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Topic - problem statements (one to be chosen):

☐ **Topic - problem statement 1**	**Improving the accuracy of estimating explosive ordnance hazardous areas**
☒ **Topic - problem statement 2**	**Quantifying residual risk in land release**

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Applying the FAIR Model to Quantify Residual Risk in Humanitarian Land Release

Introduction

Explosive ordnance (EO) leaves a deadly legacy long after conflicts end. Humanitarian mine action aims to release land, so communities can safely return and rebuild their livelihoods. Yet a residual risk inevitably remains even after full clearance - the possibility that some explosive hazards were missed or could still be unearthed years later will always remain. No post-conflict environment is completely risk-free, and risk can never (GICHD, IMAS 2020, v) be totally eliminated. It can only be mitigated and managed. Mine action practitioners and policymakers face the challenge of determining what level of residual risk is tolerable and how to quantify and communicate that risk. This paper explores how the Factor Analysis of Information Risk (FAIR) model, a quantitative risk analysis framework, can be adapted to the mine action context to measure residual risk in land release (the process of producing land that is safe to use).

This submission provides an overview of the historical evolution of residual risk management in mine action, it reviews existing frameworks (IMAS and ISO 31000), and then it explains the FAIR methodology in detail. Each component of FAIR (asset, threat frequency, vulnerability, and loss magnitude) is adapted to the realities of landmine/UXO contamination. We discuss how economic metrics like Value of a Statistical Life (VSL) and lost economic output can be used to quantify potential losses in data-scarce, post-conflict environments. Hypothetical case studies illustrate how a FAIR-based approach enables transparent, evidence-based decision-making, and we compare FAIR's utility to current IMAS-based practices, highlighting strengths, limitations, and opportunities for integration. The goal is to show that a rigorous risk quantification model like FAIR can complement humanitarian mine action standards, helping stakeholders make clearer choices about allocating resources and refine current risk management approaches.

Historical and Institutional Overview of Residual Risk Management in Mine Action

After World War II, European nations faced extensive EO contamination, undertaking massive clearance efforts that established foundational mine clearance practices. Despite these efforts, it became clear that completely eliminating explosive threats was impractical, as ordnance continued, and continues, to surface decades later. This established an early understanding of the concept of residual risk, where some level of threat exists, even after thorough clearance.

The first humanitarian mine action was carried out in 1989, in Afghanistan. This model quickly expanded and developed to include heavily contaminated regions in Africa and Southeast Asia during the early 1990s, including Angola, Mozambique, and Cambodia (GICHD 2014, 7). Early humanitarian clearance efforts prioritized removing all mines, borrowing strongly from military methods in the hope of ensuring complete safety. However, these ambitious goals proved impractical, leading to the recognition that scarce resources were being inefficiently allocated toward areas of minimal threat (GICHD 2014, 13).

This realization drove a strategic shift in mine action from an "all or nothing" approach towards explicit risk management. The introduction of the land release methodology in the early 2000s marked a significant turning point, emphasizing evidence-based decision-making rather than exhaustive clearance. Under this new paradigm, land could be confidently declared safe when rigorous survey and sampling demonstrated no credible threat remained, even without fully clearing every square meter (GICHD 2014, 13).

This transition was formalized through International Mine Action Standards (IMAS), which introduced the principle of "all reasonable effort." IMAS defines residual risk explicitly, acknowledging that absolute clearance is unattainable and promoting responsible management of remaining threats. Residual risk is thus accepted when all reasonable efforts—adequate surveying, targeted clearance, and thorough risk assessment—have been completed, with nation states being responsible for any future liability considerations (UNMAS 2018, 5).

Countries transitioning from proactive clearance operations to long-term residual risk management must establish sustainable structures, such as national explosive ordnance disposal (EOD) teams, community reporting mechanisms, and public education. Moving from the proactive to the reactive approach to managing residual contamination helps to maintain public safety and economic stability, ensuring the sustainability of land release efforts.

Overall, the historical evolution of mine action, from initial post-WW2 clearance, through early humanitarian interventions in Afghanistan and Africa, to the adoption of structured risk management and formal recognition of residual risk highlights the sector's adaptive approach in balancing safety, practicality, and resource allocation.

Overview of the FAIR Methodology (Factor Analysis of Information Risk)

FAIR is an established framework for quantitative risk analysis, originally developed for information security and operational risk management. It provides a standard taxonomy of risk factors and an analytical (Olaes 2025) model for deriving risk in consistent, financial terms. Unlike qualitative methods that use color-coded scores or rely on matrices, FAIR estimates the frequency and severity of loss events as probability distributions, enabling risk to be expressed as expected loss (e.g., dollars per year). It defines risk as the likelihood and impact of future loss.

At a high level, FAIR breaks any risk scenario into four primary components:

- Asset at risk: something of value that could be harmed (tangible or intangible).
- Threat event: an actor or condition that could act upon the asset in a harmful way.
- Vulnerability (of the asset to the threat): the likelihood that the threat’s action would result in a loss event.
- Impact (Loss Magnitude): the consequences if a loss event occurs, measured in terms of value lost.

In FAIR terms, the combination of Threat Event Frequency (how often a threat is present or attempts to cause harm) and Vulnerability (the probability that when a threat event occurs, it actually results in a loss) gives the Loss Event Frequency (LEF). This is the expected rate at which the asset will experience loss events.

Separately, Loss Magnitude (LM) encompasses the expected severity of loss per event, which FAIR further divides into Primary Loss (direct, immediate damage to the asset owner) and Secondary Loss (follow-on impacts like reputation damage, legal costs, etc. due to reactions of external parties) . Finally, Risk can be quantified as a probability distribution or simply the product of frequency and magnitude (often expressed as an annualized loss expectancy). In practice, performing a FAIR analysis involves several steps:

Figure 1: FAIR risk taxonomy. (McCoy and Jones 2017)

1. **Scope the risk scenario:** Clearly define the asset, the threat of concern, and the type of loss event. (In cyber terms, for example, “unauthorized access to customer data by a hacker” - in mine action, we will analogously define scenarios like “a civilian stepping on a residual contamination on released land.”)

2. **Identify and quantify the factors:** Estimate the Threat Event Frequency (how often the scenario could happen), and estimate Vulnerability (probability that if the threat occurs it causes harm). Also estimate the Loss Magnitude, considering both primary losses (e.g. immediate injury, damage) and secondary effects (e.g. broader economic impact, response costs). These estimates can be ranges or probability distributions to reflect uncertainty.

3. **Calculate risk:** Derive the Loss Event Frequency (typically = Threat Event Frequency × Vulnerability) and combine it with Loss Magnitude to compute an expected loss. Often Monte Carlo simulation or similar techniques are used to propagate uncertainty and obtain a distribution of risk (like an 80% confidence interval for annual loss).

4. **Evaluate and interpret:** Compare the quantified risk against criteria (such as tolerable risk levels or cost of mitigation). This informs decisions - e.g., is the risk high enough to warrant additional mitigation (like more clearance)? Or is it low enough that resources are better used elsewhere?

FAIR's power lies in making the assumptions explicit. Every input (frequency, probability, impact) must be estimated based on data or expert judgment, which then allows for a rational discussion about each factor. Rather than saying vaguely "this area is low risk," FAIR would have you quantify what "low" means (perhaps "there is a 1 in 1,000 chance per year of a mine accident in this area, with an expected cost of $X if it happens"). This aligns with the evidence-based ethos of IMAS - "evidence-based decision-making and policy development are more likely to be appropriate, well targeted and efficient", whereas "a lack of information and understanding (uncertainty) leads to poor risk management policies".

Adapting FAIR Components to the Land Release Context

Applying the FAIR model to quantify residual risk in mine action requires mapping its concepts onto the realities of EO contamination and clearance. Below, we break down each major FAIR component and describe its equivalent in the land release residual risk scenario:

- **Assets in Mine Action:** In cybersecurity, an "asset" might be data or an IT system. In humanitarian mine action, the assets at risk are primarily people - the civilians who use the land after it is released - and by extension their lives, health, and livelihoods. One can also view the cleared land itself as an asset, in the sense that it has value (for agriculture, housing, infrastructure) that is jeopardized if explosive hazards remain. The value of the asset drives the potential loss. For example, a village of 1,000 returnees farming on released land represents human lives (which we value via metrics like the Value of a Statistical Life) and economic output (the agriculture and development potential of that land). The loss potential in FAIR terms stems from both the intrinsic value of life and the socio-economic value that safe land provides to a community. In short, Asset = People and community benefits that are put at risk by residual explosives on the land.

- **Threat Event Frequency (TEF):** This corresponds to how often a threat agent acts against an asset. In the landmine context, the "threat agent" is the residual explosive hazard itself - e.g. an item of EO that was not found during clearance. Mines are not active agents in the way a hacker is; instead, the threat event would be someone encountering the mine. So, we can define Threat Event Frequency as the rate of hazardous encounters. Practically, this depends on factors like: How many items of EO might remain in the area (hazard density)? How often do people engage in activities that could disturb or trigger those items (e.g. farming, construction, walking)? For instance, if we estimate that there is 1 undiscovered mine left in a village's fields, and villagers collectively make 10,000 person-trips through those fields per month, TEF is related to the frequency with which a person's foot or plowing land might actually strike the hidden mine. Additionally, historical accident rates in similar areas can inform this. But sporadic incidents still occur, indicating a non-zero TEF even in "cleared" land. We might estimate, say, an expected encounter rate like "one contact with residual EO per 10,000 hours of land use." This can be challenging to quantify in low-data environments, but proxies and models (based on how many accidents occurred in the past per area and usage) can be used. As an analog to the FAIR model, Threat Event Frequency = How often people are likely to encounter any remaining EO on the released land (attempts per unit time).

- **Vulnerability (Prob. of Loss Given Encounter):** In FAIR, vulnerability is the probability that a threat event leads to a loss event. Here, given that a person encounters a leftover mine, what is the probability it actually detonates and causes harm? Mines by design have a very high likelihood of causing harm when triggered, but not every encounter guarantees an explosion. Some factors that might reduce vulnerability: the mine might be very old and its explosives degraded or fuse nonfunctional (so stepping on it may not detonate it), or the encounter might be indirect or categorically a different threat all together like air-dropped weapons. Generally, however, we assume a residual item of EO is lethal if interacted with. A conservative approach is to assume vulnerability is ~100% for direct contact - if a person steps on a functional anti-personnel mine, a loss will occur. For UXO, such as aircraft bombs or projectiles, the vulnerability could be considered lower if the population has been given Explosive Ordnance Risk Education (EORE). If needed, one could factor in Threat Capability vs. Resistance, analogous to FAIR's concept (e.g. a population given EORE material and content versus a population not exposed to EORE content or material).

  For simplicity's sake, Vulnerability in mine action = Probability that an encounter with a residual explosive hazard results in an explosion and injury/death. This could be less than 1 (to reflect some ordnance won't function or not every encounter is a direct trigger), but it will be relatively high for anti-personnel mines and some forms of cluster munitions. If data exist on what fraction of accidents involve devices that had been struck before without detonating, that could refine the estimate.

- **Loss Magnitude:** This represents the impact of a loss event. In a mine/UXO accident, the primary loss is typically measured in human terms: fatalities, injuries, and the associated suffering and economic cost or long-term economic loss of land being under-utilized. FAIR defines multiple forms of loss (Productivity, Response cost, Replacement, Reputation, etc.), many of which can be translated to this context:

  - *Primary Loss (direct):* This would be the immediate harm to the victim, their family, or economic return of the land. For a fatality, the loss can be quantified using the Value of a Statistical Life (VSL) - an economic estimate of the value society places on preventing a death. For an injury, one might use a proportion of VSL or medical cost and lost wages (though that often undervalues long-term disability). For example, if the VSL in a country or context is estimated at \$400,000, a death represents $400,000 in loss. Injuries could be, say, \$100k (for a serious maiming) in terms of medical expenses, lost productivity, and quality of life reduction. In the context of land this may be estimated by crop yields or economic output of a particular factory or area.
  - *Secondary Loss:* In FAIR this includes things like response costs and reputational damage. In mine action, secondary losses might include the cost of emergency response (medical evacuation, treatment) and follow-up clearance that will be conducted after an accident (if

a mine was missed, operations may have to return to re-clear the area - that cost can be considered). There is also a reputational or trust loss: the community may lose confidence in mine action results, and authorities could face anger and, almost certainly, liability claims. While hard to price, one could imagine a significant impact on the mine action program's credibility or on wider peacebuilding efforts if accidents were to occur post clearance. Additionally, a high-profile incident might reduce land values or investment in the region (similar to how FAIR's "reputation" loss works for companies).

- Considerations of Loss of economic output: If farmland is mined, people avoid using it, leading to lost production and diminished livelihoods. Once land is released, that lost opportunity is presumably restored - but if a residual hazard is present, people might still avoid parts of the land or, worst case, another accident could cause them to abandon it again. Thus, part of loss magnitude for an accident could include a renewed loss of livelihood for the community, if fear sets in. However, this can be considered in a scenario analysis (if an accident happens, do people stop farming the whole area?).

Loss Magnitude = the human and economic cost of a EO incident. We can quantify it by valuing lives (using VSL to include not just income but the inherent value of life) and adding other costs (medical care, loss of productivity, damage to infrastructure or vehicles, etc.). In low-data environments, one might use international benchmarks or studies - for example, a study in Cambodia derived a VSL around $0.4 million for rural villagers, which made clearance benefits much higher than when using just per capita GDP (Cameron et al. 2010).

The table below summarizes how the FAIR factors can be interpreted in the land release context:

Fair Component	Meaning in Information Security	Adaptation in Mine Action Context
Asset	Item of value (data, system) at risk	People's lives and limbs; community livelihoods and the safe land's utility (e.g. agriculture, housing) – essentially the population and socio-economic value relying on the cleared land.
Threat Event Frequency (TEF)	Frequency of threat actor attempts or events	Rate of potential mine/UXO encounters. How often someone might interact with a residual hazard (depends on residual contamination density and land use frequency).
Vulnerability	Probability that threat event -> loss event	Probability that an encounter causes harm. Given a person encounters a residual mine/UXO, likelihood it detonates and injures/kills. Typically high (a functional mine will cause harm if stepped on), though some uncertainty if devices are degraded or near-misses occur.
Loss Event Frequency (LEF)	(= TEF × Vulnerability) Expected loss incidents	Expected frequency of mine/UXO accidents on the released land (e.g. "0.1 accidents per year"). This combines how often encounters happen and how likely they are to result in casualties.
Loss Magnitude (LM)	Severity of loss per event (often monetary cost)	Consequences of a mine/UXO accident. Primarily human harm: fatality or injury valued via VSL or other economic proxies; plus secondary costs (medical response, loss of confidence, economic setback for community). Could be expressed in monetary terms (e.g. \$ per accident) or multidimensional (e.g. 1 death + \$50k property damage).
Primary Loss	Direct Loss of asset	Primary: Immediate victim's death or injury (and their direct economic loss).
Secondary Loss	Indirect Loss of asset	Secondary: Follow-on effects like emergency response costs, long-term care, community fear (leading to land being avoided again), and political/reputational effects for authorities.

By adapting FAIR's components in this way, we create a structured lens to examine risk on released land. We treat a released area and its returning community as the asset, the EO as the threat, and use frequency/probability estimates to quantify the chance of accidents and their impact. This does not replace the qualitative judgment of experts but complements it with a model that forces every assumption to be stated and, if possible, backed by data or at least logical reasoning from the operational/mine action operator's level up to the strategic/national level. In particular, it integrates well with the IMAS principle of using an evidence-based approach. Good information management will enable the FAIR analysis to estimate the likelihood of missing a residual item and the risk exposure of affected populations.

Quantifying Potential Loss: Economic Output and the Value of a Statistical Life

One of the most challenging aspects of applying FAIR in humanitarian contexts is quantifying loss magnitude in monetary terms, especially in post-conflict environments where reliable economic data might be sparse. However, doing so is crucial for cost-benefit analysis and transparent decision-making. Two useful metrics in this regard are Value of a Statistical Life (VSL) and economic output (GDP or income), which can serve as proxies for the benefits of risk reduction.

Value of a Statistical Life (VSL): VSL is an economic concept used to quantify the benefit of reducing the risk of death. It is not the value of one specific life, but rather the aggregated willingness-to-pay of individuals to reduce death risk in a population, normalized to one life. Developed countries often use VSL in the millions of dollars for regulatory decisions (for example, the US EPA might use \$10 million as VSL). In developing or post-conflict countries, VSL would usually be lower but it still far exceeds per capita income. In the context of EO clearance, studies have shown that using VSL dramatically increases the calculated benefits of demining. For instance, a contingent valuation survey in Cambodia (2010) found a VSL around $400,000 for rural villagers. By contrast, previous analyses that only counted lost income (in a very poor country) valued a life at merely a few thousand dollars (Cambodia's per capita GDP translated to $2,000 lifetime income). When applying the higher VSL, "humanitarian landmine clearance emerges as a more attractive ...policy" (Cameron et al. 2010) because the value of lives saved is an order of magnitude greater. In other words, incorporating VSL shows that investing in clearance to save lives is far more cost-beneficial than one would think if using more naive economic metrics. For residual risk quantification, VSL allows us to put a price on the expected casualties averted (or conversely, the expected cost of casualties if we do not mitigate residual risk further). For example, if residual risk in an area corresponds to an expected 0.001 fatalities per year and VSL is \ $400k, then the annual expected loss = $400k * 0.001 = \$400 per year. Such a figure can be directly compared to the annual cost of mitigation (like funding an EOD team or additional clearance) to inform decisions.

A challenge is determining an appropriate VSL for post-conflict settings. Conflict-affected populations might value risk reductions differently, and ability to pay is low. Nonetheless, studies like the one above provide empirical estimates. Alternatively, practitioners sometimes use global or regional VSL estimates or even the donor country's VSL as a perspective on the humanitarian value of a life saved. The key is to not undervalue human life by only counting concrete expenses. VSL implicitly captures intangible values - the pain, suffering, and social value of a life - which is why it is much higher than purely economic productivity measures. Although, it is accepted that assigning a monetary value to pain and suffering will never be perfect, it is an accepted component of assessing legal damages.

Low-Data Environments: Post-conflict settings often lack reliable statistics or accident reporting might be incomplete; population and income data might be outdated. One advantage of the FAIR approach is that it encourages us to use ranges and express uncertainty rather than avoid quantification altogether. We might say, for example, “the annual probability of an accident is somewhere between 0.1% and 1%” and “VSL is between $100k and $500k for this context.” Monte Carlo simulation can model these ranges and show possible risk distributions—e.g., $100-$5,000 annually with 90% confidence. This explicit approach is more useful for decisions than vague labels like “low risk.”

In the absence of local data, mine action organizations can draw on global research and analogies such as using VSL estimates from similar countries or generic figures recommended by the World Bank or other agencies for lower-income settings. Alternatively, mine incident rates from other regions or from historical trends could be used. For example, if a country had X accidents per year when Y square kilometers were left contaminated, one could extrapolate a rough risk per square km and apply it to the area being considered.

Quantifying loss in dollar terms with VSL and economic output connects the risk-analysis to policy and budget decisions. It translates the very real human and social impacts into the language of cost-benefit analysis that policymakers often need. By showing, for instance, that not clearing a low-priority area might statistically cost $5,000 in expected losses (because maybe one injury every 20 years) whereas clearing it fully would cost $500,000, a FAIR analysis can justify why resources were allocated elsewhere - or conversely, identify cases where residual risk is still high enough that additional clearance or risk education investment is warranted. The next section will illustrate this with hypothetical case applications.

Hypothetical Applications of FAIR in Mine Action Decision-Making

To demonstrate how the FAIR model supports transparent, data-informed decisions in mine action, we consider a couple of simplified hypothetical scenarios. These examples show how risk quantification could guide land release and post-clearance policies:

CASE 1: PRIORITIZING RESOURCES - CLEARANCE VS. RISK EDUCATION

Consider a country nearing the end of its national clearance plan. There are two provinces with some remaining suspect areas. Province A has known minefields in remote mountains that see little travel (e.g, leftover defensive minefields with no villages nearby). Province B is largely cleared but still gets occasional EO finds in farmland and villages (residual scattered contamination). Suppose there is only budget to significantly address one province this year.

Using a FAIR approach, one would estimate the annual expected accidents in each province under the status quo:

- Province A: 5 known minefields remain, each perhaps with dozens of mines, but very low traffic. Maybe one accident every 5 years statistically (0.2 per year) if left uncleared, given few people go there. If an accident happens, likely a casualty; say loss per event = $300k (VSL). So, risk is equal to 0.2 * \$300k = $60k/yr expected loss.

- Province B: No large minefields, but sporadic UXO (from artillery shells, etc.) cause on average 2 accidents per year (just by the nature of agricultural activity and kids picking up strange objects). With better risk education, maybe this could be lowered. Expected fatalities maybe 1 per year (since not every accident kills, but say one death and one injury per year on average). Using VSL \$300k for the death and \$100k for the injury, that's \$400k combined per year expected loss. If clearance teams are instead used to do additional sweep or rapid response in B, maybe they can remove many of these lurking items and cut accidents in half.

From a risk-analysis standpoint, Province B currently has the higher human cost (~\$400k/yr vs \$60k/yr). Even if Province A's minefields look scary on maps, if they aren't harming people now, they might be lower priority in terms of residual risk to population. FAIR analysis thus supports a prioritization to allocate resources to Province B - e.g. fund risk education teams, quick-response EOD call-outs, or surface clearance of high-use areas - because that yields a larger reduction in expected loss of life per dollar spent. Meanwhile, Province A's minefields could be marked and left for a later time when more funds are available. This quantitatively reinforces a principle sometimes voiced qualitatively: not all minefields pose the same level of risk, and some residual threats can be managed by methods other than immediate clearance.

CASE 2: LONG-TERM NATIONAL RESIDUAL RISK MANAGEMENT

After a country is declared "mine-free" (meaning all known hazards have been addressed), it enters the residual contamination phase. Policymakers must decide what capacity to maintain for the long term. Options might include:

(a) a standing national EOD team of, say, 50 personnel at cost \$X per year

(b) training local police/military to handle calls as they arise, or

(c) no dedicated team, handling it ad hoc (risky).

A FAIR-based approach can estimate the national residual risk: e.g., based on other post-clearance countries, perhaps there will be 5 residual EO discoveries per year and 1 accident causing a casualty every 2 years (0.5 per year). With VSL \$500k (using an international donor perspective), that's \$250k/yr expected loss. Now, maintaining a full 50-person capacity might cost say \$1 million/yr - which might be disproportionate if risk is\$250k/yr. Maybe a smaller team costing \$300k/yr could respond to most threats, reducing the actual accidents to near zero (not guaranteed, but assume effective). The analysis would weigh cost vs risk reduction. If a certain capacity can reduce that \$250k risk to \$50k (through speedy responses, public education to report items, etc.), spending up to \$200k would be justifiable in pure cost-benefit terms. This kind of rationalization helps explain to a finance ministry why a residual risk management program is needed even after "completion." Conversely, if a country cannot afford a large team, the analysis can help optimize what level of risk they're accepting. It's aligned with IMAS guidance that transitioning to residual risk management should be planned with information recorded to facilitate it - FAIR could be part of that information-driven planning.

These cases, while simplified, show how FAIR can make mine action decisions more transparent. By articulating the risk in financial terms, it allows all stakeholders - from technical operators to donors and government officials - to see the rationale. It connects humanitarian outcomes (lives saved, land released) to quantifiable metrics, supporting arguments for funding or for particular strategies.

It also highlights assumptions that can be debated: e.g., if a community feels the risk of one missed mine is absolutely unacceptable regardless of probability, that is a value judgment that goes beyond the analysis.

Conclusion

Humanitarian mine action has evolved from rigid clearance-for-certainty toward a more balanced approach that manages risk and resources. As the sector accepts that "no post-conflict environment is risk-free," there is a growing need for tools to better quantify and communicate residual risk.

The FAIR model—though developed for other domains—offers a compelling way to do this. By breaking residual risk into understandable components (e.g., likelihood, severity, affected assets) and attaching evidence-based values, FAIR helps translate abstract risks into actionable estimates. Policymakers and practitioners can then better assess when to invest further in mitigation and when risks are low enough to allocate resources elsewhere.

Applied to land release, FAIR bridges technical mine action standards with quantitative risk analysis. It aligns with IMAS and ISO 31000, reinforcing "all reasonable effort" by defining what is reasonable in cost-benefit terms. It also supports the transition to national ownership by helping states plan and justify residual risk management structures.

Importantly, FAIR uses economic valuation (such as VSL and economic output) to express risk in policy-relevant terms. This can attract government and donor support, particularly when resources must be prioritized across multiple public safety needs.

Numbers alone, however, cannot capture the full human cost or fear associated with EO. Humanitarian values and legal obligations, like the Mine Ban Treaty's call for zero tolerance, remain essential. FAIR does not replace these commitments but helps to implement them more effectively by identifying where the greatest residual risks remain and where additional effort saves the most lives.

In closing, FAIR would enhance transparency and accountability in mine action by answering the crucial question: after clearance, how safe is safe enough? Through detailed analysis and quantification, it supports informed decisions that maximize harm-reduction, and guide prioritization. This helps to ensure that, donors, governments, affected-communities and mine-action practitioners can transparently analyze the residual risks posed by humanitarian mine action.

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