

Urban Sustainability Management Frameworks

The background, with a focus on culture and heritage

Urban sustainability management frameworks that aim to support communities as they progress along the path to sustainability received a major impetus with the recent publication of the ISO 37101 sustainability management for communities international standard [1] and the World Bank - Global Environmental Facility *Urban Sustainability Framework* (USF) guide [2]. To ensure a human-centred, inclusive and equitable development these frameworks also aim to support the Sustainable Development Goals (SDGs) and the New Urban Agenda that place culture at the heart of development policies.

The ISO 37101 purposes - action areas matrix

The ISO standard and to some extent the USF guide build upon established management system standards such as those for quality and environmental management. However, they break new ground by introducing new concepts for what many would consider to be technical standards for management best practice. The main new concept is to articulate sectoral requirements across various areas of action. Central to ISO 37101 and mirrored in the USF are areas of action upon which a community can act to achieve the purposes of sustainable development.

Action areas	Purposes						
	Attractiveness	Environment	Resilience	Resources	Cohesion	Well-being	Enablers
Governance							
Education							
Innovation							
Health							
Culture							
Cohesion							
Economy							
Environment							
Security							
Infrastructure							
Mobility							
Ecosystems							

Fig 1: The ISO 37101 framework of community sustainability management purposes and action areas with the Urban Sustainability Framework’s “Enablers” purpose added. The significance of the coloured cells is explained below (see Optimised SDG-Compatible Disclosures).

Areas of action are easily interpreted as programmes of actions carried out or “levers” that are used in order to “achieve” sustainable development or to deliver outcomes that impact, affect, influence or have an effect on sustainable development [1]. ISO 37101 action areas are given abbreviated titles in

Fig 1. ISO 37101 specifies to some extent criteria that should be used to identify actions that should be grouped into action areas. In brief, actions must be relevant, significant, under the community's authority, resourced, measureable, and feasible.

Purposes are generally interpreted as the objectives of sustainable development [1] but are also referred to as outcomes, outputs, achievements, contributions, or value brought to sustainable development. ISO 37101 purposes of sustainable development are Attractiveness, Preservation and Improvement of the Environment, Resilience, Responsible Resource Use, Social Cohesion, and Well-being (see Fig. 1).

A common framework

The USF effectively adds a seventh purpose namely enabling contributions, or “Enablers” for short, that mainly groups fiscal sustainability, governance and planning. As for the other purposes, Enablers are addressed using a “programme of activities” [2] so it is convenient to think in terms of a common purposes - action areas framework or matrix (Fig. 1).

The second major innovation of ISO 37101 is that an iterative cross-analysis of the purposes and action areas (called “issues” in the standard) must be carried out when taking the action areas into account in order to achieve the purposes of sustainability. This requirement means that every aspect of an ISO 37101 management system must consider the direct and indirect effect of each action area in the matrix on each purpose. Simply put, every cell in the matrix must be considered.

This cross-analysis for every component of a system to manage urban development meets the need for a paradigm shift in the way infrastructure services are integrated into urban life. One has to move away from traditional silo-based planning, implementation and management practices, towards a holistic approach that recognizes the interdependence of infrastructure systems across the built environment as judged by, for example, the UNOPS *Evidence Based Infrastructure* framework [3], the OECD *Policy Coherence for Sustainable Development* framework [4] and the UNOPS *CAT-I: Capacity Assessment Tool for Infrastructure* [5].

Silos effects in infrastructure systems made up of both physical assets and their enabling context involving knowledge and institutions [3] are minimised through an inclusive process that acknowledges co-dependencies and interdependencies. The cross-analysis must therefore consider not only so-called “hard” infrastructure assets such a railway stations, but also “soft” aspects such as the governance and fiscal sustainability of a community across a diverse range of social, environmental and economic contexts corresponding to the overarching SDGs.

Applicability

At this stage it is useful to point out that the ISO 37101 framework applies not only to a formal, certifiable management system having the features discussed below but also to a much less formal undertaking.

For example, in a top-down scenario, to profit from a holistic, integrated approach to addressing the many facets of the urban environment a community that does not have in place a formal management system that meet ISO 37101 requirements may nonetheless expect project stakeholders and other suppliers to satisfy ISO 37101 requirements. In such a case, the community may for instance expect alignment of a project with the standard's methods and procedures to ensure that action and investment in different areas contributes to identified purposes of sustainable development.

Conversely, for a bottom-up scenario, a project promoted and implemented by private, public or mixed entities may wish to align with ISO 37101 principles and procedures without a formal reference to a community's established ISO 37101 management system. Their aim would be to ensure that the project meets the community's strategy and objectives in a situation where these have not been articulated adequately given the community's context and capacities.

In general therefore, the management system procedures discussed below may be implemented more or less comprehensively and in a very flexible manner depending on:

- the depth and detail of the approach the community wishes to adopt.
- the types of interested parties ranging say from developers, decision-makers and managers responsible for authorising, promoting, financing, planning, designing, procuring, managing, reviewing, and implementing a project to community residents and leaders, local authority administrators and business persons seeking to transform an existing neighbourhood.
- the type of community, for example a mixed purpose historic site, a central business district, a recreational facility, an industrial park, a medium-sized city.
- the physical scale of the community ranging from a neighbourhood, to an entire community (which may be as large as an entire city) and even to a region comprising a group of physically separated settlements.
- the types of community and stakeholder organisations that would be charged with implementing ISO 37101 or aligning projects, specific services and entire programmes to ISO 37101 principles and procedures and, possibly or eventually, to the standard's requirements.
- the type of activities the community wishes to focus on such as the supply of specific services or the management of all its sustainability related activities.
- the life-cycle of activities which or may not involve a typical life-cycle with planning, design, implementation, operation and end-of-life or renovation/rehabilitation phases.

Financial impacts

The financial implications of climate change are significant. There is a growing negative credit factor for issuers of municipal bonds and similar financial instruments if the issuer (for example, a municipality) does not have adequate adaptation and mitigation strategies for climate change in place. This has led to the ratings' agency Moody's changing credit ratings for community development [6].

Using ISO 37101 to weigh the impact of climate risks across all action areas against a municipality’s preparedness and planning for these changes can forestall reduced credit ratings, and improve the access to finance in general, for communities that are impacted by climate change. Having in place certified ISO 37101 system (discussed below) may well be the preferred option.

Certification



It is undoubtedly true that a certified management system carries weight and importance. So the fact that a community of virtually any size can claim conformity (“self-certify”) and thereby declare that it meets ISO 37101 requirements is a major incentive for all interested parties to become involved in establishing an ISO 37101 system.

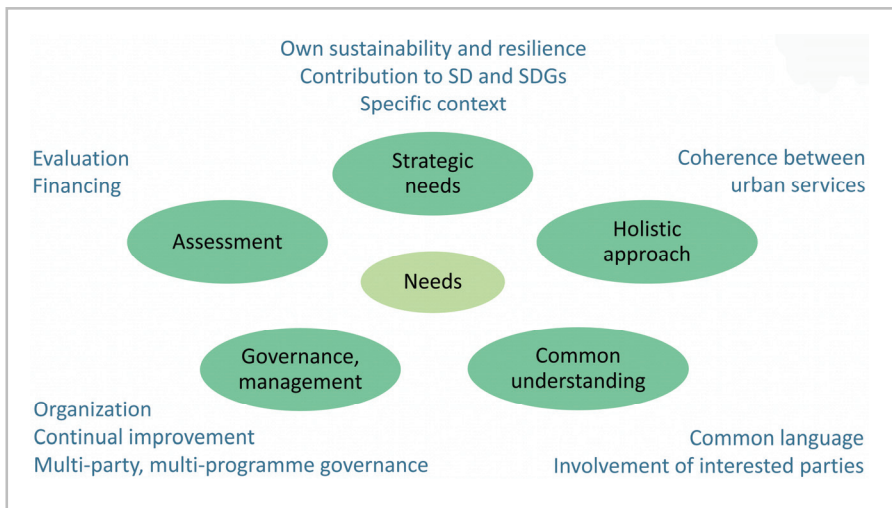


Fig. 2: ISO 37101 global and local benefits.

Aside from allowing a logo attesting to compliance to best practice to be displayed, a management system that meets the standard’s requirements brings important global and local benefits (Fig. 2 and Table 1).

Global benefits	Strategic and organisational benefits
A common language to articulate issues and propose solutions	Enhanced sustainability and resilience
A comprehensive and structured participation by external interested parties.	Proactive engagement through extensive interested party involvement and consensus within the community.
Synergy effects whereby experience and practice in one community is transferred to another.	Recognition and performance assessment.

An enhanced contribution to sustainable development.	Risks and opportunities identified.
Generates clear-cut, well understood and recognised measures of contributions to the SDGs.	A holistic approach that breaks down the tendency for service infrastructure to develop in separate silos.
Coherent reporting	Robust, process-based methodology
Data driven, evidence-based; performance is continually assessed and benchmarked.	Sound planning with a clear, community endorsed mandate.
Reconciles and rationalises sustainability related commitments, standards and working practices.	Coherence between urban services; leverages thematic and programmatic integration.
A form of warranty that funding is applied according to sustainability principles.	Multi-party, multi-programme governance
Helps secure investments on a long-term basis.	Continual improvement.

Table 1: Global and local benefits of ISO 37101 management system approach.

In enabling a community to “claim conformity” to ISO 37101 (i.e., self-certify) without necessarily undertaking second- or third-party certification, the standard possibly overcomes the reluctance of well-structured and highly organised communities such as cities and local authorities in developed countries to consider implementing an overarching standards-based management framework.

It is therefore perhaps not a surprise that the first community to be ISO 37101 certified is a relatively small rural commune called Sappada in Italy’s Dolomite Mountains [7]. The commune wanted to enhance its attractiveness for tourists while preserving its environmental, social and cultural heritage.

Technically speaking, ISO 37101 self-certification is (obviously) “not acceptable” unless: “all ISO 37101 requirements are incorporated into an organization’s management system ... and fulfilled without exclusion”. The system is also subject to the World Trade Organization’s “explanation on the meaning of ISO specific terms and expressions related to conformity assessment” and must include at a minimum a baseline review, planned internal audits and planned management reviews.

Only management reviews are scrutinised externally (“Communities shall ensure recognition of the management reviews by their respective appointed or elected representatives.”). Furthermore, *ISO Supplementary Information* [8] states that “ISO International Standards and other normative ISO deliverables that do not contain requirements (i.e. do not contain the verbal expression “shall”) are not intended to be used for conformity assessment.” ISO 37101 therefore requires that communities “shall” ensure recognition so under ISO 37101, community representatives, essentially elected officials, are responsible for challenging a 37101 claim of conformity (a form of self-certification) and can challenge and withdraw the claim using a management review as the basis.

Having this specified procedure for challenging a claim of conformity would normally be expected to provide the necessary assurance that ISO's best-practice standards are maintained wherever a formal certification of a management system is not undertaken by a certification body according to the ISO/IEC 17021-8 conformity assessment standard [9].

Implementation

The ISO standard focuses on the contributions to six purposes of sustainability across 12 action areas in implementing a management system that essentially comprises a baseline review, strategy definition, an action plan, monitoring, and above all continual improvement.

Various tools incorporating the cross-analysis of purposes and action areas are needed to implement the ISO framework. These include: prioritisation analysis, indicator cluster analysis; strategy analysis; gap analysis; materiality assessment; capacity projection; stakeholder management; change management; maturity analysis; performance monitoring; reporting.

Implementation of the World Bank's USF envisages essentially identical procedures except for continual improvement which is an inherent and invaluable component of any ISO-based management system (USF procedures cover a diagnosis, vision, priorities, action planning, monitoring, financing, and cross-cutting processes).

Both ISO 37101 and the USF stress inclusive stakeholder engagement and integrated planning to manage urbanisation efficiently, to maximize synergies and to minimise silo effects.

Moreover, many of these tools envisaged by the USF are incorporated in ISO 37101. For example, the USF diagnosis stage which aims to "identify key focus areas that are globally relevant" is equivalent to the ISO 37101 baseline review for "the development of a sustainability strategy". For this stage and indeed elsewhere, the USF tends to be more helpful than ISO 37101 in that it recommends and describes specific tools including data analysis, trend analysis, benchmarking analysis, strategy analysis, prioritisation analysis, and scenario analysis (for both business-as-usual trends and intelligent, policy driven, growth scenarios).

The USF also confirms that most action areas contribute at the very least to enablers for action-area specific policies, legislation, regulation, capacity analysis, and decision making. Additional USF methods and tools to evaluate enabler contributions to ISO 37101 action areas are summarised in Appendix A.

Finally, incorporation of the USF enabler concept into the ISO 37101 framework also has the additional advantage that it highlights the need for some important but easily overlooked specialised methods and tools such as tools to manage collaborative, multi-level governance.

The various methods and tools will be described in forthcoming ISO 37101 implementation guides starting with ISO 37104 [10] and a planned “project developers” guide [11] along with other proposed guides for small- to medium-sized cities and for business districts.

Indicator frameworks

Indicators are important for any framework approach, whether it is used in a formal management system or for less formal guidance. ISO 37101 not unsurprisingly requires that indicators be used to collect relevant data and to ensure that strategies, programmes, projects, plans, and services remain on track throughout the operational phases in their respective life cycles. Furthermore, data must obviously be collected based on indicators for each of the action areas “selected” (i.e., decided as being material based for example on a materiality or relevance assessment).

Depending on the agreed evaluation concept, both quantitative and/or qualitative data are permitted. ISO 37101 summarises a few examples of indicators and the ISO 37120 standard for city services indicators [12] notes wherever possible which indicators should be used for various purpose - action area combinations. Forthcoming ISO indicator sets [12] for urban smartness and resilience will presumably adopt the same approach.

The USF goes somewhat further by providing appropriate declarations taken from various official sources that provide the basis for indicators, a feature that is developed below.

Optimised SDG compatible Declarations (OSCDs)

It is undoubtedly the case that an ISO 37101 management system must be able to report indicators that correspond to SDG targets, notably SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable). The UN Global Compact and GRI initiative *Business Reporting on the SDGs* [13] has published an inventory of available disclosures and possible actions for various themes for each SDG target that should be considered by business. This inventory has been mapped [14] to the ISO 37101 purposes - action areas framework and “optimised” using the Citibank “cause-and-effect” matrix of “driver” and “resulting” SDGs [15] to give so-called “optimised” declarations. An optimised declaration is a declaration that covers the three sustainability perspectives (environment; economy; social) and reflects the impact on an SDG target of an action in a specific ISO 37101 action area for a specific purpose.

As indicated by the grey shading in Fig 1, it should be noted that for this optimisation the enablers purpose is not mapped to SDGs for the same reason that SDG 17 (“Partnership for the Goals”) is not mapped in the cause-and-effect matrix (both are pre-requisites for action).

Fairly general published mappings of ISO 37101 action areas and purposes to the SDGs based on the so-called “5Ps” and “6 Elements” SDG mappings are inadequate for many action areas. For example, in the case of the culture action area, the optimisation analysis does not demonstrate that the principal

SDG target for cultural heritage, namely 11.4 (the “heritage” target), is the most important target for action.

A much more detailed functional mapping is necessary to overcome this limitation. One approach to establish which departments of say a municipal authority or a city are active in a specific area and to then map the activity to the relevant SDGs. A detailed mapping of this type has been carried out by municipalities in Belgium [16]. The analysis based on combining this mapping with the cause-and-effect matrix to give OSCDs is validated because the analysis gives the correct SDG target, namely the SDG 11.4 heritage target, as the most important target for action in the area of culture.

Extension of Fig. 1 caption

A detailed mapping of SDGs for municipal functions that act upon culture give Optimised SDG-Compatible Disclosures (OSCDs) for indicators corresponding to the 5 orange and 4 purple action areas - purposes. A less detailed mapping using the 5Ps and 6 Elements SDG mappings gives OSCDs for the green cells and the 4 purple cells. So a detailed mapping more than doubles (from 4 to 9) the number of action areas - purpose combinations for three action areas (culture; cohesion; economy) that should be monitored in estimating the impacts of municipal actions on culture. The same increased capacity for more a more sensitive estimate of SDG impacts would be expected for actions in other areas provided these actions can be mapped in detail to SDGs.

Moreover, as illustrated in Fig. 1, the detailed mapping identifies nine action area - purpose combinations for which declarations and their accompanying indicators can be used to estimate the impact on SDGs of actions which address culture and heritage. Appendix B lists the broad range of indicator topics that have been adopted for the culture, cohesion and economy action areas by ISO 37101 case studies.

To conclude, the optimisation analysis to find declarations that can be used to establish indicators which truly and unequivocally relate to SDG targets is being extended to all the main ISO 37101 action areas.

Outcome and enabler indicator declarations

The USF assigns some indicator declarations to SDG outcomes but many of these declarations are best assigned to enablers. For example, an outcome declaration is assigned to stakeholder participation, an aspect of the governance action area for the enabler purpose; another is assigned to land use and zoning, an aspect of the living and working environment action area for the same purpose.

In the case of SDG 11 (the “cities” SDG), five of the USF’s 14 SDG 11 outcome indicator declarations are for enabling indicators. Including all SDGs means that approximately one-quarter of the USF indicator declarations speak to the enablers and not to the SDGs. However, a further advantage of integrating the USF into the ISO 37101 framework to create a common framework involving both

outcomes and enablers eliminates the need to force USF enabler indicators into a outcomes framework since they two types of indicators are handled separately.

For enablers as opposed to the other six purposes, an impact assessment would not consider impacts on outcomes but would need to measure contributions made to the environment within which action in a relevant action area is carried out. This may present challenges. For example, different weightings should perhaps be assigned to enablers as opposed to the other purposes whenever the common framework is used for baseline and trend analyses, strategy analyses, materiality assessment, or setting priorities, objectives and targets.

The management system

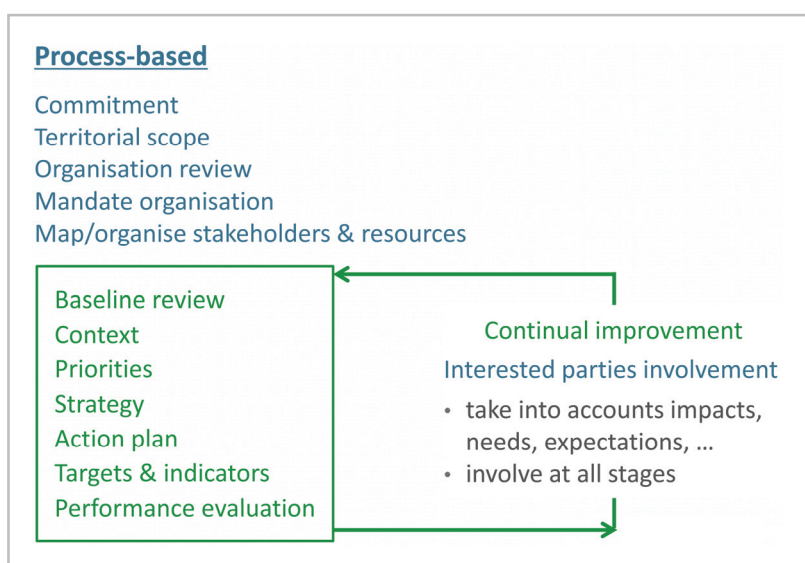


Fig. 3: An overview of an ISO 37101 management system.

Many communities will have management systems in place. Indeed, ISO process-based management systems such as ISO 37101 now adopt a common high-level structure so as to facilitate adoption and integration with management systems for various aspects of a community’s activities. Generally speaking, depending upon

the size of the community these will be for the entire community or for specific services such as a bus system and they will manage aspects such as risk, environment, quality and health and safety.

In the case of ISO 37101, as summarised above and in Fig. 3, both a formal system and a less formal ad hoc implementation of the standard require a political commitment to implement a system, the definition of the territorial scope, an organisation review, the mandating of an organisation to implement the system, and the mapping, analysis and organisation where possible of interested parties, resources, ecosystems, conformity regulations, and of risks in general. There then follows the various components of the system, each of which must also refer to the purposes - action areas framework.

As for any planning system, implementation starts with an analysis of the context and interested party expectations and the formulation of an overall policy for sustainable development. Then come a baseline review to generate a community performance profile, the identification of priorities, strategies and objectives, the formulation of an action plan with detailed procedures, process descriptions and documentation requirements for maintained and retained information, the definition of targets and indicators, performance evaluation, the identification of weaknesses and non-conformance,

improvement measures, audits, reviews and possible certification. Each process and the entire system are subject to the classic “plan-do-act-check” PDCA Deming cycle for continual improvement that is carried out together with the interested parties in the light of needs, expectations, impacts, and the current performance.

Conclusion

A common framework based upon the ISO 37101 community sustainability management framework for outcomes that incorporates the World Bank - GEF Urban Sustainability Framework for enablers provides an effective and practical basis for the many methods and tools that can be used with management systems and less formal approaches to ensure a holistic, integrated sustainable development.

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Further information

Sustainable Development Committee
 International Federation of Consulting Engineers (FIDIC)
 Contact: Peter Boswell (info@peterboswell.com)

Further resources

Urban Sustainability Management
<http://77101.org>
<http://37101.wiki> (under development)

Appendix A: Enabler contributions

The actions listed below support the Urban Sustainability Framework enabler purpose that is integrated with the ISO 37101 action areas - purposes framework.

Action area	Enabler actions
Governance	vision and long-term strategic planning; stakeholder participation; data management; trend analysis
Innovation	access to finance; ease of doing business; fiscal incentives
Culture	culture and heritage management (policies, planning, regulation, awareness raising)
Cohesion	training; equality; job creation
Economy	accountability and transparency; creditworthiness; revenue and financial autonomy; expenditure management; management of debt and other obligations; fiscal sustainability
Living and working environment	urban growth management (policies, planning, density mapping, land use surveys, urban growth patterns); informal settlement management; affordable housing; land pricing strategies
Safety and security	food security; resilience planning
Infrastructure	revenue streams; investment strategies; connectivity; universal access; freight management
Mobility	mobility integration and transport management (origin/destination surveys, transport master planning, transport management, transport planning integration)

Appendix B: Culture indicators

Listed below are the indicator topics that have been adopted for the culture, cohesion and economy action areas by ISO 37101 case studies.

Social cohesion
 Sense of pride
 Sense of local identity
 Appeal to businesses
 Appeal to tourists
 Culture inclusion in community and tourism activities
 Protect and conserve cultural and historical heritage
 Access to literature/literary heritage

Protected heritage neighbourhoods
Heritage awareness (knowledge and educational activities)
Regulatory frameworks
Preserve lifestyles, including intangibles (e.g., practices, know-how, languages, spirituality and customs)
Reinforce cultural and community identity
Evolution of heritage and traditions
Use of the natural environment as a source of inspiration for identity and values
Incubators of creativity
Synergy between inheritance and innovation
Using culture to raise awareness of sustainability issues
Expectation for change of culture and identity
Accessibility and affordability of cultural events
Individual and collective identity
Urban layout and building form
Mixed use public spaces
Walkability and compactness
Adaptive re-use of the existing built fabric
Inter- and intra-territorial cultural exchange
Cultural engagement in community settings close to home
Creative responses among adults with physical disabilities
Maintaining life-long interests in culture among adults with physical disabilities
Community understanding of disability, capacity and creativity
Integration of migrants, new residents and