practices; and Finding 5 contributed operational confidentiality protocols separating reporting channels from handling procedures, paired with a mandatory feedback requirement with defined timeframes and confirmation of action taken.

7.1.1 Synthesized Answer

Together, the four sub-questions produce five components that define what the handbook must contain.

First, the structure must follow how organizations actually change: awareness before action, action before institutionalization. The empirical data confirmed this — companies that skip the awareness stage produce inflated scores disconnected from practice.

Second, Indicator 3 must be made concrete. Psychological safety cannot remain an abstract Western concept. The handbook translates it into Mongolian mining scenarios, observable KPIs, and language tied to daily supervisory relationships.

Third, the handbook must define boundaries the protocol leaves open. Without a clear framework distinguishing enforcement from harassment, complaint systems get misused and supervisors stop enforcing safety rules.

Fourth, reporting systems must work in practice, not just exist on paper. Two mechanisms are needed together: confidentiality protocols that protect the reporter, and mandatory feedback demonstrates to workers that reports lead to action.

Fifth, guidance must match the company's actual stage, not its reported score. Pre-adoption companies need Level B foundations first. Companies that have formally adopted TSM but still carry awareness gaps need recalibration tools — behavioral checklists and frontline involvement in self-assessment — to close the gap between systems on paper and conditions on the ground.

These five components are what practical SHRW implementation guidance looks like for Mongolian mining companies — each built from field evidence interpreted against established theory.

7.2 Key Contributions of the Study

This study makes five distinct contributions to the knowledge base on TSM implementation, to the understanding of psychological safety in non-Western industrial settings, and to practice through a concrete, evidence-based handbook.

First empirical study of TSM SHRW in Mongolia: Prior to this study, no published research had examined how the SHRW protocol should be implemented in Mongolian mining. The only directly relevant prior work, Chuluunbaatar E and Ganbaatar O (10), examined general TSM adoption barriers without investigating individual protocol dimensions. This study addresses that gap by providing a baseline of worker perceptions, institutional dynamics, and implementation barriers specific to the Mongolian mining context.

Identification of the enforcement-harassment paradox: The most original finding of this study is that supervisors avoid enforcing legitimate safety standards because workers

use complaint mechanisms in response, and that these mechanisms, designed to protect psychological safety, thereby undermine physical safety. This dynamic does not appear in existing literature. Edmondson (11) and Clark (12), whose frameworks underpin Indicator 3, treat speaking up as inherently positive and do not address the possibility that the infrastructure of psychological safety can be used to resist enforcement.

Evidence that TSM exposure does not equal TSM understanding: Site A completed a full TSM verification cycle, yet nine of nineteen focus group participants had never heard of TSM, and those who had conducted self-assessments acknowledged scoring too high. Formal adoption and multi-year implementation do not automatically produce organization-wide comprehension. Self-assessment reliability depends on the conceptual grounding of those conducting it.

Survey behavior as a proxy measure of psychological safety: At Site B, workers avoided completing surveys in shared spaces and scored lower when anonymous than when identified, a gap of up to 0.71 points in some protocols. This was not a data collection problem. It was a signal of ambient organizational trust, demonstrating that how workers behave during a survey on psychological safety is itself evidence of the construct being measured.

A practical implementation handbook: The handbook produced in Chapter 3 and refined through Chapters 5 and 6 is the primary practical output of this study. It is the first structured, step-by-step implementation resource for the TSM SHRW protocol adapted to Mongolian mining conditions, drawing on three theoretical frameworks, ISO 45001 standards, TSM protocol requirements, and field data from 399 survey respondents, nineteen focus group participants, and two organizational observation processes.

7.3 Practical Recommendations

Based on the findings of this study, three sets of practical recommendations are offered.

For Mongolian mining companies implementing TSM, Indicator 3 implementation should not begin by targeting Level A or higher maturity levels. The findings show that even companies with completed verification cycles may still have internal awareness gaps. Companies should first establish Level B foundations, including a formal policy, a functioning reporting channel, and a baseline self assessment with participation from frontline

workers. Self assessments should be based on behavioral evidence and observed workplace practice rather than only document checklists. Workers from different shifts, departments, and tenure groups should also be included to reduce the risk of overestimating organizational maturity.

For the Mongolian National Mining Association (MNMA) and ToSMM, the findings suggest that one time TSM training alone is not sufficient to build operational understanding of Indicator 3. Recurring training linked to the verification cycle should be considered, with greater emphasis on explaining Indicator 3 concepts using language and examples relevant to the Mongolian mining context. The handbook developed in this study can serve as an initial training and implementation guide, although further testing across a wider range of companies is needed before broader sector adoption.

For TSM framework development at the international level: The enforcement-harassment paradox identified in this study represents a gap in the SHRW protocol itself, not only in its Mongolian application. The protocol requires reporting mechanisms but does not define the boundary between legitimate enforcement and reportable conduct. MAC and national TSM bodies should consider developing supplementary guidance on this distinction, particularly for high-risk industrial settings where safety instructions must be strictly enforced.

7.4 Limitations of the Study

The findings of this study must be interpreted within the boundaries of its design. Six limitations apply.

Sample scope: Two companies were studied. Site A and Site B differ substantially in size, ownership, resource type, and location, not only in TSM adoption stage. Findings cannot be generalized to the Mongolian mining sector as a whole.

Small manager subgroup at Site A: Only five managers responded. The finding that managers record the lowest SHRW mean is directionally consistent with focus group evidence but cannot be stated with statistical confidence.

Qualitative data from Site A only: The focus group was conducted exclusively at Site A. Survey signals from Site B, particularly the identified versus unidentified score gap, cannot be explained with the same evidential depth.

No pre- and post-measurement: The study does not measure outcomes before and after handbook implementation. Whether the improvements identified produce the intended results requires a longitudinal follow-up study beyond the scope of this thesis.

Social desirability risk at Site B: Survey administration was supervisor-accompanied and workers preferred private spaces. The structural conditions of a large state-owned enterprise cannot be fully corrected for in analysis, and some identified responses may reflect the social environment rather than honest assessment.

Excluded perspectives and protocols: Community members, regulators, contractors, and suppliers are not represented. Two TSM protocols, crisis management and prevention of child and forced labor, fall outside the project scope and are not addressed.

7.5 Recommendations for Future Research

Six research directions emerge from the findings and limitations of this study, ordered from the most immediate to the most expansive.

Longitudinal evaluation of handbook effectiveness: The most direct next step is a follow-up study measuring SHRW outcomes after handbook implementation. This study provides the pre-measurement baseline. A follow-up should test whether Q9 and Q10 scores improve, whether enforcement-harassment confusion decreases, and whether the identified versus unidentified score gap at Site B narrows as implementation matures.

Sector-wide survey: A survey covering ten or more Mongolian mining companies at different adoption stages and commodity types would allow findings to be generalized beyond the two- site sample. The survey instrument developed for this study is directly reusable.

Validation of the enforcement-harassment decision framework: The decision framework developed in Chapter 6 has not been tested in practice. Future research should examine whether supervisors trained with this framework report greater confidence in enforcement and whether consistent judgements are produced across different supervisory contexts.

TSM self-assessment reliability: Future research should examine quantitatively whether self-assessment scores overestimate performance when evaluators lack conceptual

grounding, comparing self-assessment scores with independent verification scores and testing whether structured reflection sessions prior to assessment improve accuracy.

Comparative study across Asian TSM countries: Mongolia is the third Asian country to adopt TSM. A comparative study would identify which challenges are Mongolia-specific and which are structural features of applying a Canadian-origin framework across different cultural environments.

Longitudinal study of organizational cultural change: The handbook can build systems and train individuals but cannot directly produce cultural change. Future research should investigate what produces the cultural difference observed between Site A and Site B, and how long sustained TSM implementation takes to generate measurable change. This requires repeated observation and focus group discussion over three to five years and represents the most significant open question raised by this study.

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Appendices

Appendix A

Survey Questionnaire

ТУУТ – “Тогтвортой уул уурхайн төлөө” санал асуулга

Энэхүү асуулга нь байгууллагын үйл ажиллагаатай холбоотой ажилтнуудын санал, ойлголтыг тодорхойлох зорилготой. Энэ нь ямар нэгэн үнэлгээ, аудит биш, зөвхөн дотоод сайжруулалтад зориулсан санал асуулга юм. Таны өгсөн хариулт нууцлалтай хадгалагдах бөгөөд нэр болон хувь хүний мэдээлэл цацруулахгүй. Та асуулт бүрийг өөрийн бодит туршлага, ойлголтод үндэслэн үнэн зөв бөглөнө үү. Асуулгыг бөглөхөд ойролцоогоор 5 минут зарцуулна.

Таны хэлтэс / ажлын чиглэл:

……

Хүйс: ☐ Эр ☐ Эм ☐ Бусад

Нас: ☐ 18–25 ☐ 26–35 ☐ 36–45 ☐ 46–55 ☐ 56+ ☐ Хариулахыг хүсэхгүй

Таны албан тушаалын түвшин

☐ Гүйцэтгэх ажилтан ☐ Ахлах / Хянагч ☐ Удирдах ажилтан

Ажил эрхлэлтийн хэлбэр

☐ Байнгын ☐ Гэрээт ☐ Дадлагажигч

Энэ талбайд ажилласан хугацаа

☐ <6 сар ☐ <1 жил ☐ 1–5 жил ☐ 6–10 жил ☐ >10 жил

Хариултын үнэлгээ

1	2	3	4	5	Мэдэхгүй	Миний ажилд хамаарагүй
Огт санал нийлэхгүй	Санал нийлэхгүй	Дундаж	Санал нийлнэ	Маш их санал нийлнэ	•	•

ОРОН НУТГИЙН ХАРИЛЦААНЫ ПРОТОКОЛ								
№	Асуулт	1	2	3	4	5	Мэдэхгүй	[illegible]
1	Орон нутгийн иргэд (малчин, нүүдэлчин)-тэй харилцах нь миний ажилтай хамааралтай гэж би боддог	☐	☐	☐	☐	☐	☐	☐
2	Орон нутгийн иргэд нь ердийн иргэдээс ялгаатай, онцгой эрхтэй гэдгийг би ойлгодог	☐	☐	☐	☐	☐	☐	☐

ОРОН НУТГИЙН ХАРИЛЦААНЫ ПРОТОКОЛ								
3	Орон нутгийн иргэдийн соёл, заншил, уламжлалыг хүндэтгэж, ялгаварлан гадуурхахгүй байх нь миний ажлын нэг хэсэг гэдгийг ойлгодог	☐	☐	☐	☐	☐	☐	☐
5	Орон нутгийн иргэдтэй холбоотой асуудал гарсан тохиолдолд хаана, хэнд мэдээлэх нь тодорхой байдаг	☐	☐	☐	☐	☐	☐	☐
6	Нөлөөллийн бүсийн орон нутгийн иргэдэд үзүүлэх сөрөг нөлөөллийг бууруулах арга хэмжээ хэрэгждэг	☐	☐	☐	☐	☐	☐	☐

АЮУЛГҮЙ, ЭРҮҮЛ, ХҮНДЭТГЭЛТЭЙ АЖЛЫН БАЙР								
№	**Асуулт**	**1**	**2**	**3**	**4**	**5**	**Мэдэхгүй**	[illegible]
7	Манай байгууллагад ажилтны аюулгүй байдал, эрүүл мэнд, хүндэтгэлтэй ажлын орчин нь удирдлагын шийдвэр гаргалтад ач холбогдол өгдөг	☐	☐	☐	☐	☐	☐	☐
8	Би ажлын байртай холбоотой эрсдлийн талаар санал, хүсэлтээ хаана, яаж мэдээлэхээ тодорхой мэддэг	☐	☐	☐	☐	☐	☐	☐
9	Манай байгууллагад асуудал, алдааг хөндөх болон тэдгээрээс суралцах нөхцөл, боломж бүрдсэн байдаг	☐	☐	☐	☐	☐	☐	☐
10	Ажилтнуудаас ирсэн мэдээлэлд үндэслэн бодит шийдвэр гаргаж, сайжруулалт хийгддэг	☐	☐	☐	☐	☐	☐	☐
11	Манай байгууллага ажилтнуудын хэрэгцээ, шаардлагад нийцсэн сургалт, хөгжлийн үйл ажиллагааг зохион байгуулдаг	☐	☐	☐	☐	☐	☐	☐

УСНЫ МЕНЕЖМЕНТ								
№	**Асуулт**	**1**	**2**	**3**	**4**	**5**	**Мэдэхгүй**	[illegible]
12	Би ажлын байрандаа ямар төрлийн ус хэрэглэгддэгийг, тэдгээр нь хэрхэн зохицуулагддагийг мэддэг (ногоон усалгааны ус, саарал ус, гүний ус г.м)	☐	☐	☐	☐	☐	☐	☐
13	Би ажлын байрандаа ус алдагдал, усны бохирдол үүсгэж болох нөхцөл байдлыг таньж чаддаг	☐	☐	☐	☐	☐	☐	☐
14	Би ажлын явцад усыг хэрэгцээнээсээ илүү хэрэглэхгүй байхыг өдөр бүр анхаардаг	☐	☐	☐	☐	☐	☐	☐
15	Ус алдагдал эсвэл бохирдол харвал хариуцлагатай хүнд нь мэдэгддэг	☐	☐	☐	☐	☐	☐	☐
16	Ус алдагдал эсвэл бохирдол гарсан үед хэнд мэдээлэх, анхны арга хэмжээ хэрхэн авахыг би тодорхой мэддэг	☐	☐	☐	☐	☐	☐	☐
17	Манай компани усны хэрэглээг удирдах, хэмнэх талаар тодорхой зорилт тавьсан гэдгийг би мэддэг	☐	☐	☐	☐	☐	☐	☐

ХАЯГДЛЫН МЕНЕЖМЕНТ								
№	**Асуулт**	**1**	**2**	**3**	**4**	**5**	**Мэдэхгүй**	[illegible]
18	Би ажлын байрандаа үүсдэг хаягдлын төрлүүд (ердийн хаягдал, тос, химийн бодис гэх мэт)-ийг мэддэг	☐	☐	☐	☐	☐	☐	☐
19	Хаягдал буруу газарт асгарах, химийн бодис гоожих, эсвэл хог зориулалтын бус газарт хаях зэрэг нөхцөл үүссэн тохиолдолд хэнд мэдээлэхийг би тодорхой мэддэг	☐	☐	☐	☐	☐	☐	☐
20	Би хаягдлыг төрлөөр нь ялгаж, зохих саванд буюу зориулалтын газарт хаядаг	☐	☐	☐	☐	☐	☐	☐

УУР АМЬСГАЛЫН ӨӨРЧЛӨЛТ								
№	**Асуулт**	**1**	**2**	**3**	**4**	**5**	**Мэдэхгүй**	[illegible]
22	Уул уурхайн үйл ажиллагаа нь уур амьсгалд (дэлхийн дулаарал, хүлэмжийн хий гэх мэт) нөлөөлдөг талаар байгууллагаас мэдээлэл өгсөн	☐	☐	☐	☐	☐	☐	☐
23	Уур амьсгалын өөрчлөлттэй холбоотой компанийн зорилт, үүрэг амлалтыг байгууллагаас танилцуулсан	☐	☐	☐	☐	☐	☐	☐
24	Би өдөр тутмын ажилдаа уур амьсгалын өөрчлөлтийг сааруулах арга, тухайлбал эрчим хүч хэмнэх арга (гэрэл унтраах, техникийг ажиллагаагүй үед унтраах гэх мэт)-ийг хэрэглэдэг	☐	☐	☐	☐	☐	☐	☐

ТЭГШ БАЙДАЛ, ХҮНДЭТГЭЛ								
№	**Асуулт**	**1**	**2**	**3**	**4**	**5**	**Мэдэхгүй**	[illegible]
25	Би ажлын байранд ялгаварлан гадуурхалт, шударга бус хандлагын талаарх мэдлэгтэй	☐	☐	☐	☐	☐	☐	☐
26	Манай байгууллага ажилчдад тэгш байдал, хүндэтгэлтэй харьцааны талаар сургалт, мэдээлэл өгдөгийг би мэддэг	☐	☐	☐	☐	☐	☐	☐
27	Хэрэв ажлын байранд ялгаварлан харьцах, шударга бус хандлага тохиолдвол би юу хийх ёстойгоо мэддэг	☐	☐	☐	☐	☐	☐	☐
28	Ажлын байранд асуудал, санал гарвал хаана, хэнд хандахыг би мэддэг	☐	☐	☐	☐	☐	☐	☐

БАЙГАЛЬ ОРЧИН								
№	**Асуулт**	**1**	**2**	**3**	**4**	**5**	**Мэдэхгүй**	[illegible]

БАЙГАЛЬ ОРЧИН								
29	Миний ажил байгаль орчин (ургамал, амьтан)-д хэрхэн нөлөөлдгийг мэднэ	☐	☐	☐	☐	☐	☐	☐
30	Би байгаль орчныг хамгаалахтай холбоотой ажлын байрны шаардлага, зааврыг мэддэг	☐	☐	☐	☐	☐	☐	☐
31	Байгаль орчинд үзүүлэх сөрөг нөлөөллөөс сэргийлэх шаардлагыг мөрдөж ажилладаг	☐	☐	☐	☐	☐	☐	☐

32. Асуулт 1–31-д дурдсан шаардлагуудыг хэрэгжүүлэхэд таны хувьд хамгийн их хүндрэл учруулж буй хүчин зүйлсийг сонгоно уу (хэдэн ч хариулт сонгож болно):

☐ Цаг хугацаа хүрэлцдэггүй
☐ Мэдлэг, ур чадвар дутмаг
☐ Тоног төхөөрөмж, нөөц хангалтгүй
☐ Үүрэг, хариуцлага тодорхой бус
☐ Удирдлагын дэмжлэг хангалтгүй
☐ Бусад:

33. Бидний зүгээс асуугаагүй таны бодлоор Тогтвортой уул уурхайг хөгжүүлэхэд чухал гэж бодож байгаа зүйл байвал энд бичнэ үү

Appendix B

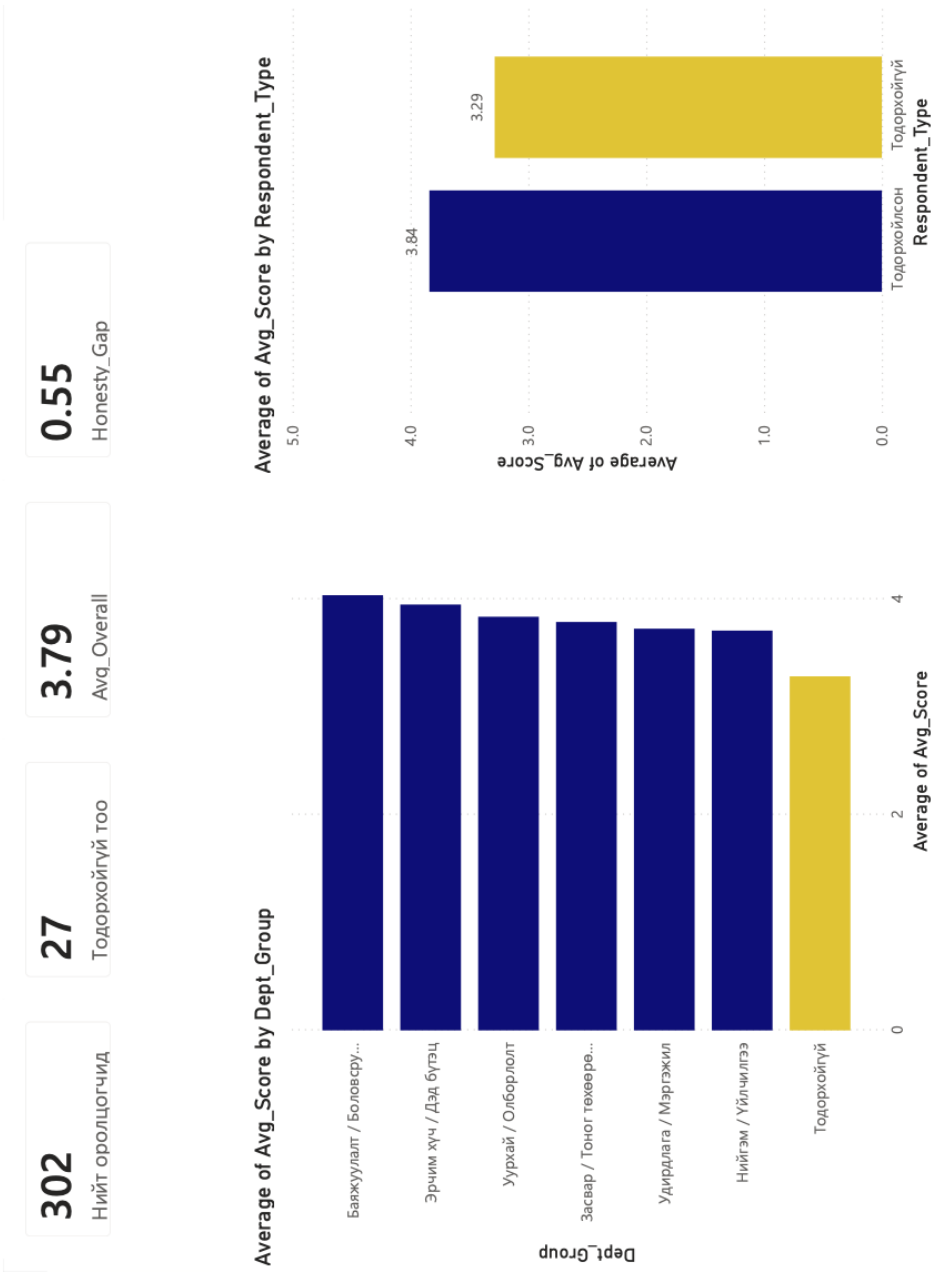
Cronbach's alpha by protocol and site

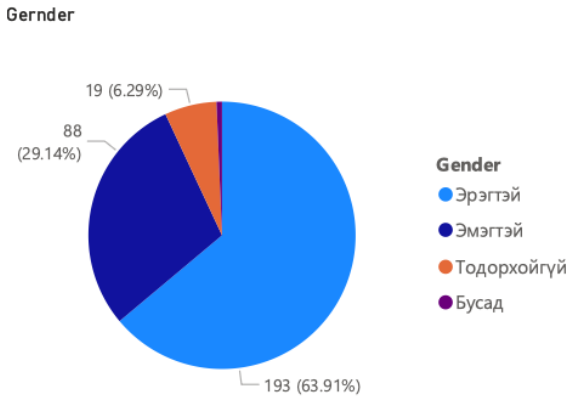
Protocol	Site A (k / n / α)	Site B (k / n / α)
SHRW	**5 / 79 / 0.898 (Good)**	**5 / 267 / 0.864 (Good)**
Water Stewardship	6 / 81 / 0.951 (Excellent)	6 / 243 / 0.902 (Excellent)
Tailings Management	4 / 86 / 0.917 (Excellent)	4 / 265 / 0.788 (Acceptable)
Climate Change	4 / 79 / 0.853 (Good)	3 / 242 / 0.813 (Good)
EDI	4 / 88 / 0.894 (Good)	4 / 264 / 0.861 (Good)
Biodiversity	4 / 85 / 0.947 (Excellent)	3 / 243 / 0.854 (Good)
Community Relationships	6 / 30 / 0.785 (Acceptable)	5 / 143 / 0.686 (Questionable)
Overall	**33 / 22 / 0.964**	**29 / 104 / 0.921**

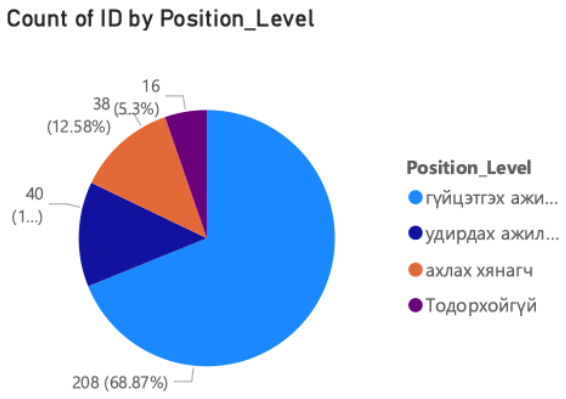
Item	Site A (r / α if deleted)	Site B (r / α if deleted)
Q7 – Leadership commitment	0.719 / 0.878	0.716 / 0.823
Q8 – Reporting awareness	0.772 / 0.866	0.631 / 0.855
Q9 – Psychological safety	0.752 / 0.868	0.768 / 0.808
Q10 – Feedback effectiveness	0.716 / 0.886	0.683 / 0.836
Q11 – Training satisfaction	0.777 / 0.870	0.625 / 0.848

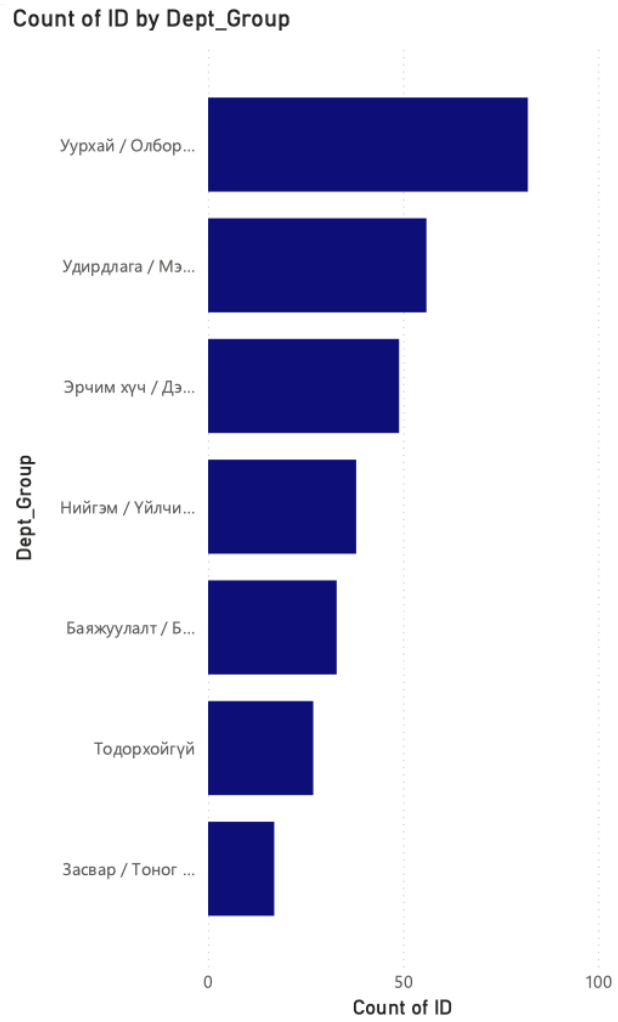
Appendix C

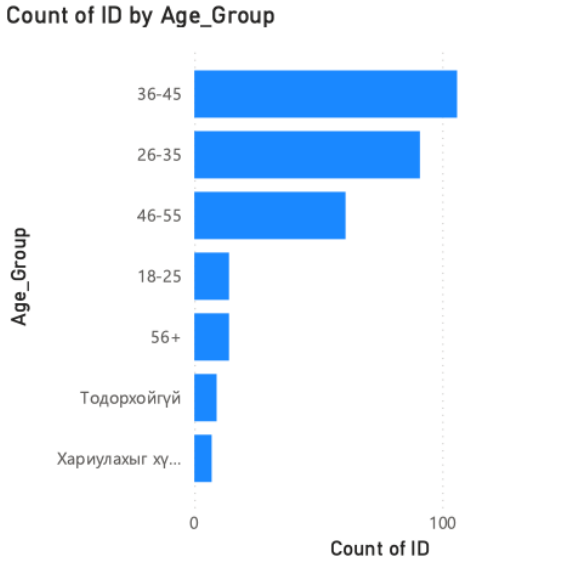
Site B survey analysis

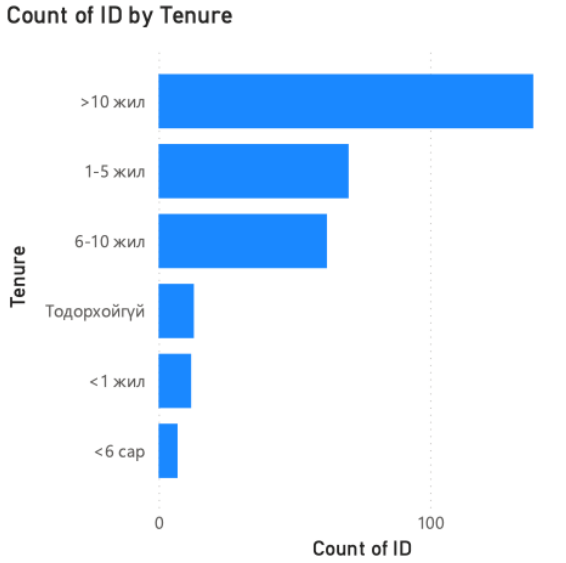



Gernder
19 (6.29%)
88
(29.14%)
193 (63.91%)
Gender
Эрэгтэй
Эмэгтэй
Тодорхойгүй
Бусад


Count of ID by Position_Level
16
38 (5.3%)
(12.58%)
40
(1...)
208 (68.87%)
Position_Level
гүйцэтгэх ажи...
удирдах ажил...
ахлах хянагч
Тодорхойгүй


Count of ID by Dept_Group
Уурхай / Олбор...
Удирдлага / Мэ...
Эрчим хүч / Дэ...
Нийгэм / Үйлчи...
Баяжуулалт / Б...
Тодорхойгүй
Засвар / Тоног ...
Dept_Group
0
50
100
Count of ID


Count of ID by Age_Group
36-45
26-35
46-55
18-25
56+
Тодорхойгүй
Хариулахыг хү...
Age_Group
0
100
Count of ID


Count of ID by Tenure
>10 жил
1-5 жил
6-10 жил
Тодорхойгүй
<1 жил
<6 сар
Tenure
0
100
Count of ID

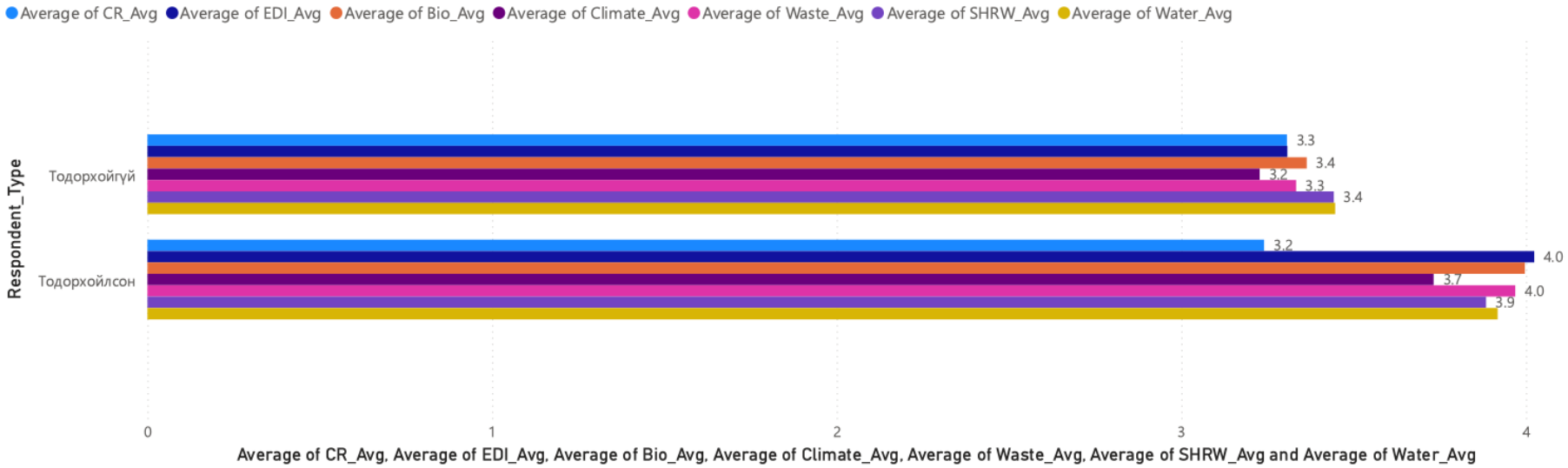
3.25	3.85	3.88	3.91	3.69	3.96	3.94
CR_Overall	SHRW_Overall	Water_Overall	Waste_Overall	Climate_Over...	EDI_Overall	Bio_Overall

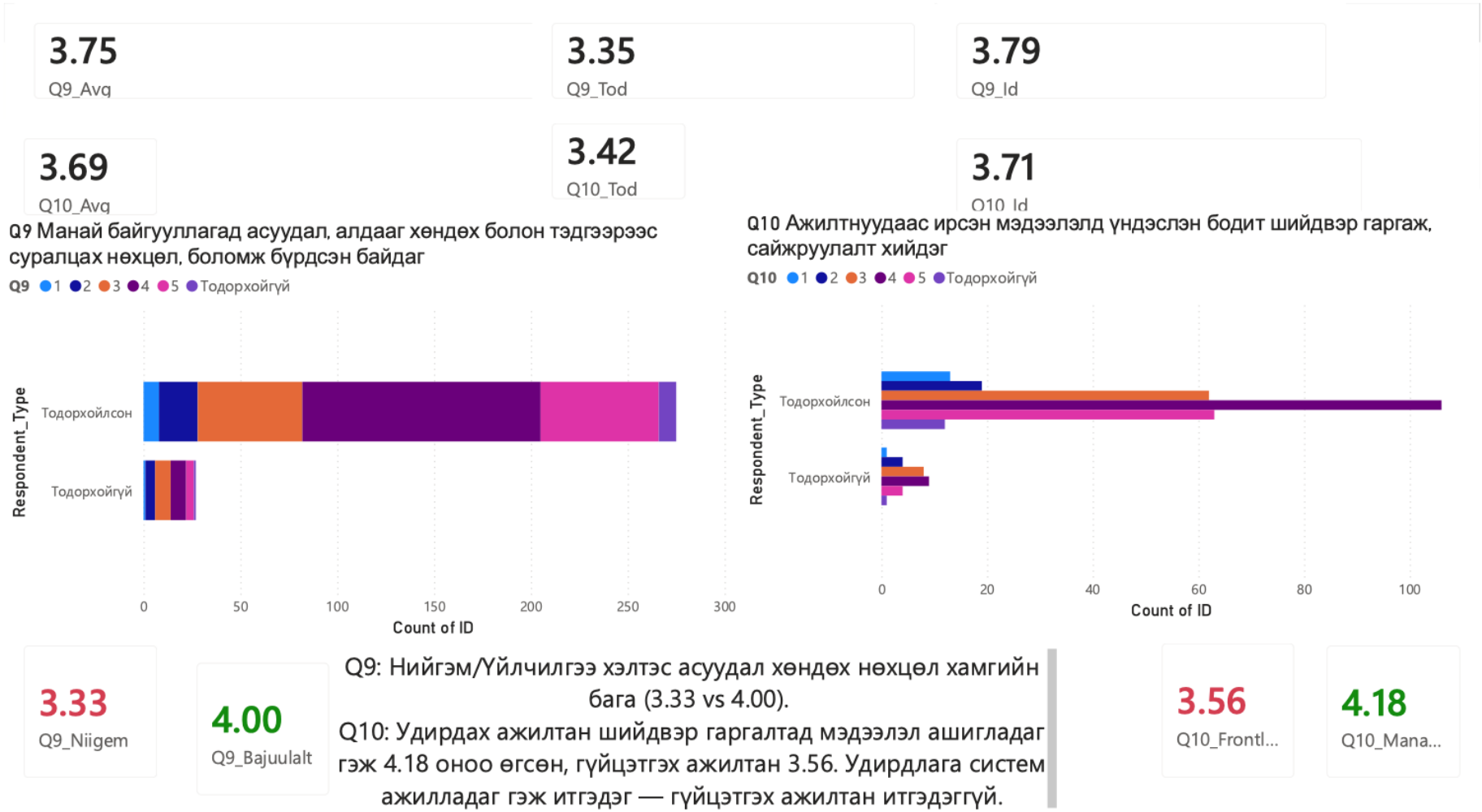
ТОТО: Хамгийн их зөрүү

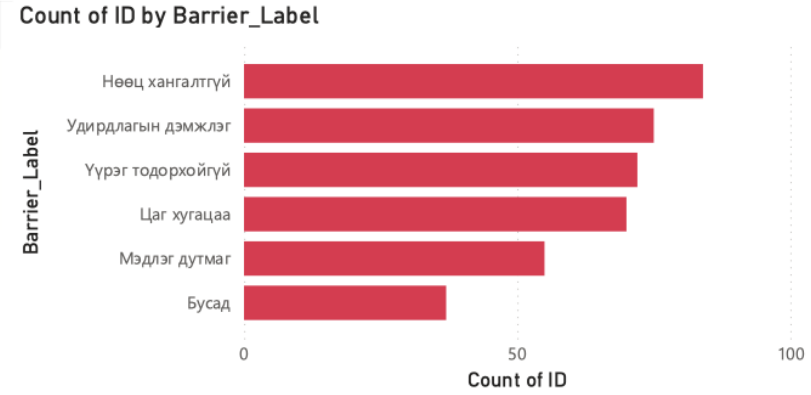
0.72
EDI_Gap

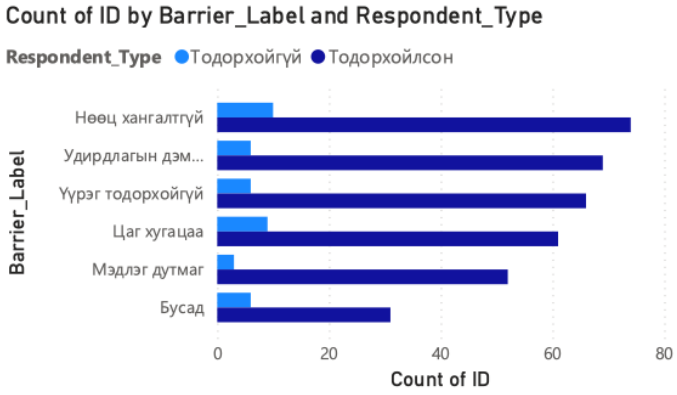
Тодорхойгүй бүлэг тэгш байдал, хүндэтгэлийн протоколд хамгийн бага оноо өгсөн (3.31 vs 4.02). Энэ нь нэр нуусан ажилтнууд ялгаварлан гадуурхалтын талаар мэдлэг дутмаг, эсвэл бодит туршлагатай болохыг харуулж байна.

Протокол тус бүр: Тодорхойгүй vs Тодорхойлсон




3.75
Q9_Avg
3.35
Q9_Tod
3.79
Q9_Id
3.69
Q10_Avg
3.42
Q10_Tod
3.71
Q10_Id
Q9 Манай байгууллагад асуудал, алдааг хөндөх болон тэдгээрээс суралцах нөхцөл, боломж бүрдсэн байдаг
Q9 1 2 3 4 5 Тодорхойгүй
Respondent_Type
Тодорхойлсон
Тодорхойгүй
0 50 100 150 200 250 300
Count of ID
Q10 Ажилтнуудаас ирсэн мэдээлэлд үндэслэн бодит шийдвэр гаргаж, сайжруулалт хийдэг
Q10 1 2 3 4 5 Тодорхойгүй
Respondent_Type
Тодорхойлсон
Тодорхойгүй
0 20 40 60 80 100
Count of ID
3.33
Q9_Niigem
4.00
Q9_Bajuulalt
Q9: Нийгэм/Үйлчилгээ хэлтэс асуудал хөндөх нөхцөл хамгийн бага (3.33 vs 4.00).
Q10: Удирдах ажилтан шийдвэр гаргалтад мэдээлэл ашигладаг гэж 4.18 оноо өгсөн, гүйцэтгэх ажилтан 3.56. Удирдлага систем ажилладаг гэж итгэдэг — гүйцэтгэх ажилтан итгэдэггүй.
3.56
Q10_Frontl...
4.18
Q10_Mana...

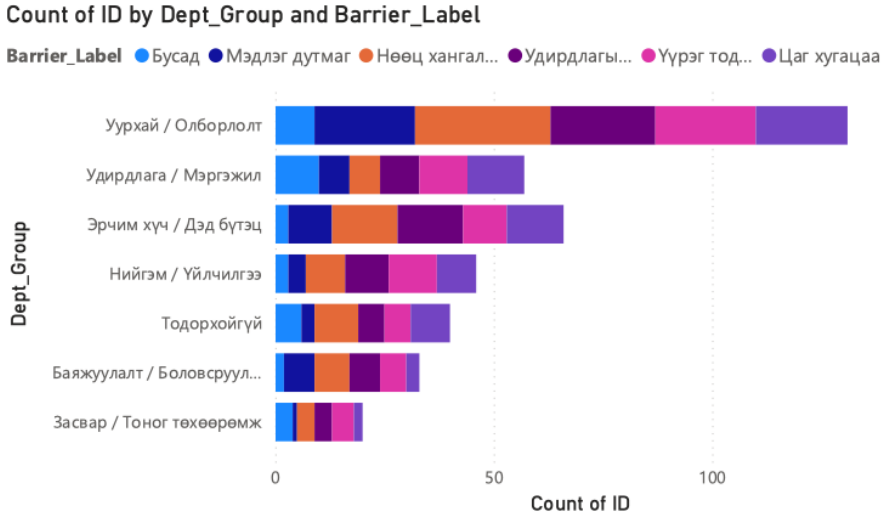


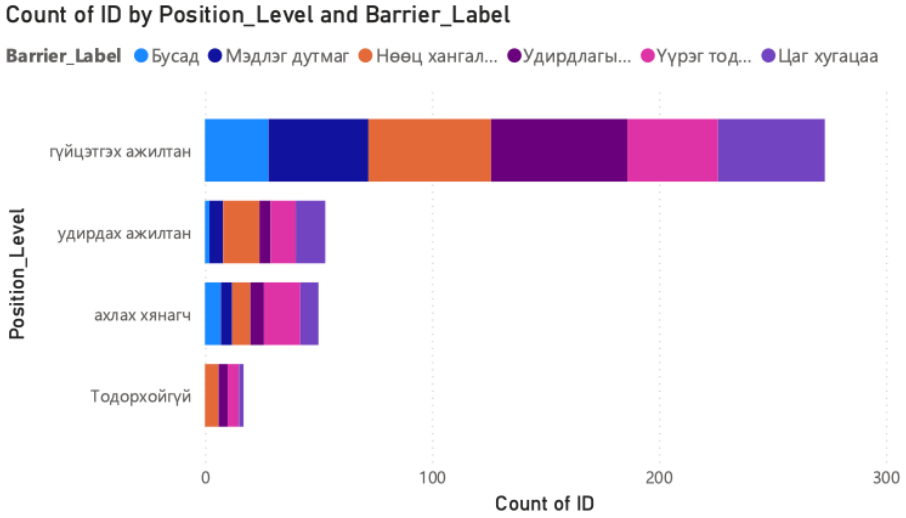


75

MgmtSupport_Count

Удирдлагын дэмжлэг хангалтгүй гэж сонгосон 75 хүн АЭХАБ-д 3.47 оноо өгсөн (бусад: 3.97). Энэ саад бэрхшээл нь бодит туршлагатай давхцаж байна — удирдлагын дэмжлэггүй хүмүүс ажулгүй байдлыг бага үнэлдэг.

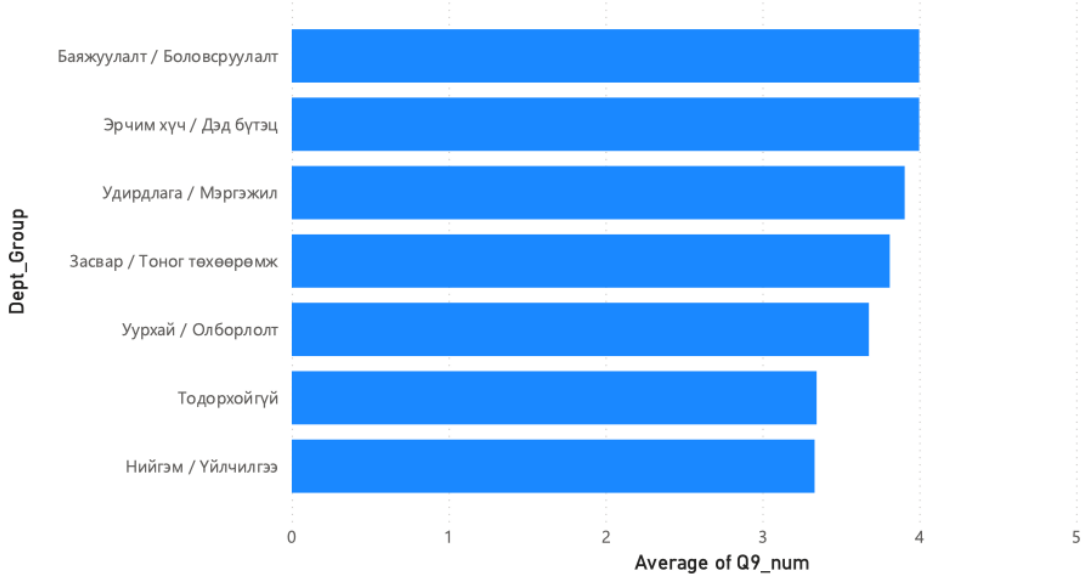




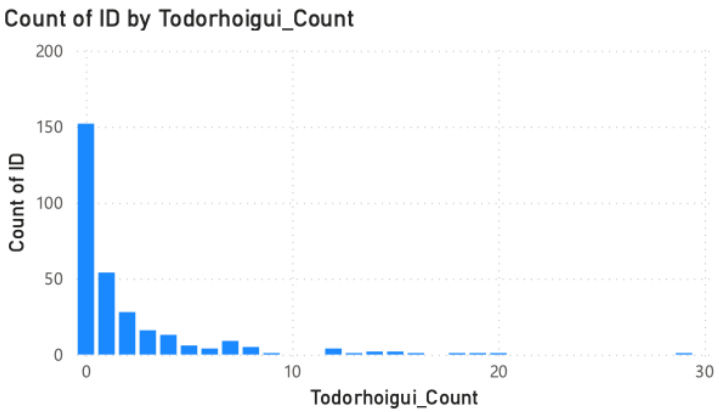
3.05 Tenure10_Tod	3.92 Tenure10_Id	0.87 Tenure10_Gap
4.00 Manager_Avg	3.74 Frontline_Avg	0.26 Position_Gap

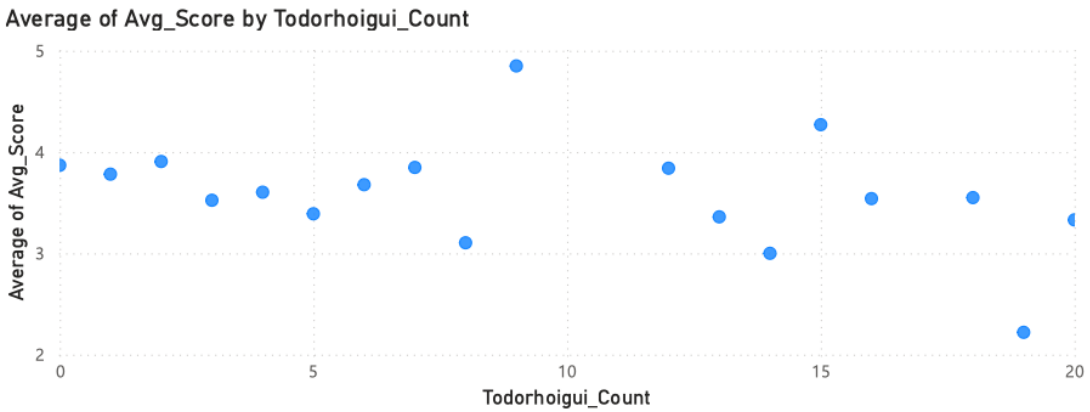
3.13 Female_Tod_EDI	3.94 Female_Id_EDI	0.82 Female_EDI_Gap
3.92 Hidden0_Avg	3.82 Hidden1_Avg	3.61 Hidden2_Avg

Average of Q9_num by Dept_Group

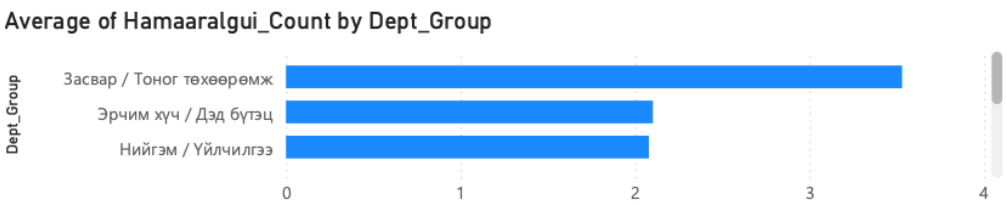


(1) >10 жил ажилласан Тодорхойгүй ажилтнууд хамгийн бага оноо өгсөн — 3.05 vs 3.92, зөрүү 0.87. (2) Тодорхойгүй эмэгтэйчүүд тэгш байдлыг 3.12 гэж үнэлсэн — хамгийн бага. (3) Удирдах ажилтан 4.00, гүйцэтгэх 3.74 — удирдлага систем ажилладаг гэж итгэдэг, гүйцэтгэх ажилтан итгэдэггүй. (4) Асуулт алгасах тоо нэмэгдэх тусам оноо буурдаг — зугтаалт нь сөрөг хандлагатай давхцдаг.





ID	Dept_Group	Gender	Position_Level	Tenure	Todorhoigui_Count	Avg_Score
198	Тодорхойгүй	Эрэгтэй	гүйцэтгэх ажилтан	>10 жил	29	
176	Уурхай / Олборлолт	Эрэгтэй	гүйцэтгэх ажилтан	1-5 жил	20	3.33
197	Нийгэм / Үйлчилгээ	Тодорхойгүй	удирдах ажилтан	1-5 жил	19	2.22



1.98
Avg_Todorhoigui_Skips

1.45
Avg_Hamaaralgui_Skips

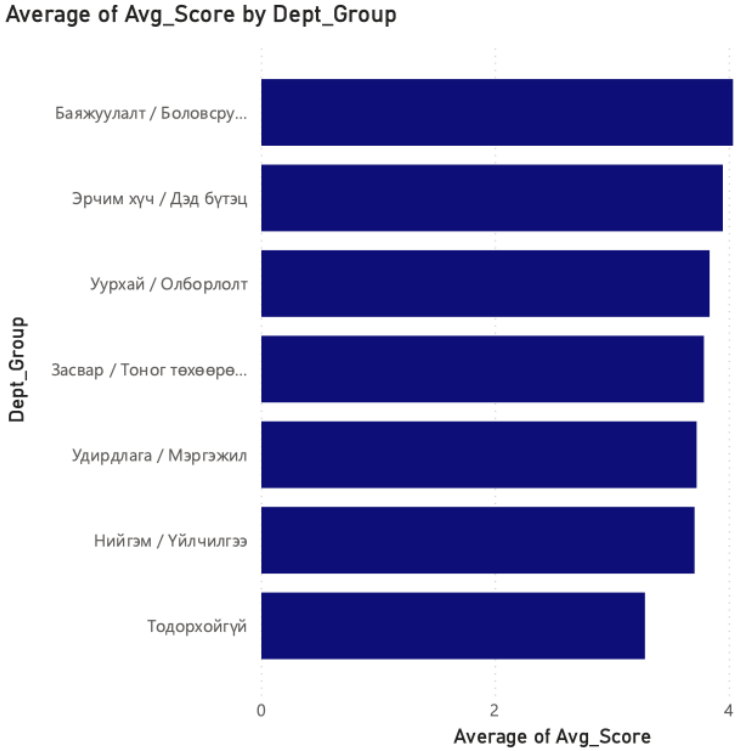
Асуулт алгасах нь санамсаргүй биш. Тодорхойгүй хариулт 0 өгсөн хүмүүс 3.87, 6+ алгассан хүмүүс 3.61 оноо өгсөн. АЭХАБ протоколд хамгийн хүчтэй корреляци (r = -0.223): алгасах тоо нэмэгдэх тусам аюулгүй байдлын оноо буурдаг.

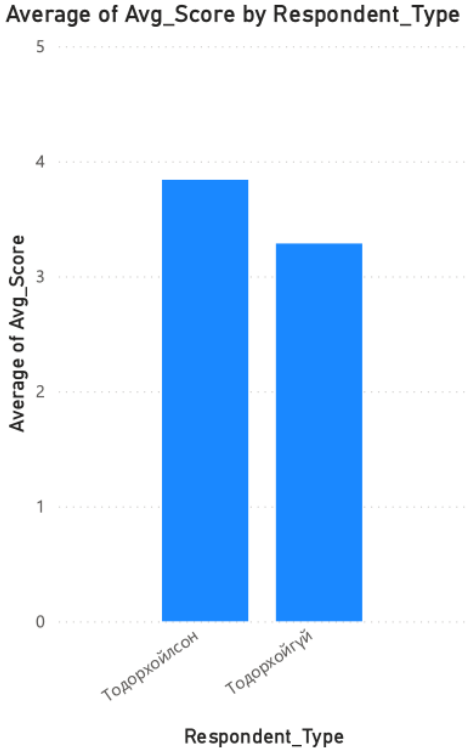
0.72	0.87	0.82	0.26	0.55
Gap1_EDI	Gap2_Te...	Gap3_Female...	Gap4_Positi...	Honesty_Gap

Нөөц хангалтгүй

84

Top_Barrier





ТУУТ хэрэгжилтийн судалгаанд гурван үндсэн хандлага илэрлээ. (1) Нэр нуусан ажилтнууд бүх протоколд бага оноо өгсөн — тэгш байдалд хамгийн их зөрүү (+0.72). Энэ нь сэтгэл зүйн аюулгүй байдал хангалтгүй гэдгийг батлав. (2) Удирдах ажилтан систем ажилладаг гэж итгэдэг — гүйцэтгэх ажилтан итгэдэггүй. Хэрэгжилт удирдлагын түвшинд зогссон. (3) >10 жил

Appendix D

Data administration process



Appendix E

Inductive thematic analysis

Source: Focus group discussion, Site A· Date: 5 April 2026 · Participants: 19 employees · Duration: 09:55–15:00

Method: Inductive thematic analysis. Themes were derived from the raw discussion data without a pre-existing framework. Initial codes were generated line-by-line, then grouped into sub-themes and overarching themes through iterative review.

Theme	Sub-themes	Key finding
Theme 1 Knowledge and understanding deficits	– Translation and terminology barriers – Inconsistent understanding across levels – Insufficient unified training – Partial knowledge among assessment participants	The protocol was introduced without adequate capacity-building. Poor Mongolian translation compounded awareness gaps at every level, and knowledge remained concentrated in a small assessment team.

Theme 2 Structural and documentation barriers	– Inadequate evidence documentation – Weak cross-unit collaboration – Over-inflation of initial scores – ISO–TUUT transition friction	Organisational size, documentation gaps, and an incomplete ISO transition produced surface-level compliance. Initial self-assessments were rated too high, creating a score that cannot now be realistically adjusted.
Theme 3 Tension between operational discipline and psychological safety	– Erosion of supervisory authority – Risk of protocol misuse – Ambiguity between demand and harassment – Quasi-military industry culture	Supervisors reported reluctance to issue legitimate work requirements, fearing complaints under Indicator 3. Participants called urgently for clear criteria distinguishing work demands from harassment.
Theme 4 Measurement ambiguity and KPI integration	– Abstract quality of Indicator 3 – Difficulty operationalising 'respect' – Preference for incentive-based KPIs – Need for longitudinal measurement	Indicator 3 has not yet been embedded in operations and is experienced as abstract. Participants favoured reward-based KPI mechanisms and called for point-based scoring adapted to local conditions.
Theme 5 Contextual and cultural adaptation needs	– Mismatch with Mongolian context – Workforce skill heterogeneity – Interest in international benchmarks – Need for localised scoring	International guidebook examples do not map cleanly onto Mongolian mining realities. Participants sought locally adapted scoring methods and examples from high-performing organisations.
Theme 6 Communication channels and trust deficit	– Insufficient reporting channels – Low organisational trust – Confidentiality as prerequisite – Absence of feedback loop	Weak information flows and low trust undermine the conditions the protocol seeks to build. Participants emphasised that transparent feedback loops — showing outcomes of reported issues — are essential for credibility.

Representative participant statements
Theme 1 *"People who knew their jobs managed to produce desired outcomes even without conceptual understanding of the protocol."*
Theme 2 *"The initial assessment was rated too high. Now it has become structurally impossible to lower it."*
Theme 3 *"The distinction and filtering criteria between work requirements and harassment must be clearly defined."*
Theme 4 *"It is unclear how to define 'respect' as a concept and link it to KPIs."*
Theme 5 *"Guidebook examples may not align with Mongolian company conditions; practical fit is unclear."*
Theme 6 *"A feedback loop is essential — the number of resolved issues and responses given must be communicated transparently."*