The Global Impact Analytics Framework

GiAF Global Impact Analytics Framework

PSICOST

BRIEF OVERVIEW

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Introduction

Policy or practice impacts are broadly defined as "demonstrable changes, or benefits to products, processes, policies, and or practices, that occur after a research project has concluded" [1]. There is growing demand for research evaluations that provide evidence of demonstrable benefit and impacts of research, on policy, practice and population health [2, 3]. In recent decades, developing methods to undertake an analysis of impact for health and social services implementation research has become a major priority worldwide. There is a corresponding growth in the current 'research on research' literature which has produced an increasing number of frameworks, constructs, measures of individual and service outcomes, processes and activities [4-7].

Historically, measuring the impact of research was based on bibliometrics (number of publications, citations), time factors (e.g. ethics to trial registration, first publication), subsequent grants, quantitative methods such as costs or cost benefits [2, 8-10]. There has been a major effort worldwide to improve the methods of evaluation of research impact analysis by national funding bodies [11-13] as well as by main research reference networks [14-16]. However, there is less effort on international consensus generation and harmonisation on the methods and tools. As a consequence, the differences in terminology and methods in impact analysis have increased at the same pace of the progress of implementation sciences.

Under these conditions, the terminology is unclear. Terms are often ambiguous or vague, used inconsistently, or there are two definitions referring to the same name and vice versa (duplicate synonyms). Likewise, there is a major problem in the identification and use of measures to evaluate these constructs [17-19]. More recently, mixed methods for impact analysis have been suggested including qualitative methods, with triangulation of information such as stakeholder interviews, focus groups and a realistic evaluation approach (theory building) [20] or case studies [21].

In addition, there are substantial differences in the conceptual framework underlying impact analysis of implementation research. First, implementation occurs in specific settings and contexts and therefore a definition of target entities and their environment is essential. The conditions and impacts vary depending on factors including the research applicability, context and ecosystem, the phase of dissemination and implementation.

Second a clear definition of the phases of implementation, the content of the research, and the characteristics of impact such as the types, the components, stages, phases, and development. Third, the timing of impact analysis influences the outcome and depending on the dissemination to implementation, translation and application continuum. Impacts may change parallel to the maturity or stage of implementation. Measuring proximal outcomes at the early implementation phase (maturity) will differ from distal end or later implementation after the research has been fully adopted, diffused and spread beyond the original project (evolution phase). Similarly, the measurement components are extremely complex, and the domains of evaluation of inputs, throughputs and outputs requires a detailed analysis.

Why develop the GIAF?

There is a need for the agreement on the basic constructs that should be defined, agreed and measured. Further, we need tools to assess the ***process*** *of implementation research*, what was done, identify the gaps in the process of implementation, support organisations and researchers to learn from their experience, so that improvements can be made. In order to facilitate disambiguation, achieve consensus on common methods and comparability of results, it is necessary to elaborate and use a common terminology and taxonomy.

What is the GIAF?

The Global Impact Analytics Framework (GIAF) includes a taxonomy, glossary and toolkit to support the impact analytics of health and social services implementation research.

What is different in our approach?

The GIAF was developed over many years. We have used the concepts, adapted previous research in the field and developed a new framework and taxonomy, glossary and toolkit. We have developed the GIAF to be 'fit for purpose' in any of the phases of implementation research: the preparation phase; early implementation (maturity); or later implementation (evolution) once the original implementation research project is completed [22, 23]. The GIAF includes a toolkit relevant to any sector impacted by the research (e.g. research, education, employment, policy and practice, market, population and society). Critically key concepts, relevant to all health and social services research impacts underpins the GIAF. These underpinning concepts of the GIAF are outlined in Table 1.

Table 1. Key elements in impact analysis used for the GIAF development

Note selected relevant authors are cited (not a complete list of subject area authors)

Elements of Impact Analysis				
Implementation	**Development** (Incorporates stages and phases) • Preparation • Application • Analysis	**Stages [2, 24]** • Screening • Scoping • Appraisal • Evaluation	**Phases** [22, 25, 26] • Initiation (preparation) • Maturity (early implementation) • Evolution (late implementation)	
Framework	**Conceptual frames** (theory, framework, model, typology etc) • Scoping review (n=54) • Process of care • Health care ecosystem • Complexity • Strategies, barriers & facilitators	**Content** [27, 28] • New (emerging) Scientific Knowledge • Applications: Plans/ Services/ Interventions / Methods/ Products	**Components [26, 29]** • Resources • Process • Results	**Domains** - Initiation (4) - Maturity (6) - Evolution (6)
Design	**Types [2]** • Mini IA • Standard IA • Maxi IA	**Timing** • Prospective • Concurrent • Retrospective	**Measurement** • Qualitative narrative - Quantitative Scales - Profiles • Ladders	**Assessment means** • Interviews • Surveys • Available evidence e.g. records, reports, website pages • Focus group
Purpose	Calibration	Organisational learning Knowledge sharing	Systems improvement	

The main drivers of GIAF are:

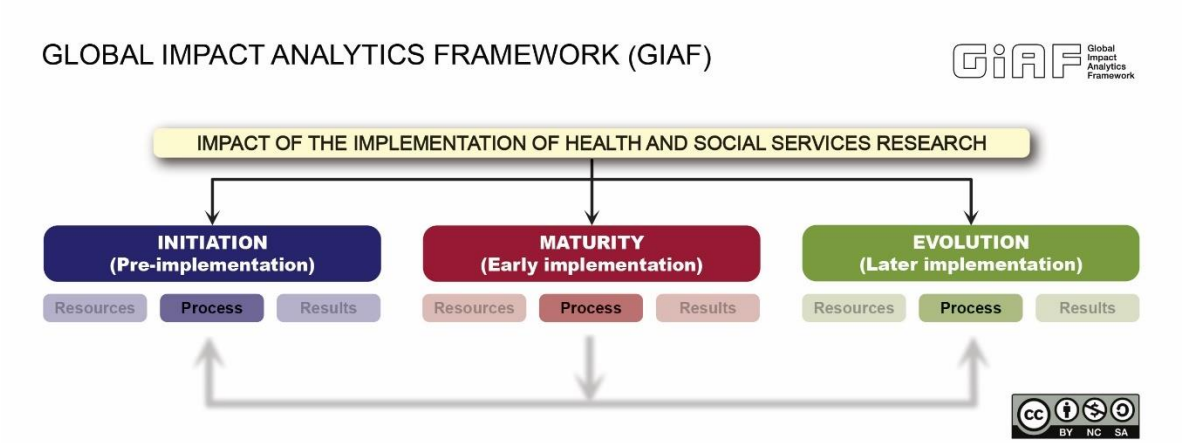
- Systems dynamics and complexity: The approach recognises that systems are composed of many interacting components, that are characterised by different levels of variability, uncertainty and organisation [30]. The GIAF adopts a framework of scientific knowledge and complexity previously used in implementation

research [27, 31, 32]. The framework facilitates a better understanding when there is complexity in the continuum of research and the development of emerging scientific knowledge (eSK). It recognises that scientific knowledge develops from discovery through to corroboration and finally implementation research. The framework includes evidence gathered in the experimental and observational research phase (discovery) but recognises other pillars of scientific knowledge elicited from experts (formal and tacit knowledge) and users (experiential knowledge) and importantly in implementation research contextual knowledge (systems, history) [27, 28].

- Healthcare ecosystems: The approach encompasses several key frameworks [33-35]. The ecosystem approach takes into account systems thinking and complexity, a whole system perspective, the process of care and involves various levels in the ecological system, from the nano level of individual users, carers and professionals to the micro service level, and the macro organisations in local areas, country or regional systems) [20].
- Ecological production theory and process of care: The ecological production theory uses a systems approach and distinguishes between the inputs, process and outputs, thereby informs and potentially improves evaluation studies [34]. The process of care model uses the same theory with both a geographical and temporal dimensions [36]. The GIAF is informed by these dimensions and refers to three temporal phases, resources (inputs), process and results (outcomes).
- Organisational dynamics and learning: A complex adaptive system approach uses system thinking and is characterised by organisations gaining feedback, learning from experience and adapting [30]. Thereby the process of impact analytics can lead to organisational learning and the reduction of uncertainty, ubiquitous in the field of implementation research [35].

Figure 1 provides the high-level perspective of the GIAF taxonomy tree and the three phases of impact analytics (parent category in the taxonomy). Each phase involves a stage of resources (inputs), process (throughputs) and results (outputs) (child category in the taxonomy).

Figure 1 The Global Impact Analysis Framework (GIAF) Taxonomy Level



In current impact analysis of implementation research, the resources and the results are typically measured. The GIAF concentrates on the process component because there is this gap in implementation research of measuring the and its impacts. Process is typically not measured or not comprehensively measured in impact analysis. The GIAF provides a framework, a taxonomy and toolkit of ladders, scale, and profile with associated checklists for each.

Moving down a level in the GIAF taxonomy tree, we can see further detail for the *process* component of the taxonomy in each phase. The first is the initiation phase which is the whole phase of starting an implementation project (pre-implementation) that includes its planning, engagement, co-creation and first stages of readiness (GIAF Glossary). Figure 2 presents the initiation (pre-implementation) phase and process domains ('grandchildren' category). Figure 3 provides the sub-domains at the next level of the taxonomy ('great-grandchildren' category) of the ladders, scales and profiles.

Figure 2 The GIAF Initiation (Pre-implementation) phase of implementation research

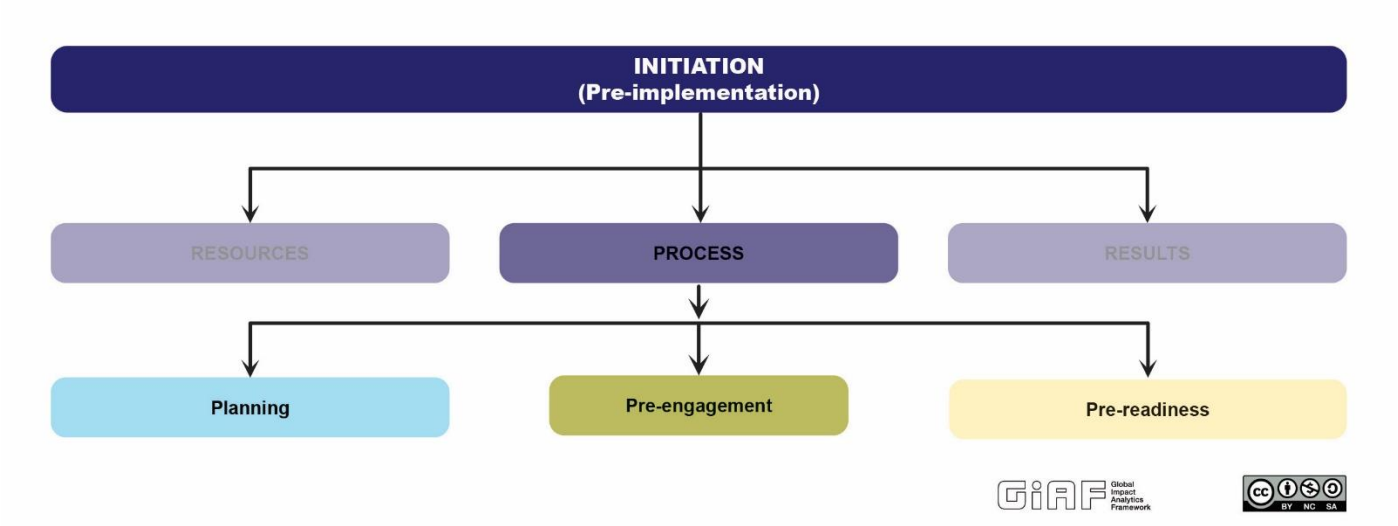
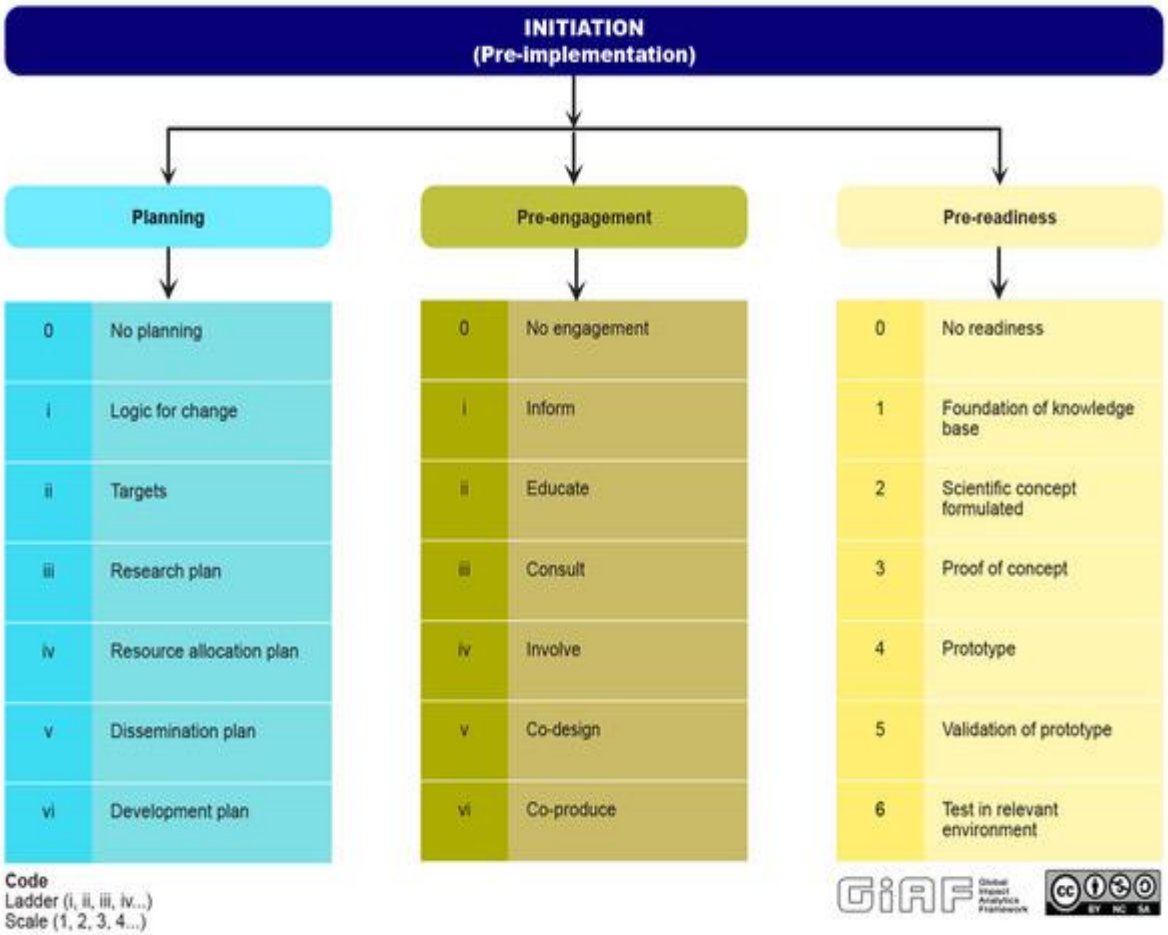


Figure 3 The GIAF Initiation phase (pre-implementation) process domains and sub-domains.



Once the emerging scientific knowledge has a validated prototype, it is ready to be implemented in the real-world in a specific context and target audience e.g. in a region or across an organisation. The real-world is defined as the surrounding circumstances or conditions that exist, as opposed to one that is theoretical or imaginary. The environment includes physical, virtual, blended ecosystems (GIAF Glossary). This phase is called the maturity phase. The Maturity (early implementation) phase is when the application of the emerging scientific knowledge is tested in the real world for the first time or in a new context (early implementation).

The same levels are presented below in Figures 4-7 inclusive for the next two phases.

The following Figures 4 and 5 provide the two levels of the maturity phase process domains and sub-domains.

Figure 4 The GIAF Maturity (Early Implementation) phase of impact analytics

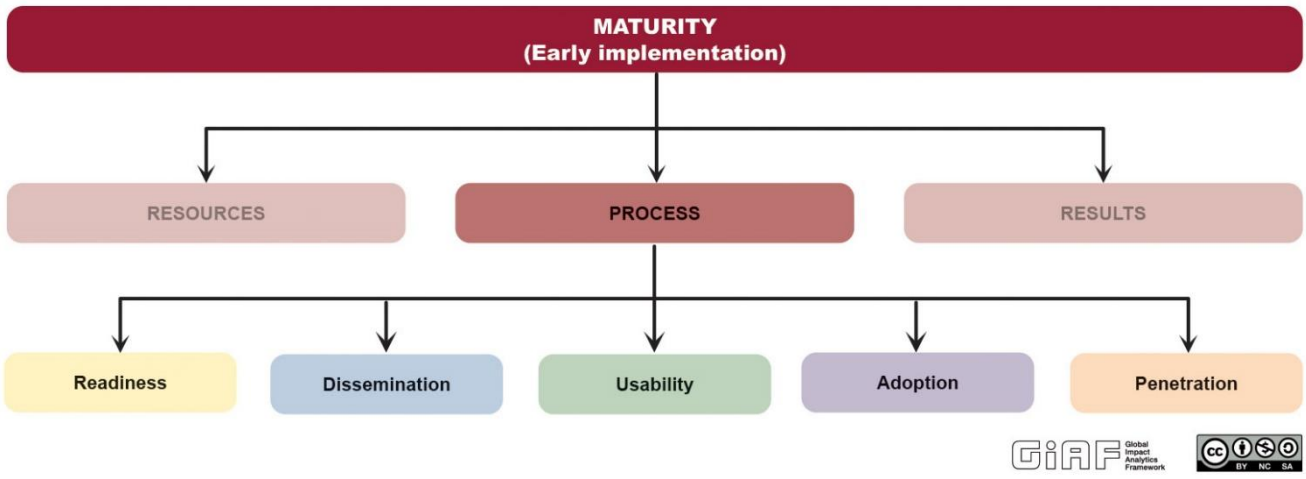
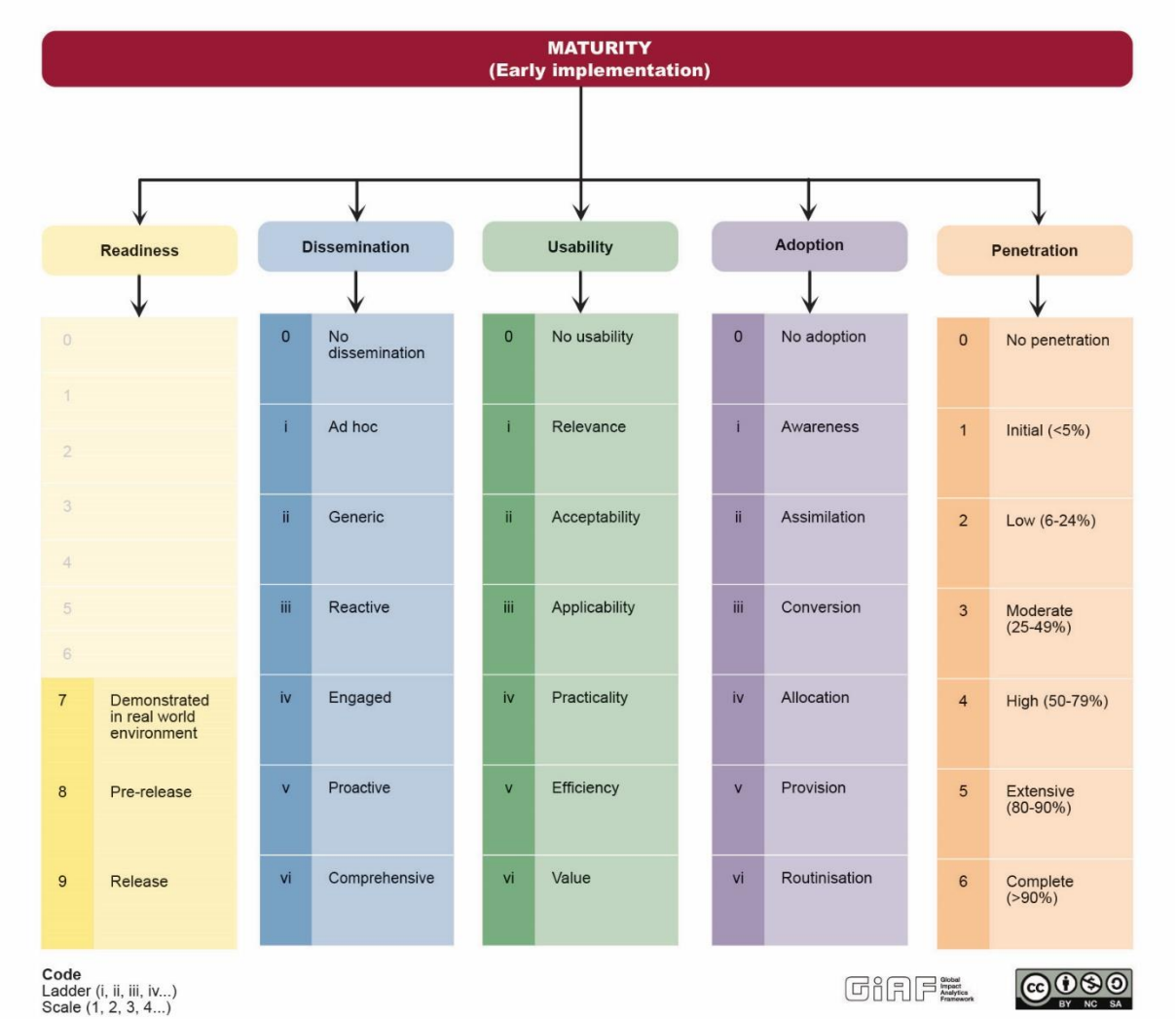


Figure 5 below provides the domains and sub-domains in the ladders, scales and profiles for the maturity phase.

Figure 5 The GIAF maturity (Early implementation) process domains and sub-domains



The final phase of implementation research is the Evolution phase (Later implementation). Evolution refers to the phase occurring beyond the early implementation study or research project (GIAF glossary). It is the phase when the application of the emerging scientific knowledge is maintained, and spread including the extension, expansion, diversification and exporting the application of the emerging scientific beyond the early implementation study (e.g. new sectors, markets and countries).

Figure 6 The GIAF Evolution phase (Later implementation) phase of impact analytics

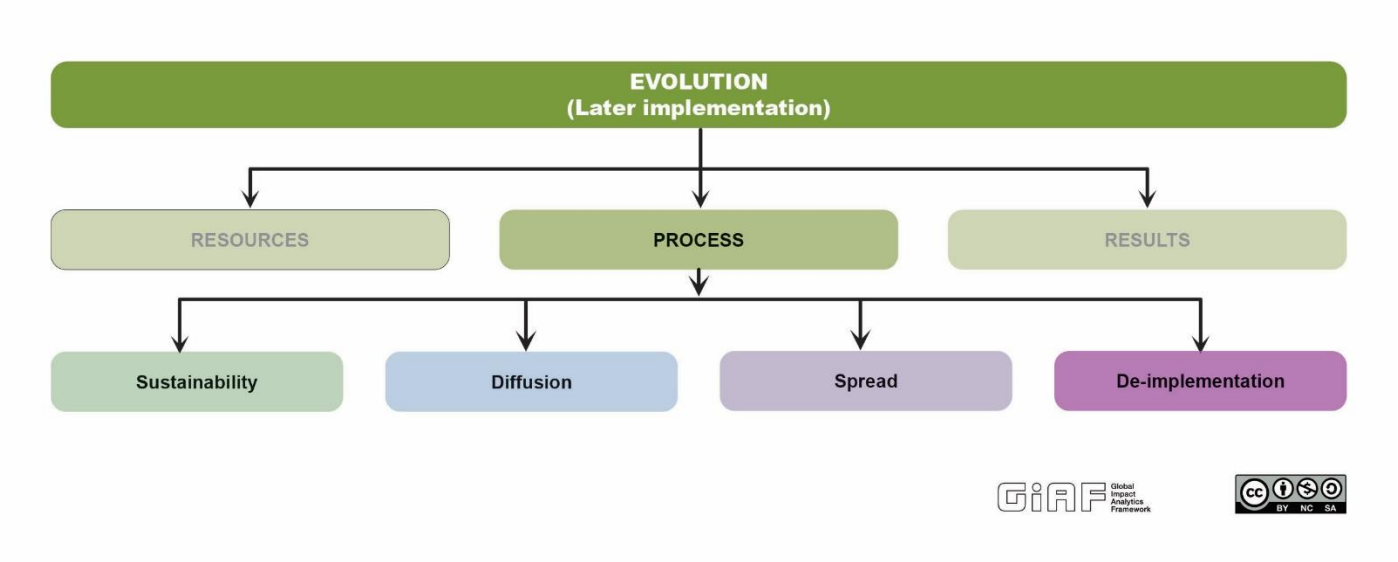
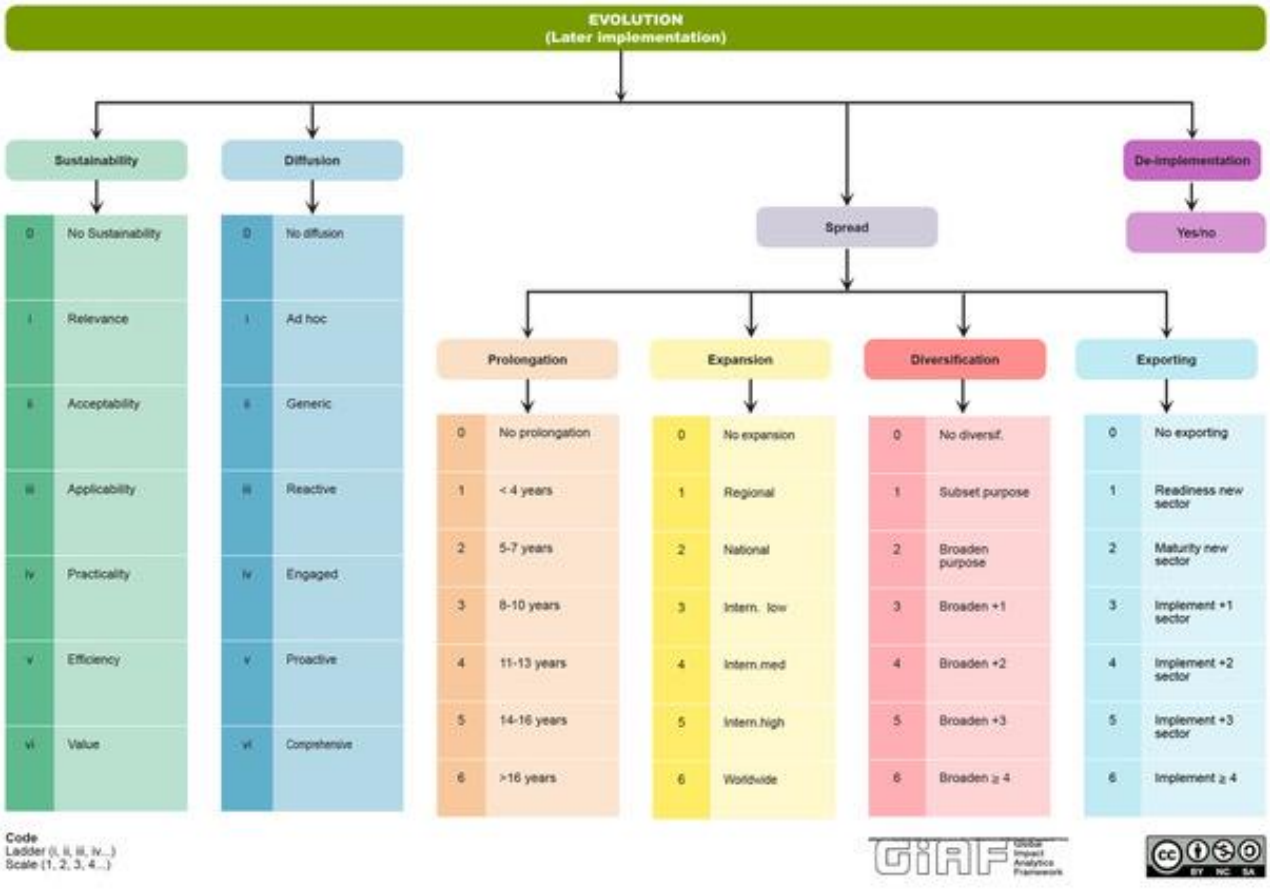
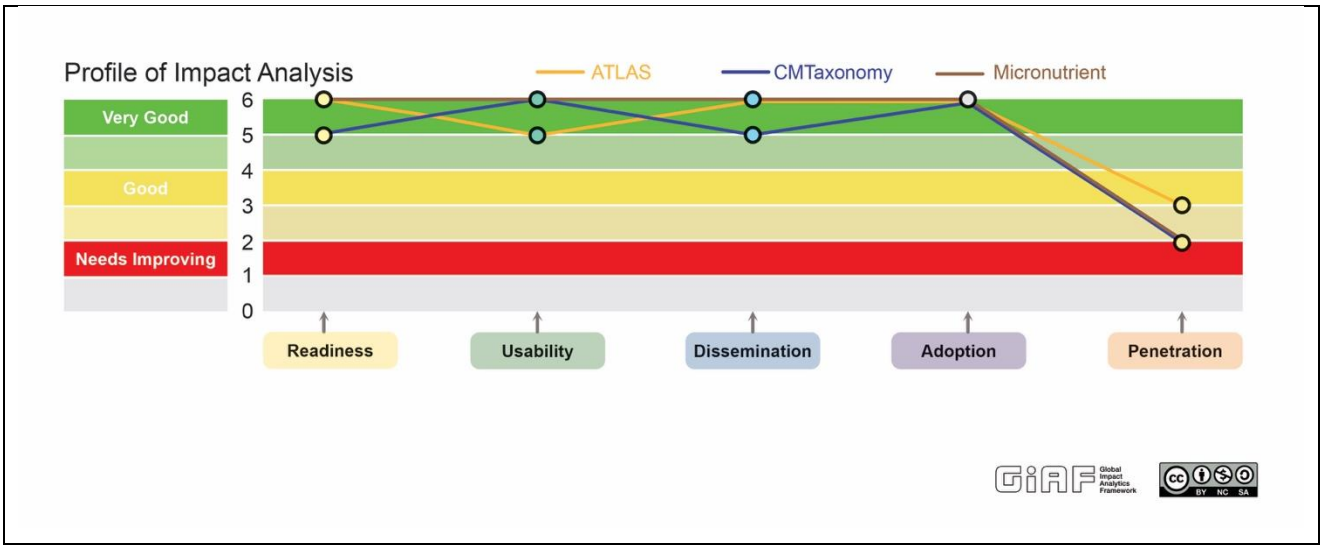


Figure 7 The GIAF Evolution phase (Early implementation) process domains and sub-domains



Another tool in the GIAF toolkit is the Profile of Impact Analysis (PIA). The purpose of a PIA is to identify differences across projects rather than to provide a 'scorecard' for the purposes of research and organisational learning and thereby inform future research. Figure 8 provides an example of an impact analysis using the five ladders of the maturity phase (early implementation) on comparing three projects represented in a graph. The PIA provides a profile of maturity in this phase of implementation research. The visual image enables a better understanding of the gaps and weaknesses in the implementation research. The Atlas was a research study in Spain, the CMTaxonomy was a research study in NSW, Australia and the Micronutrient study was in specific districts in Bangladesh.

Figure 8 **The GIAF Profile of Impact Analysis (PIA)**



Limitations

The GIAF toolkit and approach does not encompasses all the different frameworks suggested for impact analysis in implementation research nor does it include all the alternative visualisation tools. This does not only refer to healthcare. The complexity/systems thinking approach has extensively been applied in other sectors such as defence, environmental sciences, business, and systems and civil engineering.

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