

More than economics: building psychological, social and cultural capital in communities to support transition to the next use of a former mine site

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Abstract

Discussion on the community impact of mine closure often focuses on economic issues such as loss of jobs, but other impacts can also be significant. These include psychological impacts (e.g. feelings of hopelessness, grief, loss and isolation), social impacts (e.g. disruption to community, family and social networks) and cultural impacts (e.g. changes to identity, traditions and ways of life). The way in which these impacts are addressed strongly influences the likelihood of success in agreeing on and transitioning to the next land use for a former mine site. This is difficult as these impacts are often complex, dynamic and hard to measure or quantify, but should not be ignored, particularly where there is opportunity to intentionally create a place that has meaning and attachment for community, and instils pride and hope for the future.

Key to managing and even preventing these impacts is intentionally building psychological, social and cultural capital with the same deliberate effort that companies put into building other forms of capital such as financial, political or natural capital. However, there seem to be limited processes for this, indicating that new approaches and tools are needed. These are particularly important in ensuring that the 'left behind' communities (i.e. communities that exist following cessation of mining) are not left behind when defining post-mining land uses and other aspects of closure planning.

Processes and tools associated with futures thinking can meaningfully involve communities in designing their future, increasing resiliency and strengthening the likelihood of transition success. This paper describes how tools such as the Futures Triangle can be used in:

- *Selecting post-closure land uses based on a shared understanding of the significance of the past, the push of present and the pull of future.*
- *Developing the psychological, social and cultural capital needed to enable transition of a former mine site to future community use.*

The conceptual simplicity, flexibility and adaptability of the Futures Triangle have supported its application across diverse domains and sectors including infrastructure, agriculture, tourism and healthcare as well as mining and industrialisation. However, it seems that it has not previously been used in relation to mine closure and post-closure transition. Consequently, this paper likely represents new thinking in the closure space.

Keywords: *post-mining land use, community impacts, community transition, stakeholder engagement, psychological capital, social capital, cultural capital, futures thinking, Futures Triangle*

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1 Introduction

The mining industry has long understood that its strategies, processes and outcomes are more likely to be accepted, effective and sustainable if they fulfil the various needs of stakeholders, and that this will not occur if decisions and interventions are detached from the social context (Panzarella et al. 2023). This is particularly relevant when selecting the next land use(s) for a former mine site as this profoundly affects the legacy that a mining company leaves when it ceases operations and the company exits the region (Worden et al. 2024; Selame & Simpson 2025). However, contemporary mine closure planning tends to focus primarily on functional aspects such as safety, physical stability, chemical stability, ecological stability, risk limitation, cost-effectiveness and long-term care (International Council on Mining and Metals [ICMM] 2025a). Even when closure planning addresses socio-economic issues, this tends to have a primarily economic focus to enable a smooth transition through regional economic diversification. This focus on function in contemporary guidance misses the importance of how communities experience mine closure and transition, and how this affects the sustainability of the next land use and associated closure outcomes. However, there is growing recognition that the social dimensions of mine closure are critical if the mining industry is to avoid negative mining legacies that “leave behind mine towns with unclear futures, depressed local economies, degraded landscapes, and costly liabilities” (Unger et al. 2025).

As the social dimensions of mine closure are not systematically or widely addressed in government regulations or industry guidance, currently the onus is on the mining company to use inclusive, transparent and justice-based frameworks, processes and tools that support meaningful community participation and allow community members to be active agents in shaping their futures (Svobodova et al. 2025). Building processes and tools from the ground up can take considerable resources so applying or adapting existing frameworks, models and other tools makes sense, even if these were developed for other sectors or purposes. For example, the Five Capitals Framework was originally developed in 2005 to assist companies in assimilating sustainable initiatives in their management practices to achieve value maximisation (Oblakovic et al. 2023), but has now been used to reflect community aspirations in regional post-mining assessments (Worden et al. 2024) and to rank options for post-mining land uses (Cote et al. 2023). Further, the Community Capitals Framework was developed to inform decision-making in relation to community development (Mueller et al. 2020), but has since been used to assess the environmental impacts of mining (Kanakakis et al. 2018) and in determining how local assets may inform the remediation and transformation of contaminated sites (Panzarella et al. 2023, 2025a, 2025b). More recently, Finucane (2024) discussed how the Community Readiness model, which was initially developed for the health industry and has since been applied to the transportation sector, could be used in mine closure planning, while Bowden et al. (2025) outlined the benefits of applying futures thinking to mine closure and transition, highlighting the role that participatory futures methods can play in supporting communities to explore or shape futures.

Building on the concepts presented in Bowden et al. (2025), this paper further discusses how processes and tools associated with futures thinking can meaningfully involve communities in designing their future, increasing resiliency and strengthening the likelihood of transition success. It commences with discussion on the importance of community involvement in selecting and implementing post-closure land uses that will support a community’s aspirations for its future, then discusses the importance of building psychological, social and cultural capital within communities to address the psychological, social and cultural impacts of mine closure and sustain post-mining land uses. Finally, in recognition that hope for the future and belief in their collective agency allows communities to progress towards more positive futures (ICMM 2025b), this paper discusses the way in which futures thinking can be used to enable mining communities to envisage long-term (post-closure) goals, identify different ways to achieve those goals and build their resilience by increasing comfort with change and uncertainty.

2 Transforming mining spaces into places for community use

2.1 Ensuring that ‘left behind’ communities are not left behind in planning for next land use

Typically, mining companies aim, or are required, to rehabilitate mined lands to achieve a safe, stable and non-polluting condition that supports an agreed post-mining land use. In Australia and many other countries, this is usually specified in a mine closure plan for which regulatory approval needs to be obtained before closure works can be implemented. It is common for mining companies to aim to return sites (as much as possible) to the land use that existed prior to mining. For example, companies often attempt to return pastoral lands to a pastoral land use, farmland to agricultural land uses, bushlands to bushlands, and so on. However, other potential land uses can be explored with a view to maximising social, economic and environmental closure outcomes.

The process for identifying options for post-mining land uses and then selecting the preferred use(s) is driven by many factors, including stakeholder expectations (Selame & Simpson 2025). In addition to shaping post-mining land use plans, early and sustained stakeholder engagement will strengthen local support for these plans and build trust between the mining company and stakeholders. Further, it increases the likelihood that the next land use of a former mine site will reflect the values and priorities of mining-affected communities and enables delivery of meaningful and achievable closure outcomes (Hood et al. 2025). These include opportunities for community use as showcased by Pearman (2009), Finucane & Tarnow (2019) and Whitbread-Abrutat & Lowe (2024).

Opportunities for post-mining land uses vary between sites and across jurisdictions, but it is not surprising that those regions in which post-mining creativity and innovation are most prevalent are those where industrialised mining has been occurring the longest (Whitbread-Abrutat & Lowe 2024) and that these opportunities are more likely to exist where mines occur in close proximity to population centres (Finucane & Tarnow 2019). However, if local communities are excluded from mine closure and rehabilitation planning and processes, then closure goals and community aspirations could be misaligned and the next land use for a mine site may not be sustainable. Consequently, it is important not only to engage communities in selecting the next use(s) of a mine site following cessation of mining, but to ensure that they have the right forms of capital to sustain these uses. These include psychological, social and cultural capital, as discussed in Section 3.

2.2 From functional spaces to meaningful places

As mentioned in Section 1, mine closure planning is currently predominantly focused on functional questions related to the future of the mine site or to the future of communities that are connected to the mine. For example, ICMM (2025a) outlines eight standard closure principles that cover physical stability, chemical stability, socio-economic transition, ecological stability, risk limitation, cost-effectiveness and long-term care. These principles relate to function and are mostly focused on the land’s stability and safety, and reducing risk to an acceptable level, with community transition approached through the frame of how to enable a smooth economic transition for the affected region through economic diversification. However, ICMM (2025b) recognises that “less visible variables, such as a sense of purpose and pride of place, can have a significant impact on how communities cope with transitions” and acknowledges that “the intangible aspects of socio-economic transition can often be overlooked as the focus tends to favour more concrete issues that are readily observed, measured and addressed.”

The functional principles described above are without doubt important and essential for closure planning. However, the focus on function can result in the human need for meaning being overlooked in the planning process. Humans are meaning-seeking creatures; indeed, it has been argued that the search for meaning is the primary motivation in human life and that our need for meaning comes from our unique capacity for foresight – that we can plan for a distant future, not just our present needs (Gärdenfors 2024). Therefore, meaning and the human process of collective meaning-making must be considered equally as important as functional considerations in mine closure planning to facilitate a successful social transition.

It is easy to fall into the trap of thinking about a mine site as simply a temporary use of land that results in a 'hole in the ground' to be filled or an area of disturbance to be 'fixed' once mining ceases. However, for many mining communities, the space occupied by a mine site is imbued with meaning. People feel a connection and an attachment to a mine, and a sense of belonging is created around it. Often, they have gone there every day for years to do their work and during that time they have possibly had children, formed friendships and built their lives around the mine. In this sense, the space is a 'place' that has a past, a present and a future.

The concept of 'place' has emerged as a relevant consideration for mine closure planning in recent years. For example, Whitbread-Abrutat (2025) defines 'place' as "space with attributed meaning derived from human emotions, experience, culture or memory", and explains that "meaning derives from social interplay, cultural practices, spiritual connections and historical happenings interacting with our natural and built environment, leading to a layered narrative that is embedded in the landscape and informs and influences current perceptions". He argues that "respecting and engendering the sense of place should be recognised as essential to a just transition", and that "it is time for industry guidance and practice to elevate sense of place as a core design principle". Svobodova et al. (2023) state that sense of place plays a critical part of the place-making process that comprises 3 interconnected components: people's feelings about the place, their activities related to the place, and place characteristics as perceived by people. These authors argue that a sense of place and related cultural identity are particularly strong in places where a mine is germinal to a community's origin story so the psychological, social and cultural impacts associated with the loss of these when a mine closes can be significant. These impacts are discussed in Section 3.

If the mining sector is serious about taking communities' perspectives into account in mine closure and transition planning, it needs to shift from seeing closure and transition in primarily functional terms to seeking to understand and engage with the meaning that mining sites have as 'places' for communities.

2.3 Engaging with place

Regarding mines as places adds layers of complexity to mine closure planning as it requires the consideration of many new elements beyond the technical and economic. These include the less tangible psychological, social and cultural dimensions such as human emotions, culture, identity, experiences, memory, stories, spiritual connections and relationships.

Humans are social beings who construct and make sense of the world through language. Language, and thus meaning-making, is a dynamic social process through which we create our worlds, and the meanings and understandings we attribute to them (Anderson 2023). Consequently, engaging effectively with the psychological, social and cultural dimensions in the transition process requires commitment to conversational processes that allow meaning to be discovered and expressed.

Mining companies need to understand community connection to land before they can identify and select land use options. The perspective of place moves the focus of post-mining land use planning from one in which managing risk by making the land safe, stable or non-polluting is of utmost importance to achieving a positive legacy by selecting and enacting a post-mining land use that honours a community's connection to place and supports their aspirations and future vision for the community and the place.

Deep engagement with communities to understand what a place means to them increases the likelihood that the next land use of a former mine site will reflect the values and priorities of communities with connections to the site. This in turn increases the likelihood of a successful post-mining transition that supports communities with a continuing sense of connection to place, community cohesion, and trust and goodwill towards the mining company. All these less tangible elements of transition create the foundational conditions in which the functional aims of a safe, stable and non-polluting site and a successful economic transition can be achieved.

2.4 The ongoing process of place-making

Activities associated with the construction, operation, closure and post-closure phases of a mine impact both space (how the land is used) and place (the meaning that people attach to the land). A place is never complete – it is in a constant process of ‘becoming’ as people live in it, experience it and attach meaning to it, all of which change over time. Therefore, place-making (and place re-making) is intentional engagement in this process as the community comes together to think about their long-term future and how to create it.

When a mine opens, prior socio-cultural and material landscapes can be disrupted and may even be erased, and community identity can undergo significant modification. This forces communities to revalue and reconnect with these places, leading to place re-making as mining communities develop and connect with the mine (Svobodova et al. 2023). Other changes to socio-cultural and material landscapes occur during the operation of a mine, further altering the connections and interactions between people and place, and generating new ones as mining proceeds (Whitbread-Abrutat 2025). The closure phase may provide an opportunity for further place re-making that enables people to collectively reimagine, reinvent and physically reconnect with the mine site. This requires the same social, political and material processes as place-making, but now framed by the long-lasting consequences of the disruption (Svobodova et al. 2023).

Community and their feelings about place are neither homogenous nor static. The meaning attached to the place will differ between individuals and sub-groups of the community and will change over time. Closure planning needs to be cognisant of, and responsive to, these aspects. A post-mining land use selected at an early stage in a mine’s life may reflect the meaning that the place has for the community at that time, but values, attitudes, opinions, culture, identity, connections, stories and emotions about a place will inevitably change over the long life of the mine. Therefore, the originally proposed post-mining land use may no longer be relevant at the time of closure. When looked at in this way, mining companies can reframe closure as an ongoing process of place-making that begins from the moment the mine opens. When they think about how they are constantly contributing to creating a ‘place’ throughout the life of the mine, decisions related to closure (and post-mining land use) become smoother. That is, if a place is intentionally and continually being created throughout a mine’s life, then closure will just be another intentional phase in the ongoing process of transition rather than a major psychological, social and cultural ‘before and after’ cleavage or rupture that requires significant adjustment. In recognising that there is more to a place than the mine itself, the sense of place is not fundamentally disrupted when the mining activity ceases. It simply continues to evolve, without the mine.

Of course, place-making is not something that a mining company can do to, or for, a community. Places are made by the communities who are connected to them by the things they do every day to make it a place. Mining companies can assist this process through their ability to shape the physical environment. Further, by helping build the psychological, social and cultural capital of the community, they can create in the community the capacity to constantly and intentionally create their place.

3 Developing psychological, social and cultural capital to address community impacts of closure and enable post-mining transitions

3.1 Why do mining communities need psychological, social and cultural capital?

The way in which communities are affected by mine closure is multidimensional and the scope and severity are likely to vary between mines and across regions. The impacts may be direct or indirect, could appear immediately or emerge over time, and may differ in duration, visibility and magnitude (Jiskani et al. 2026). They are often assessed collectively under the banner of socio-economic impacts, but it seems that the focus of these assessments tends to be more on economic impacts and transition than other impacts of mine closure such as psychological, social and cultural impacts, despite the significance of these effects. This may be because psychological, social and cultural impacts can be complex, dynamic and difficult to measure or quantify, but the importance of intangibles should not be ignored (ICMM 2025b), particularly where there is

opportunity to intentionally create a place that has meaning and attachment for community and instils pride and hope for the future and can significantly affect how communities cope with post-mining transition.

Improving our knowledge and understanding of psychological, social and cultural impacts, and having the right tools in place to assess and manage them, are critical if we want to support more informed discussions about the mining industry's impacts and contributions, have better conversations about the future of communities, ensure successful transitions to the next land use for a former mine and sustain communities post closure.

Key to managing and even preventing these impacts is intentionally building psychological, social and cultural capital with the same deliberate effort that companies put into building other forms of capital such as financial, political or natural capital. Building psychological, social and cultural capital within the community creates a store of useful assets and advantages that supports community resilience (ICMM 2025b) and can be used to sustain agreed post-mining land uses.

Sections 3.2–3.4 discuss the psychological, social and cultural impacts and the importance of building psychological, social and cultural capital.

3.2 Psychological impacts and capital

Psychological impacts associated with mine closure include feelings of shock, loss of hope, pain, shame, embarrassment, abandonment, despondency, isolation and despair (Duffy & Whyte 2017). These impacts can be significant, with Jiskani et al. (2026) identifying mental health issues stemming from economic hardship and community decline (such as depression and substance abuse) as one of 4 main barriers to successful post-mining transitions due to their effects on community cohesion, conflicts, cultural stability and wellbeing. These issues not only cause personal suffering, but also weaken community resilience and limit communities' ability to embrace new opportunities (Jiskani et al. 2026).

To guard against feelings such as hopelessness, despair and abandonment at closure, mining companies can, across the life of the mine, engage in activities and conversations that proactively promote hope, efficacy, resilience and optimism within individuals who make up the community. Together, these 4 healthy psychological resources make up psychological capital and enhance wellbeing and performance (Luthans & Youssef-Morgan 2017).

Feelings of shock, which are essentially a response to surprise, can largely be prevented by talking clearly about mining as a temporary activity in the landscape and having optimistic conversations about the future of the community beyond the life of the mine. While time frames may not be known, mining companies can keep the community informed about their decision-making processes, especially once time frames become clear.

All change and transition, even those considered to be positive, involve feelings of grief as we let go of the past. While many people try to avoid it, grief has an important function during times of change. It helps us let go of what was so that we can attach to what is to come. Consequently, it is recommended that mining companies plan for and address grief responses to support healthy processes of transition.

3.3 Social impacts and capital

Mine closure can disrupt social cohesion and established community dynamics (Bainton & Holcombe 2018; Kanakis et al. 2018). Such disruptions can trigger interlinked social stressors such as increased crime, depression, poverty and outmigration, as documented by Siyongwana & Shabalala (2019) in relation to the closure of a gold mine in Mpumalanga Province, South Africa. Affected workers and communities often lack the skills and resources to transition to sustainable livelihoods, intensifying social as well as economic vulnerabilities, and gendered impacts can be pronounced (Sesele et al. 2021). Demographic decline and reductions in public services such as healthcare and education can further exacerbate social repercussions (Bainton & Holcombe 2018).

According to Jiskani et al. (2026), 2 of the main barriers to post-mining transition are community fragmentation and community conflict. Community fragmentation occurs when closure disrupts social ties and networks established during the mining life cycle, undermining unity and collective capacity. Mine closure can contribute to community fragmentation if the process results in polarisation, erosion of shared values and reduced trust. By comparison, community conflicts are often linked to job losses, economic uncertainty or unfulfilled company obligations, and can deepen existing tensions or can trigger new disputes (Jiskani et al. 2026).

Social capital may be a helpful concept for mining companies when trying to minimise negative impacts on social connections and networks within communities and potentially strengthen them. Social capital theory has been receiving increasing interest in recent years and while there is no agreed definition of social capital (Claridge 2020), the commonality of most definitions is that they focus on social relations that have productive benefits.

A distinction has been made between structural, cognitive and relational social capital (Nahapiet & Ghoshal 1998, in Claridge 2018). Structural social capital relates to social structure and includes network ties, roles, rules and procedures. Cognitive social capital relates to shared understandings and includes shared language and narratives, shared values, attitudes and beliefs, and shared goals, purpose and vision. Relational social capital refers to the nature and quality of relationships and includes trust and trustworthiness, norms, expectations, obligations and identity.

Mining companies can work with local stakeholders such as local government, community groups and Indigenous organisations to understand community connections prior to mining as well as how to support them. They can also work with these stakeholders to identify strategies to meaningfully integrate the new mining community with the existing community while not creating dependencies. Mining companies can explore community values, attitudes and beliefs, and support the community in developing shared goals, purpose and vision.

Mining companies can actively focus on processes that develop strong relationships within the local community. They can help communities understand who they are (and what their identity is) before, during and after mining activity. They can foster a sense of trust within their local community and actively intervene to improve trust where they can by creating conditions within the community that support openness, flexibility, reliability, cooperation, compromise, empathy and forgiveness. Rather than ignoring community conflict or relational breakdown, mining companies need to bring fractures into the open and facilitate processes of repair where appropriate.

3.4 Cultural impacts and capital

Mines are often deeply tied to local identity, history and social structures. When they close, there can be significant cultural impacts, including changes to identity, traditions and ways of life, loss of meaning and loss of connection to history and origin stories. When a community attaches its identity strongly to a mine, it can be devastating and frightening when the mine closes. It can raise existential questions of ‘who are we now?’ and ‘what is our purpose?’. In addition, the earthworks and demolition involved in removing mining infrastructure can have a deleterious effect on local cultural heritage by disturbing either tangible monuments or the social practices associated with them (Martin 2025). Further, cultural erosion and change can be barriers to successful post-mining transitions (Jiskani et al. 2026).

When a mine is central to a community’s origin story, sense of place and related cultural identity tend to be particularly strong (Whitbread-Abrutat 2025) and place attachment develops (Svobodova 2019). For example, when coal jobs started to decline in the Ruhr Valley, Germany, it was stated:

“Dying industries take more than jobs with them. Towns built around a single industry, like coal mining, develop a shared identity. For many workers and their families, it’s not as simple as picking up and finding a new line of work when the mine closes. Mining is seen as a calling, an inheritance, and people want their way of life back.” Urry (2017)

The concepts of social capital and cultural capital are similar and overlap in many ways. Social capital can be thought of as being about individual relationships and relational properties, with cultural capital extending beyond this to the wider social context of social organisation (Claridge 2022). A recent review of community development literature found that cultural capital can refer to creative industries and amenities, a distinct social group, place-based characteristics, a form of social power or knowledge, values, attitudes, norms and beliefs (Hale et al. 2023).

We conceptualise cultural capital as creating a cultural identity or ‘community spirit’ by building knowledge, skills, education, connection and attachment to place (physical, emotional and spiritual) (Whitbread-Abrutat 2025), memory creation and other beneficial cultural traits. Community-led initiatives are key to renewing cultural heritage post closure (Svobodova 2025), but there are numerous ways in which mining companies could assist in building cultural capital during construction and operations, many of which could be sustained post closure. The list provided below has been adapted from Hale et al. (2023) and Svobodova (2025):

- Preserving local stories, history, food, art and architecturally important buildings.
- Providing recreational and social opportunities within the community.
- Supporting the continuing beliefs, knowledge, traditions, language, values, norms and practices of particular groups such as Indigenous communities.
- Mapping and conserving cultural landmarks to ensure that they are preserved as part of the post-mining land use.
- Restoring or symbolically reinterpreting lost landmarks to foster a sense of place and social cohesion.
- Ensuring cultural capital does not create power imbalances and inequities in the community.
- Adopting a stance of cultural humility, relinquishing their position as ‘expert’ and developing non-paternalistic collaborations with communities.

It is also recommended that mining companies considered whether and how they can contribute to protecting or building ‘cultural anchors’ in the community, particularly those that will be important in sustaining a community post-closure. In this context, a cultural anchor can be thought of as “a core belief, tradition or practice that provides a community with a sense of stability and identity during periods of rapid change. These anchors help people transition to new ways of living without losing their social cohesion” (Sustainability Directory n.d.). Cultural anchors can also include landscape features which can be small (such as trees or rock formations), but which serve as spiritual anchors, points of local identity or community memories (Svobodova 2025).

Mine closure marks a transition rather than an ending so it is important that mining companies work with affected communities to ensure that mine closure planning is cognisant of local identities, lived histories, intergenerational knowledge and community aspirations, and enhances cultural resilience. For example, restoring or symbolically reinterpreting lost landmarks can foster a sense of place and social cohesion post-closure, with these sites potentially evolving into hubs for cultural exchange and education that support social regeneration (Svobodova 2025).

4 Futures thinking and mine closure

4.1 What is futures thinking?

Futures thinking is not just about how we think about the future. It is also about the process of working with other people to create new and different futures. It helps people to see different perspectives, generate useful ideas about the future, imagine possibilities and create meaning in individuals and groups.

In his seminal futures work, Polak (1973) argues that the factors determining whether a group will prosper or decline are the existence of a positive image of the future and a belief in the group’s agency to achieve

that vision. Groups with a positive image of the future and belief in their collective agency progress towards more positive futures, while those without decline. ICMM (2025b) identifies ‘hope for the future’ among the intangible community-level elements of socio-economic transitions, highlighting the risk of despondency and mental health problems if the post-mining future looks bleak.

Futures thinking can be used to actively build hope, a learned thinking pattern which manifests in observable behaviours in groups of people (Snyder et al. 2002). Hope reflects people’s perceptions of their capacity to clearly conceptualise goals, develop strategies or pathways to reach those goals, and initiate and sustain motivation to use those strategies. Through conversational processes, futures thinking enables groups of people to envisage a hopeful long-term future, i.e. one that they want to create (goals), helps them to identify multiple different ways to get there (strategies/pathways), and builds their resilience by increasing comfort with change and uncertainty. Using futures thinking processes helps groups overcome feelings of powerlessness and helplessness in the face of change and find the motivation to engage in collective action to create better futures (Sardar 2013).

There are many participatory futures methods that can help navigate the changes associated with mine closure and transition and develop effective strategies for the future of communities and place. These methods are selected based on the question being asked about the future and include use of the Future Triangle.

4.2 The Futures Triangle

The Futures Triangle is a strategic foresight framework that allows communities and organisations to understand the dynamic forces that shape their future. Developed by futurist Sohail Inayatullah (Inayatullah 2007, 2008), this futures thinking methodology maps 3 competing factors to determine how the future can unfold. These are the pull of the future, the push of the present and the weight of the past (Figure 1).

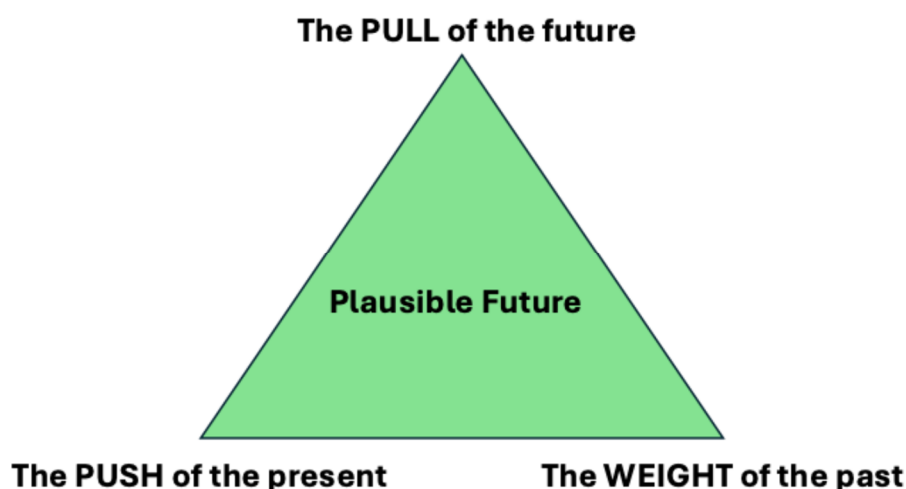


Figure 1 The Futures Triangle (adapted from Inayatullah 2008)

Unlike linear forecasting models, the Futures Triangle recognises that ‘tomorrow’ emerges from the tension between these 3 forces (Hindin 2025), which are defined as follows:

- The ‘pull of the future’ represents an organisation or community’s vision, aspirations and desired outcomes, and draws them forward towards preferred possibilities. Relevant forces include stakeholder aspirations and dreams, transformational goals and emerging opportunities (Hindin 2025).
- The ‘push of the present’ encompasses the contemporary forces that are currently driving change. These include the trends, technologies, developments and decisions happening ‘today’ that will

shape 'tomorrow'. Examples of present push forces include leadership decisions and strategic initiatives, regulatory changes and policy shifts, social movements and cultural changes, and technological innovations and digital transformations (Hindin 2025).

- The 'weight of the past' represents structural barriers, resistance to change and historical inertia. These forces can include contractual obligations, regulatory frameworks and compliance requirements, historical relationships, stakeholder resistance and change fatigue, and can create an anchor to familiar patterns and slow transformation (Hindin 2025). Inayatullah (2023) notes that while the 'push of the present' is seen as an enabler, the weight of history is seen as a barrier to change especially by those that are business-minded.

The conceptual simplicity and methodological flexibility of the Futures Triangle have supported its application across diverse domains and sectors (Wahab et al. in press). For example, it has been used to inform long-term planning for infrastructure such as Melbourne's 50-year sustainable sewerage strategy (Fam et al. 2014), groundwater management in Tunisia (Hassenforder et al. 2024) and agriculture in Sub-Saharan Africa (Oberholster & Adendorff 2019) along with residential planning (Avila-Calle et al. 2022), tourism (Lehmann, 2023) and healthcare (Riggs 2024). Within the resources and mining industry, the Futures Triangle has been used in relation to mining in Afghanistan (Sheraz 2014) and industrialisation (Sheraz 2010). The breadth of these applications underscores the adaptability of the Futures Triangle, but it seems from our review of published and grey literature that it has not previously been used in the context of mine closure and transition. However, we envisage that, as a simple conversational futures method, the Futures Triangle can help with the transition challenge of building connections between people of the pre-mining place with the post-mining place (Whitbread-Abrutat 2025), can help groups develop plausible futures and make informed decisions, and can support the development of effective strategies for the future of communities.

The Futures Triangle can be used as a stand-alone method or in conjunction with other foresight tools (Inayatullah 2023). These include backcasting (a foresight evaluation technique that starts by imagining a future where goals and strategic objectives have already been achieved and working backwards to identify the steps necessary to achieve these) and wind tunnelling (a method that allows stress-testing strategies against a range of alternative futures or scenarios) (Krishnan et al. 2022). See Krishnan et al. (2022) for further information.

Use of the Futures Triangle in identifying post-mining land use options and in building psychological, social and cultural capital is discussed in Sections 4.3 and 4.4.

4.3 The Futures Triangle and post-mining land use option identification and selection

Before a mining company can engage a mining community in conversations about identifying and selecting options for post-mining land use(s), it needs to understand community connection to land, including Indigenous connection to land. The Futures Triangle method can be used to structure and facilitate conversations that explore a range of aspects of the past, present and future of a mine site/place. Examples of questions that might be explored in such conversations are provided in Table 1.

Table 1 Futures Triangle questions

Factor	Questions
Past	Why is this place important? How is this place significant? How has the land been used? By whom? What was here before mining? What has been the relationship of people to the land? How has people's relationship the land been impacted by mining? What is the miner's reputation? What does it mean to be a 'steward' of what has gone before? What needs to be honoured? What needs to be repaired or restored?
Present	What is happening in the community now? (social, political, economic, spiritual) How is the land being used now? Who has power? Authority? Influence? What relationships exist? Between sub-groups of the community? Between government and community? Between miners and community? Where is there existing conflict in the community? How does the community perceive mining? How does the community perceive the miner?
Future	What do we want to create together? What futures give us energy and hope? What do we want to avoid? What will our legacy be?

The Futures Triangle provides an accessible way of tapping into 'local wisdom' to inform post-mining land use selection. Communities have insights and a wealth of knowledge and experience applicable to every facet of mine closure planning and implementation that not only includes lived experience of the mine's social, cultural, and economic impacts, but also a deep, place-based understanding of local ecological systems and land use practices (Bainton & Holcombe 2018; Svobodova et al. 2019, Svobodova et al. 2025). Excluding or ignoring this knowledge increases the risk that the next use of a mine site will not be accepted or that an agreed post-mining land use will fail to achieve the expected outcomes and benefits. By comparison, incorporating this knowledge enhances the relevance, effectiveness and long-term success of closure and rehabilitation strategies and plans (Alonzo et al. 2024; Svobodova et al. 2025).

Through Futures Triangle conversations, communities, mining companies, regulators and other stakeholders can develop a shared understanding of the significance of the past, change factors in the present and plausible visions for the future. Based on the definitions provided in Section 4.2, the following comments are offered in this context:

- The past: the history of the place and its significance for community over time. This includes understanding the 'weight' of the past that can shape what is possible in the future, including both 'burdens' of the past to put down or let go of, and 'responsibilities' to carry forward and continue. For example, letting go of the community identity as a mining town and carrying forward Indigenous culture and practices.

- The current state: what is happening in the community and place now and what needs to be created. The ‘push’ of the present includes change factors that provide opportunities for the future and change factors that represent risks for the future. By identifying these factors, communities can develop strategies to capitalise on the opportunities and manage or counter the risks. For example, the winding down of the mine site and the risks that poses to job security, and the broader social interest in mining history and the opportunity that presents for tourism.
- The images of the future for this community: what this community wants to become or wants to avoid. Images of the future pull communities in certain directions by providing energy and motivation either through the hope of a future to which communities are attracted or the fear of a future that they want to avoid. For example, a future with a vibrant, secure and inclusive community compared to a future where shops and pubs close, families move away and disharmony exists between remaining sub-groups.

This shared understanding can assist mining companies, together with the community, in selecting post-mining land use options and developing aligned plans and strategies that will support the community’s aspirations for the future of their place.

4.4 Using the Futures Triangle to build psychological, social and cultural capital

The Futures Triangle method can build the community’s capital to be able to engage meaningfully and constructively in conversations about their future that result in new perspectives, insights and understanding.

At the psychological level, the process is a source of energy, hope, motivation, inspiration, ideas, new connections or reframed understanding. Other important emotional benefits for participants may include a sense of satisfaction or relief at being given the opportunity to share their perspectives and the experience of being listened to. People will be more open to different ideas and options for post-mining land use(s).

At the level of social capital, this process can help mining companies build relationships and trust with community members and stakeholders, as well as support the development of relationships and trust within the community. Open, trusting relationships and an understanding of the generative nature of constructive conflict can support communities to have robust conversations about different post-mining land use options.

The stories that emerge from the process of considering the past, present and future are a form of cultural capital. This capital can help the community through the post-closure transition by providing stories around which community can be rallied or identifying or highlighting cultural anchors that can be sources of pride and meaning. Post-mining land use options can be identified that support and enhance the culture of the community.

5 Conclusion

To transition mine sites to post-mining land uses that will allow communities to thrive, mining companies need to move beyond thinking about closure and land use planning predominantly through the lenses of environmental and economic function, and make questions of meaning a central part of their approach to closure. By engaging communities in open, curious and generative conversations about place from the beginning of a mine’s life, mining companies can become trusted partners with communities in the ongoing process of place-making. Further, by working with communities to explore the concept of place through the prism of the past, present and future, companies can collaboratively identify and select post-mining land use options that are aligned with the community’s physical, emotional and spiritual connections to place. Through this process companies can support communities to build the psychological, social and cultural capital that will provide them with the agency and resilience needed to create positive post-mining futures for the long term.

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