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White Paper

Impact Measurement and Standards

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WHITE PAPER FOR IMPACT MEASUREMENT AND STANDARDS

1. The need to measure and standardise ESG impact

Despite rapid economic growth and increasing interest in impact investment worldwide, less attention has been paid to the question of whether this growth is sustainable for people and the planet. In an ideal scenario, growth would happen within planetary and social boundaries. However, current financial value is often prioritised and achieved at cost to society and the environment. For example, small farmers in Indonesia have long practised slash-and-burn agriculture, and in recent decades large companies have industrialised the practice. The peatland blazes in Indonesia release smoke and large amounts of greenhouse gases, which impact both Indonesia itself, and neighbouring countries such as Malaysia, the Philippines, Thailand, and Singapore. A similar pattern can be observed regarding public health issues such as the COVID-19 pandemic. These climate and social impacts of growth suggest that the current approach to financial growth is not sustainable in the long run, and organisations often fail to consider the externalities while they are seeking financial returns. To better align financial value with environmental and social values, it is necessary to develop and harmonise Environmental, Social, and Governance (ESG) measurements and standards. Organisations should measure and internalise the negative externalities to the environment and society resulting from their primary economic activities. Doing this requires organisations to report on these impacts transparently and to start managing both positive and negative effects, with the ultimate aim of creating value for all stakeholders and ensuring that economic growth takes planetary and social benefits into consideration.

While trillions of dollars are invested into sustainability and ESG globally, we have limited knowledge about whether these investments are genuinely making positive and material changes to the environment and society. Meanwhile, many frameworks are being developed for organisations to report their ESG impact,[1] but there is an absence of standardisation and comparability across different frameworks. As a result, current sustainability reporting often lacks the comparability and reliability that key users need to make decisions. There are also other challenges with current sustainability reporting. Existing

[1] Examples include Global Reporting Initiative (GRI), International Integrated Reporting Committee (IIRC), Sustainability Accounting Standards Board (SASB), Task Force on Climate-related Financial Disclosures (TCFD), International Organisation for Standardisation 26000 (ISO26000), EU Taxonomy for Sustainable Activities, EU Corporate Sustainability Reporting Directive (also called Non-financial Disclosure Directive), and UN Sustainable Development Goals (SDG), to name a few.

standards are not applied in a consistent manner with common language. In addition, lack of meaningful stakeholder engagement means that reporting organisations can decide to report on issues that are deemed to be important solely by the organisation itself. Moreover, numerous ESG ratings and metrics provided by third-party rating agencies (e.g., Refinitiv, MSCI, S&P Trucost, Bloomberg, Sustainalytics, Vigeo IRIS) mainly focus on public equity and lack transparency and consistency. Given that small- and medium-sized businesses form a critical part of the economy in Southeast Asia, this approach has limitations. Due to these challenges, reporting organisations can find themselves unable to make incremental changes, while they continue to maximise their financial value at the expense of environmental and societal value erosion. This can also lead to misguided investment decisions and give rise to the potential for greenwashing.

As a result of the reasons outlined above, there is an urgent need for a standardised framework to measure and report environmental and societal value and impacts, where possible in monetised terms and with a clear structure, creating a complete and holistic picture of the overall impact of the reporting organisation. A more inclusive ESG measurement that reflects the welfare of broader stakeholders is essential for organisations to clearly measure the impact of their externalities while continuing to enjoy financial returns.

2. SGFC's approach to ESG impact measurement

Given the importance of ESG impact measurement in guiding corporations to materially improve their ESG activities and helping asset managers to make sound investments, Singapore Green Finance Centre (SGFC) at Singapore Management University has taken the initiative to develop more transparent, reliable, and comparable ESG and impact measurement frameworks and standards for organisations in Singapore, Asia, and around the world. This initiative leverages SGFC's experience working with various stakeholders and co-developing the Impact-Weighted Account Framework (IWAF).

The IWAF builds on a number of existing frameworks, methods, and research.[2] The key aim of this framework is to help organisations of all sizes, structures, and locations to create their Impact-Weighted Account Statements (IWAs) by implementing accounting systems for the impacts they cause or contribute to. It is important for every organisation to align their financial value with other types of value and impacts that are often overlooked even though they are critical for the organisation to remain sustainable in the long run. The IWAF

[2] The development of IWAF is strongly influenced by Global Reporting Initiative (GRI); Impact Institute; IIRC; IASB (IFRS); US GAAP (FASB); Global Impact Investing Network (GIIN); Impact Management Project (IMP); United Nations, other intergovernmental organisations and scholarly sources.

framework complements and adds on to existing sustainability reporting standards which do not always report on impact. It also allows negative externalities to be addressed by organisations and further priced in by investors by quantifying and monetising them in comparable units.

Our ESG and impact measurement and standardisation approach, as developed in the IWAF, relies on quantitative methodologies to conduct an outcome- and impact-based analysis. The IWAF differentiates between absolute impact and marginal impact, as impact measurement usually relies on counterfactual thinking (namely, measuring impact based on the reference scenario). In addition, it also differentiates between direct impact and indirect impact. The IWAF uses science-based methods to convert natural units of environmental and social impact on all stakeholders into monetary units, and aggregate both the direct and indirect impacts to obtain a measure of the organisation's total impact in monetary terms. Annex A provides the standardised list of impact categories, and Annex B provides a conceptual framework of our approach. This approach helps organisations to conduct an Integrated Profit & Loss (IP&L) analysis (as opposed to a traditional profit & loss analysis) to measure the monetisable impact on capital for all stakeholders.

It is worth noting that not all impacts can be monetised at this stage without running into ethical questions. For example, assigning a dollar value to the loss of dignity that forced labourers experience is not within the scope of the IWAF methodology. Some level of monetisation is helpful to understand the organisation's impact on certain issues but it is often challenging to reach a single figure by adding several positive and negative impacts across diverse social and environmental impacts. There is no widely accepted conversion rate between certain impacts and monetary units. For more complex issues, assigning a score or rating may be more workable in the short term and this is likely to remain the case in the longer term as well.

Nonetheless, there is benefit to reporting on ESG and impacts with a standardised approach as proposed in the IWAF. This would eventually lead to external signalling — prompting organisations that perform better than average to declare their IWAs, and more organisations following this pattern. With the continual adoption of IWAs by organisations across the world in this manner, we hope to alleviate the challenges of measuring ESG performance.

2.1 ESG and impact measurement frameworks

The current set of ESG reporting practices adopted by most organisations is to produce a separate sustainability report along with an annual report (or various interim financial reports)

as required by securities exchanges. These separate reports often do not connect and thus fail to show the outcomes of various managerial decisions with respect to the positive or negative social, environmental, and economic impacts on a broad group of stakeholders. While the Integrated Reporting (IR) framework helps to overcome this shortcoming, one critical challenge in using the IR framework is the ability to demonstrate accountability for various stakeholders within the broad base of capitals upon which an organisation depends for its success.

The IWAF-based ESG and impact measurement method is on the forefront of measuring, reporting, and managing sustainability and impact. Unlike the current IR framework which only monetises financial capital, the IWAF approach monetises non-financial capitals to further facilitate integration between ESG impact reporting and financial statements. In essence, the IWAF provides a clear view of financial and impact performance within a single report by translating all types of social and environmental impact into comparative and transparent monetary units that aid decision-making. By monetising impact metrics, the IWAF also takes the foundational works of GRI, SASB, GIIN, IMP, and Social Value Principles[3] a step forward.

The IWAF differs from other existing frameworks for impact measurement and monetisation. One such difference is between the tools employed to value impact under the IWAF and the tools used by PwC for its Total Impact Measurement and Management (TIMM).[4] TIMM's impacts are grouped into four areas: economic, social, environmental, and tax impact, each comprising five indicators. TIMM also considers ecosystems and human well-being in its assessment of impacts. In contrast, IWAF considers stakeholders' welfare in totality — in terms of well-being and rights — in its impact valuation. Another stark difference is seen in the Impact Pathways adopted by the frameworks. TIMM values the impact of a business arising from direct and indirect impacts, while the IWAF not only differentiates between direct and indirect impacts, but further differentiates between absolute and marginal impacts, based on the fact that impact measurement usually relies on counterfactual thinking (namely, measuring impact based on the reference scenario). As a result, the IWAF extends valuation beyond just valuing direct and indirect impacts. More details about the Impact Pathway and the types of impact used in IWAF will be discussed in Section 6.

[3] Social Value International have developed a set of principles as a foundation that can be applied by organisations that want to improve their decision making and expand their understanding of the value that they create. According to the Social Value Network, these principles are developed around the acceptable social accounting principles.
[4] More information available at: https://www.pwc.com/gx/en/sustainability/publications/total-impact-measurement-management/assets/pwc-timm-report.pdf

3. Key concepts of the IWAF

To fully understand how to quantify, value, and aggregate impact through IWAs, it is necessary first to understand the conceptual foundations underlying the IWAF. This section discusses the fundamental concepts and explains what constitutes an impact with reference to stakeholders and welfare, as well as the concepts associated with impacts.

3.1 Stakeholders and welfare

IWAs consist of a set of accounts ('impacts') reflecting positive or negative impacts of the organisation on its stakeholders.

Stakeholders are individuals affected by an organisation's business activities and the individuals who can affect an organisation's value creation ability. Stakeholders can include investors, employees, suppliers, nature and its beneficiaries, governments, local communities, and others. They can be classified under a limited set of stakeholder groups relative to their relationship to the organisation under assessment. Annex A provides a list of suggested stakeholder groups.

Welfare is the collection of the current and future value enjoyed by stakeholders. While welfare consists of various dimensions, the two welfare dimensions that are covered in the IWAF are stakeholder well-being and stakeholder rights. Welfare creation comprises the value enjoyed by stakeholders and the change in expected future welfare during a set timeframe. A complete set of valuable outcomes (Primary Valuable Outcomes[5] and Secondary Valuable Outcomes[6]) comprises the measurable indicators that, when seen together, reflect the welfare of society.

3.2 Impact and associated concepts

Impact is a valuable and measurable outcome change that affects the welfare of an organisation's stakeholders concerning a reference scenario during a given timeframe. In the context of IWAs, each change in outcome is called 'an impact', and such an impact is often referred to in a countable manner.

Material impact information is information regarding an organisation's impact that, if omitted, misstated, or obscured, could influence decisions that users make based on an organisation's IWAs. Based on useful impact information, organisations and their stakeholders can compare and rank various options according to their preferences, based not only on

[5] Primary valuable outcomes are indicators related to well-being that is enjoyed, rights that are breached, and/or outcomes associated with other welfare dimensions.

[6] Secondary valuable outcomes are indicators related to the quality or quantity of assets that determine future primary valuable outcomes.

financial value but also the creation or reduction of welfare for other stakeholders. Useful impact information enables informed decisions based on a broad, heterogeneous set of stakeholders who may differ in how much weight they attach to different impacts.

The general qualitative characteristics of useful impact information include information that is relevant, faithful,[7] comparable, consistent, verifiable, timely, and understandable. In terms of impact specific characteristics, useful impact information is welfare-based, goal- and function-oriented, complete in all material aspects, expressed in quantitative terms, attributed to the (reporting) organisation, valued in a commensurable unit, able to distinguish between choices ('sufficient resolution'), able to provide comparison among various choices ('sufficient additivity') and able to inform stakeholders who have different preferences ('sufficient distinction').

4. Statements of Impact-Weighted Accounts

Under the IWAF, Impact-Weighted Accounts (IWAs) are line items (in monetised terms) on a financial statement such as an income statement or a balance sheet, and are added to supplement the statement of financial health and performance to create a complete and holistic picture of the organisation's overall positive and negative impacts on employees, customers, the environment, and broader society. This section discusses how IWAs can be used by organisations, and then presents a description of the different types of IWA Statements to report the complete picture of the impact of an organisation.

4.1 Four general organisational objectives and different reporting statements

The IWAs can be used to report about the progress of the organisation towards general organisational goals and functions as well as those that are specific to its context. Context-specific goals can be related to the organisational mission or can be specific to jurisdiction, region, and sector.

IWAs provide impact information regarding the following four general organisational goals and functions that are common to each organisation.

Create value for society and its stakeholders

An organisation creates value for a stakeholder if it increases the welfare of that stakeholder on each welfare dimension. To evaluate value, an organisation may aggregate various impacts over individual stakeholders or stakeholder groups as long as no material information is hidden in this way. This goal has both an absolute and a marginal component.

[7] Being faithful means that it provides an accurate representation of the economic and societal phenomena and their impact.

Ideally, an organisation creates value to all its shareholders in an absolute sense and to a higher degree than realistic alternatives.

Act sustainably by operating within planetary and social boundaries

An organisation operates within the planetary (environmental) boundaries if it does no environmental harm nor breaches any environmental rights. An organisation operates within the social boundaries if it respects all human and other essential rights. Deviations from environmental and social boundaries can be captured by the external environmental and social costs an organisation imposes on its stakeholders. This goal is an absolute one: an organisation is sustainable if it respects these boundaries in an absolute sense.

Contribute to sustainable development according to the SDGs

Organisations considering their ESG impacts aim to contribute to sustainable development as defined by the United Nations Sustainable Development Goals. This goal is relative to whether an organisation contributes to a reduction of negative sustainability impacts and an increase of positive sustainability impacts.

Manage long-term value creation potential to meet responsibilities to all stakeholders over time

The final general organisational goal and function of an organisation is to manage long-term value creation potential and meet responsibilities to all stakeholders over time. This is an absolute goal.

IWAs contain two types of accounts: Integrated Profit & Loss (IP&L) Accounts and Integrated Balance Sheet (IBS) Accounts. Each account contains its own statement and its derivatives. An organisation can use specific statements derived from the IP&L Statement to report about its progress towards the four general organisational goals and functions as discussed earlier. Specific derived statements to the IP&L Statement include: the Stakeholder Value Creation Overview and two Sustainability Statements (the first focusing on External Costs and the second on Sustainable Development Goals). Figure 1 describes the relationship between different statements and organisational objectives.

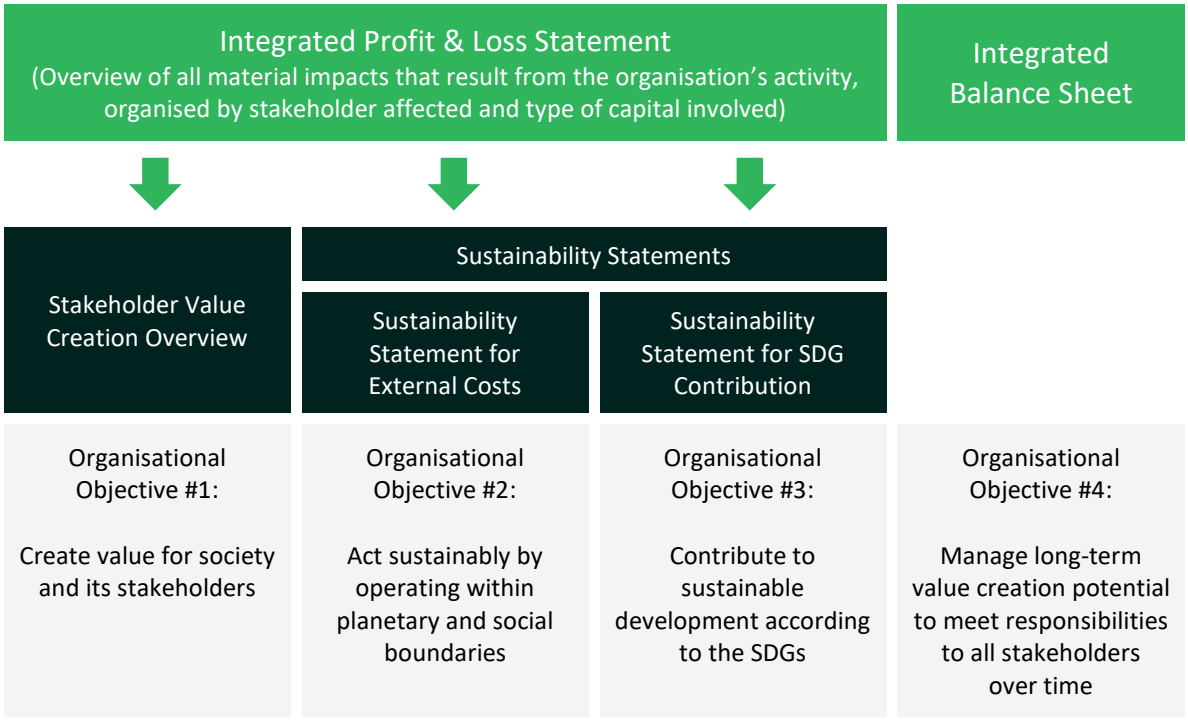


Figure 1: Statements of the Impact-Weighted Accounts and their relations to four organisational objectives from 'Conceptual Framework for Impact-Weighted Accounts.:Expert Consultation Draft' (2021)

4.2 Integrated Profit & Loss Accounts[8]

The Integrated Profit & Loss (IP&L) assessment is central to IWAs. The Integrated Profit & Loss Statement, which is derived directly from the IP&L assessment, provides information about an organisation's ability or inability to generate long-term value by increasing positive impact, reducing external costs, or both. It is presented in a table that shows all material impacts of the organisation that were realised during the reporting period, where the impacts are quantified, valued, and attributed to the organisation and classified according to capitals and stakeholders.

The presentation of the IP&L Statement

A reporting organisation can use a multi-capital, multi-stakeholder table to present its IP&L Statement. Figure 2 shows an example of the IP&L Statement presented using a table.

[8] The statement is called 'integrated' because the IP&L combines financial, social, natural, and other capitals in an integrated manner. In addition, the statement integrates the impacts on different stakeholders.

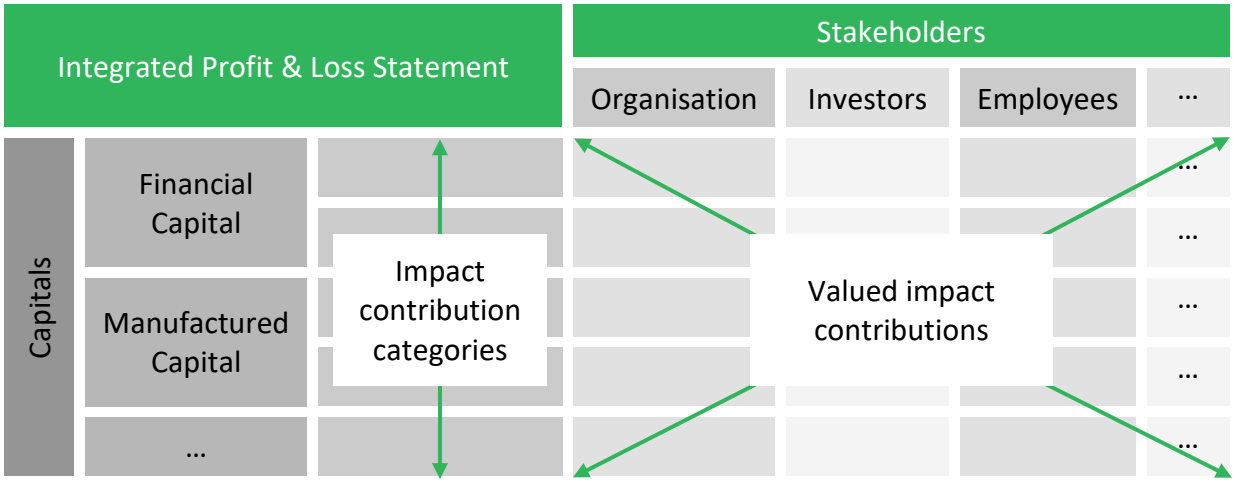


Figure 2: The presentation of the IP&L Statement from 'Conceptual Framework for Impact-Weighted Accounts: Expert Consultation Draft' (2021)

It is recommended to place the different stakeholders in the columns of the table and impact contribution categories[9] ordered by capital in the rows of the table.

Each **cell in the table** contains the sum of each valued impact contribution of all IP&L Account impacts belonging to the corresponding impact group,[10] capital, stakeholder group, and year. Each **row in the table** contains an impact contribution category.[11] Where possible, negative impacts belonging to the stakeholder rights welfare dimension are **not netted** against positive impacts. The organisation shall include impact contribution categories associated with all impact categories contained in the Standardised List of Impact Categories in its IP&L Statement, as well as all additional impact categories that are material to the organisation. If impact categories are demonstrably not applicable or material to the organisation, the

[9] Impact contribution categories can be defined in relation to impact categories as combining effects on different stakeholders or capitals. An example of an impact category that includes impact groups focusing on different stakeholders is 'Effects on human health'. It may contain effects on employees, consumers, and society-at-large. An example of an impact category that includes impact groups focusing on different capitals is 'Client value of services'. It may be classified as manufactured, human, or intellectual capital depending on the exact nature of the service.

[10] Examples of how impact groups are constructed from impacts include: 1) If an organisation performs several operations that each emit greenhouse gases, they can draw multiple Impact Pathways and have several impacts around 'Contribution to climate change' in the IP&L Accounts (i.e., 'Contribution to climate change from Operation A', 'Contribution to climate change from operation B', etc.). These can then be combined into an impact group, 'Total contribution to climate change'. 2) An organisation may have a direct impact associated with 'Contribution to climate change' (i.e., associated with its own operations) as well as an indirect impact (e.g., associated with the activities of their suppliers). Combining these two gives an aggregate at the impact group level).

[11] Examples of lines in the IP&L table include:1) For 'Contribution to climate change' there is a non-zero value in the column of stakeholder group 'society-at-large'. In all other columns there are zeros (no relevant value for this stakeholder group). 2) For 'Effects on human health', there are non-zero values in the columns of 'employees', 'consumers', and 'society-at-large', collectively providing information on the full impact contribution category.

organisation may exclude reporting on such impacts and disclose this exclusion. The process of compiling and using IWAs is discussed in greater detail in Section 5.

The organisation shall disclose in the IP&L Statement and its notes preferably: 1) **absolute impact contribution**, 2) **marginal impact contribution**, and 3) **total impact contribution**. If disclosing the total impact contribution is not feasible, the organisation may also choose only to disclose its **absolute impact contribution**. The organisation shall also provide the **sums** of the valued impact contributions per stakeholder and per capital over each year.[12] See Annex A for a standardised list of impact categories.

4.3 Stakeholder Value Creation Overview

The Stakeholder Value Creation Overview is a subset of the IP&L Statement and contains stakeholder-based impact information. It reflects the overall value creation of the organisation for each of its stakeholders through all the material impacts of the organisation's inputs and outputs, and can be presented by capital and by stakeholder. It is not necessary to make new calculations at the impact level in the Stakeholder Value Creation Overview when using the IP&L Statement as a source; impacts can be 're-used' from the IP&L Statement. The same is applicable to other statements such as Sustainability Statement for External Costs, and Sustainability Statement for SDG Contribution.

4.4 Sustainability statements

Two other sub-statements can be derived from the IP&L Statement to obtain sustainability information about the reporting organisation's activity-related externalities and its contribution towards Sustainable Development Goals (SDGs). Much of sustainability relates to the stakeholder rights welfare dimension, which captures the degree to which an organisation respects the environmental and human rights of current and future generations.

Sustainability Statement for External Costs

The Sustainability Statement for External Costs is a statement that captures information on the absolute social and environmental costs to which the organisation contributed and/or for which it shares value chain responsibility. It reflects the ability or inability of an organisation to minimise the external costs of its activities and to overcome them. An environmental or social cost is a negative impact on a stakeholder that breaches a stakeholder's right. An example of external cost is the cost of pollution to the environment or to the health of individuals during a production process. These costs are not reflected in the price of the product and are therefore

[12] See Section 6 for full descriptions of the types of impact contribution

considered external costs. The organisation is advised to report the statement by capital and by stakeholder, and to present its external costs in both the common and customary units.

Sustainability Statement for SDG Contribution

The Sustainability Statement for SDG Contribution is a statement that shows an organisation's contribution to the United Nations Sustainable Development Goals (SDGs) through its marginal impact on each SDG.

To develop the Sustainability Statement for SDG Contribution, the impacts in the IP&L and the SDGs are mapped onto each other. The mapping process is preferably conducted at the SDG indicator level, at the SDG target, or SDG goal level.[13] This statement is beneficial when tracked over time as it shows how contributions evolve as the organisation steers on specific SDGs. It also enables an organisation to compare its contribution to the SDGs against its peers in its sector.

In the impact context, the organisation explains actions it has taken to improve its contribution to specific SDGs and indicate the SDGs on which it focuses, while explaining how this aligns with the organisation's vision, mission, or Key Performance Indicators (KPIs). If an organisation's contribution to a specific SDG is less than what it was in the previous year, the organisation should explain the reason behind this decrease in accompanying notes.

4.5 Integrated Balance Sheet

In addition to statements derived from the IP&L Accounts, there can be statements in the IWAs that are derived from the Integrated Balance Sheet (IBS) Accounts.

The IBS is a statement to inform the users of IWAs of assets and liabilities that affect their ability to create long-term value for all stakeholders, as well as their responsibilities towards their stakeholders. The IBS Account concept is currently less developed than the IP&L Account. However, the concept provides several promising avenues for future research paths. Compiling and disclosing statements based on the IBS Accounts is currently optional within the IWAF as it is still under development.

5. Stages involved in compiling Impact-Weighted Accounts (IWAs)

Dozens of organisations are already experimenting with IWAs; many of these are included in Harvard Business School's 2021 list.[14] In compiling IWAs, the organisation measures impacts quantitatively and reports on them. The process helps the organisation to understand what impacts it could assess and report on, select the most relevant and important

[13] The full list of 17 SDG goals and indicators can be found in 'Transforming our world: The 2030 Agenda for Sustainable Development'

[14] The Opportunity - Impact-Weighted Accounts - Harvard Business School (hbs.edu)

impacts, and then analyse them in detail. This process of compiling, assessing, and reporting on IWAs typically follows a well-defined, four-stage process: 1) Frame, 2) Scope, 3) Measure and value, and 4) Report. These four stages are followed by a fifth stage, Act, where the organisation steers on impact and takes action based on the results of its IWAs; this stage is out of the scope of this framework. Not all stages and steps will be followed to the same degree of detail in every reporting period and, in practical scenarios, the process can be more iterative than the model described below. Figure 3 illustrates the process.

Stage 1: Frame

This first stage of the compiling process begins with the organisation identifying (if it is the first time it is compiling IWAs) or revisiting (if IWAs have been compiled previously) the rationale for measuring and reporting its impact. This can include reflecting on the organisation's theory of change, strategy (including sustainability strategy), system boundaries relevant to its activities, and potential business applications of reporting on the IWAs.

Stage 2: Scope

This stage aims to define the objectives and boundaries of the organisation's IWA assessment. Central to this stage are materiality and feasibility assessments, to ensure that the assessment results in valuable insights about impact information for both the organisation and the users of the IWAs.

Stage 3: Measure and value

This stage aims to quantitatively measure all impact based on the scope defined in Stage 2. This entails creating Impact Pathways for each impact in the scope, collecting data, and creating quantitative models to measure and value impact. Additional details about how to assess and value impact can be found in Section 6. This stage also involves organising impact information relative to each element of the IWA: Integrated Profit & Loss Statement, Stakeholder Value Creation Overview, Sustainability Statement for External Costs, and Sustainability Statement for SDG Contribution, all of which have been discussed in Section 4.

Stage 4: Report

This stage aims to interpret and verify the process involved, generate results, and disclose these results internally or to the public. The organisation ensures that all impact information about to be disclosed satisfies the criteria of material impact information. Specifically, the organisation has to demonstrate connectivity of its impact information, by showing how the components in the impact information are interrelated and dependant on its comprehensive value creation model.

Stage 5: Act

The final stage of an IWA project focuses on steering on impact. Useful impact information in the IWAs can influence management's actions that eventually affect the organisation's KPIs and strategy. This can help the organisation to optimise value creation for its stakeholders and ensure that it is sustainable. However, IWAF does not offer concrete guidance on how to steer on impact but focuses on guiding organisations in the first four steps.

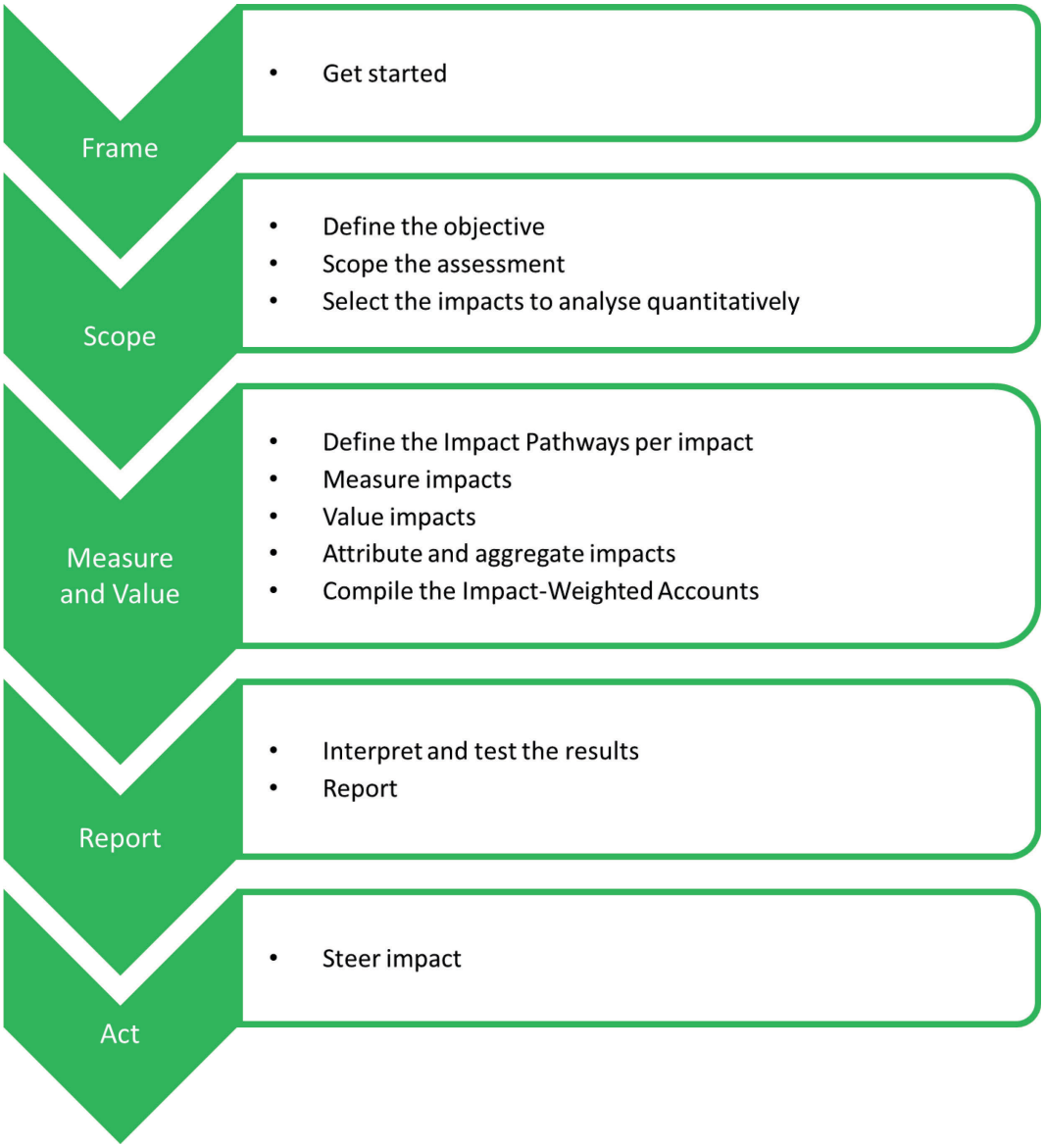


Figure 3: A schematic of the stages in compiling and reporting Impact-Weighted Accounts, Adapted from Natural Capital Coalition (2016)

6. Impact Pathway

An Impact Pathway is a quantifiable chain of effects and counterfactual effects that link an organisation's specific activity to its effect on a valuable outcome. The Impact Pathway can show how specific outputs of organisational activity lead to outcomes and then to impacts; these are called 'impacts mainly associated with outputs'. Other impacts are mainly associated with the use of inputs by the organisation. The following figure illustrates the Impact Pathway and its building blocks.

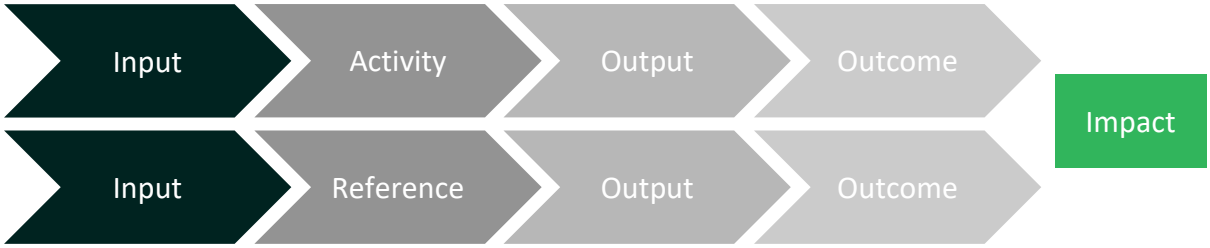


Figure 4: The Impact Pathway (Adapted from Impact-Weighted Accounts Framework Consultation Draft 2021)

Figure 4 (above) focuses on an impact that is mainly associated with an output. Impact Pathways that are mainly associated with the use of inputs are also possible. An **input** refers to the resources used in the organisation's activity. This activity includes the actions taken by the organisation. A **realised activity** is an activity the organisation has realised in the reporting period, while a **projected activity** is a forecasted activity the organisation will realise in the future. A **reference activity** is an activity that would have otherwise occurred in the chosen timeframe had the organisation not undertaken the actual activity. An **output** is any direct effect of the organisation's activity during the reporting period, and which is not an input. An **outcome** of an activity of the organisation reflects the direct or indirect welfare effects of the outputs.

An **impact** of an activity is the difference of a valuable outcome of a realised activity, seen in opposition to the counterfactual outcome in the reference activity. A **positive impact** refers to a positive change of a capital stock, a positive change in the well-being of a stakeholder, or a prevention of the breach of a right (compared to the reference scenario). A **negative impact** refers to a negative change of a capital stock, a negative change in well-being for a stakeholder, or the breach of a right (compared to the reference scenario).

The organisation shall define Impact Pathways in line with conventions in the sector and region it is active in insofar as these exist and are applicable. It shall aim to apply the

Impact Pathways consistently over multiple years and periodically test whether the Impact Pathways are still relevant.

6.1 Attributed and aggregate impacts

An impact can typically refer to the direct impact of one organisation or the indirect impact of multiple organisations. Impact attribution refers to the way in which impact is distributed based on the responsibility of each organisation. An attributed impact is a weighted impact that reflects the contribution of a particular organisation to the impact. The organisation shall attribute a share of each impact, together with other organisations in its value chain or system. Impact is attributed in a way that ensures that sum of the attributed impact of each organisation is equal to the original impact (with no double counting or undercounting).

The impact contribution is a measure of the overall attributed impact of an organisation. It is a linear combination of the four types of impact: 1) direct absolute impact, 2) direct marginal impact, 3) indirect absolute impact, and 4) indirect marginal impact.

A **direct impact** of an organisation is an impact caused directly by the organisation's operations. An **indirect impact** of an organisation arises outside the organisation itself whereby the organisation's activities exert a direct or indirect influence on the occurrence and/or size of that impact.

An **absolute impact** is the impact generated by an organisation's activities compared to a no-alternative reference scenario in which no activities occur. A **marginal impact** is the additional impact generated by the organisation's activities compared to a scenario where alternative activities continue in the organisation's absence.

The absolute impact contribution is a linear combination of direct and indirect absolute impact. The marginal impact contribution is a linear combination of direct and indirect marginal impact. The total impact contribution is a linear combination of all four types of impact. Figures in the IP&L Statement shall reflect the organisation's absolute or total impact contribution for each IP&L account. Figure 5 summarises these different types of impact.[15]

[15] The figure is modified from 'Integrated Profit & Loss Assessment Methodology (IAM): Supplement Impact Contribution' (Figure 5: Four types of impact), compiled by Impact Institute

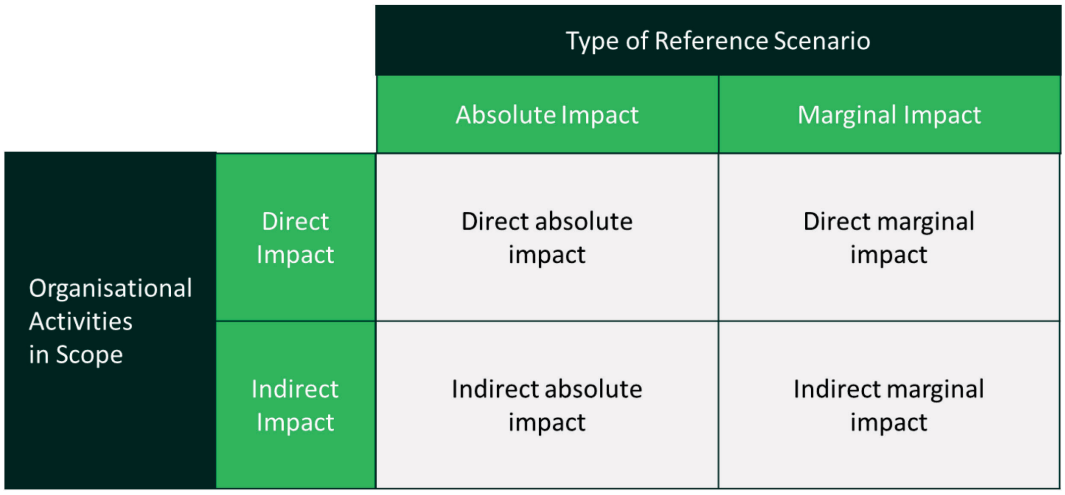


Figure 5: Different types of impact

6.2 Benefits of Impact-Weighted Accounts

Impact-Weighted Accounts can help reporting organisations in various ways, including retaining their social license to operate, steering on purposeful and intentional impact, better understanding internalisation risks and acting upon them, understanding the value of their impact, and meeting transparency expectations of stakeholders. Early adopters of IWAF are also better prepared for the future of corporate reporting. They benefit from a first-mover advantage in having an early opportunity to experiment and benefit from the insights provided, while securing a leadership position in the industry.

In the long term, reporting impact in a measurable way with a common language provides executives with an extra decision-making tool to anticipate short-term market pressure in the investing world. This allows them to justify investing in long-term value creation. There are some investments for which impact would be realised in the mid- or longer-term at the expense of near-term profit for the organisation (just like any other positive net present value investment). These trade-offs would become apparent with impact reporting such as IWAs. Understanding these would enable executives within the reporting organisations to make sound decisions, and steer on impact that aligns with the organisation's long-term value creation proposition, vision, and mission.

IWAs also offer other benefits. They can help investors understand long-term value creation for all stakeholders of the reporting organisation, assess the likelihood and speed of internalisation, and receive additional insight into the long-term financial viability of the reporting organisation. In addition, IWAs can inform organisations about value creation for

other stakeholders, such as clients, employees, governments, NGOs, society at large, the environment, etc. In addition, these groups of stakeholders can engage organisations or the public sector to stimulate equitable value creation.

Finally, IWAs offer the benefit of enabling effective impact statements that boil down hundreds of sustainability indicators into a small set of measurable goals, enabling organisations to make trade-offs between the many ways in which they affect society and various stakeholders' interests, as well as between short- and long-term action. At the same time, effective impact statements provide sufficient information for organisations and their stakeholders to set their priorities for impact.

7. Methodology and application of impact measurement

This section shares examples that illustrate how an organisation can apply the IWAF to its impact measurement. This includes monetisation factors on impact indicator level, using True Price (2020) or the best available sources.[16] Table 1 presents monetisation examples of six capitals that can be applied in the impact measurement process. Incorporating the monetisation factors enables organisations to add or subtract the impact in different capitals and get a holistic view of how the entity performs from a wider stakeholders' perspective.

Table 1: Monetisation Examples of Six Capitals

Impact	Capital	Footprint Indicator	Monetisation Factor	Explanation
Profit	Financial	Net profit/loss	1 dollar/dollar	Impact is often already expressed in a currency unit. To translate it to dollar-equivalents, it is assumed that one dollar of financial value is equal to one dollar-equivalent of well-being. In addition, one dollar can represent more well-being for one stakeholder than for another.

[16] For a more comprehensive list of the monetisation factor on impact indicator level, please refer to 'Impact-Weighted Accounts Framework, Expert Consultation Draft' (July 2021)

Table 1 (continued)

Impact	Capital	Footprint Indicator	Monetisation Factor	Explanation
Client value of products	Manufactured	Client value of products	1 dollar/dollar	Impact is often already expressed in a currency unit. To translate it to dollar-equivalents, it is assumed that one dollar of financial value is equal to one dollar-equivalent of well-being. In addition, one dollar can represent more well-being for one stakeholder than for another.
Creation of intellectual capital	Intellectual	Creation of intellectual capital	1 dollar/dollar	Impact is often already expressed in a currency unit. To translate it to dollar-equivalents, it is assumed that one dollar of financial value is equal to one dollar-equivalent of well-being. In addition, one dollar can represent more well-being for one stakeholder than for another.
Well-being of employment	Human	Well-being effect per one additional point of life satisfaction	2.217 dollar (in 2019)/life satisfaction point (Scale 0-100)	The value of well-being is based on two studies. A value of well-being was derived from both studies, each of which was adjusted for inflation and PPP. These values are based on a reduction in well-being value due to unemployment and an increase in well-being value due to education. These two values were weighted equally to arrive at the final life satisfaction point.
Contribution to, or limitation of, climate change	Natural	Greenhouse gas (GHG) emissions	0.152 dollar/kgCO2 eq	A restoration cost which expresses the abatement cost for achieving the policy targets of reducing greenhouse gas emissions to meet the 2-degree target as set in the Paris Agreement, based on a meta-study of 62 marginal abatement cost estimates.
Contribution to, or limitation of, poverty: Insufficient income	Social	Income gap	1.49 dollar/dollar	A compensation cost that represents the restitution of the income gap.

8. Why is impact measurement important in the context of Asia?

8.1 The landscape of Asian economies

Asian economies are projected to suffer the harshest effects of climate change without adaptation and mitigation measures. According to the most recent Sixth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC), Asia will be hit by extreme weather events with higher temperatures and rising sea levels.[17] Singapore, in particular, has warmed 80 percent faster than the rest of the region over the past 70 years, and many low-lying coastal cities in Asia have been exposed to flood and typhoon risk, with dramatic increases in heat and humidity expected across the region, and extreme precipitation forecast in some areas but drought anticipated in others. IPCC's latest findings also suggest that rising water levels are estimated to cost Asia's major cities billions in damage this decade given that, for example, Indonesia has one of the world's longest coastlines at 54,700 kilometres. While governments in the region's countries are working with businesses to meet more ambitious climate targets, the region can also leverage both public institutions and private investors to address climate challenges. In addition, besides environmental challenges, Asian countries also face many significant challenges in social issues such as increasing inequality, lack of quality education for children, extreme poverty, human rights violations, and other forms of social injustice.

Over the years, impact investing — an effective tool to address the climate emergency and severe social issues — has continued to gain traction in Asia.[18] However, it is clear that Asia is unique in its climate and social challenges, and a universal impact assessment and measurement framework that works in the United States or Europe may not work in Asia. At the same time, countries within Asia may also differ in their climate and social emergencies. For instance, while many human rights issues remain inadequately addressed in Asia compared to the United States and Europe, issues concerning human trafficking and child labour are less common in Singapore than in other countries in Asia. Even for global warming for which the measure is relatively objective, many scholars have tried to estimate the monetary value of CO_2 emissions but no consensus has yet been reached. For example, in 2021, the Biden administration raised the social cost of carbon to US$51 per ton, while the social cost of carbon was around US$1 to US$7 per ton under the Trump administration. In Asia, we have seen more

[17] Ministry of Sustainability and the Environment (Singapore) Press release 'IPCC's Latest Findings Suggest Increased Warming, More Changes In Extreme Weather Events With Higher Temperatures And Global Sea Level Rise' (9 August 2021) Available at: https://www.mse.gov.sg/resource-room/category/2021-08-09-press-release-ipcc-findings-more-changes-in-extreme-weather-events/

[18] Elevate 'Impact investing in Asia – latest trends and challenges' (2019)

initiatives in this area recently, and a big difference in the price of CO_2 compared to the United States and Europe. On 16 July 2021, China officially launched the world's largest national Emissions Trading Scheme (ETS). The price on opening day was 49 yuan per ton, or US$7.6 per ton. According to a non-profit survey by the Chinese business media Caixin, carbon credits will likely be traded around 71 yuan per ton in 2025 and 93 yuan per ton by 2030. In 2021, Singapore is introducing Climate Impact X (CIX), a global carbon credits exchange and marketplace, to scale the voluntary carbon market. These economic, social, and environmental disparities between the economies of Asia, Europe, and the United States strongly suggest the need to adapt the IWAF for more targeted climate and social solutions in Asia.

8.2 Possible extensions of IWAF to Asia

Central to IWAF's impact assessment method are impact factors and monetisation factors. Under the current approach of the framework, impact factors are taken from the ReCiPe Impact Assessment method,[19] and the monetary factors are obtained from the CE Delft Environmental Prices Handbook, European Social Services, and TEEB. Given that the model depends heavily on the European or OECD database, Asian organisations and investors should refer to the World Bank database or country-level reports. Similarly, the monetisation process under the IWAF is less Asia-focused. The current approach uses monetisation factors to convert impact data into monetary units and the current conversion methodology uses remediation of external costs and well-being effects valuations based on the Europe-based CE Delft Environmental Prices Handbook, European Social Services, and TEEB, many of which may not be applicable to the Asian context. Thus, more discussion for geographical contextualisation is recommended. One example is the application of the impact monetisation model to obtain insights into external costs involved in manufacturing (e.g., jeans production in Bangladesh and India). However, it is unclear whether monetisation factors are country specific.[20]

With regard to the generalisability of the approach, the data and methodology used by IWAF are useful for monetising social and environmental impacts and integrating them into financial statements. However, to apply such a framework to Asia, organisations and investors need to consider social externalities (e.g., how human rights such as minimum wage and labour

[19] Full details about ReCiPe Impact Assessment method are available at: https://www.springerprofessional.de/en/recipe2016-a-harmonised-life-cycle-impact-assessment-method-at-m/11919942

[20] Impact Institute 'The True Price of Jeans' (2019) Available at: https://www.impactinstitute.com/true-price-of-jeans/

rights are respected) and regulatory differences (e.g., how carbon emissions are treated and reflected in costs). As mentioned in Section 7.1, such differences can be substantial across different legal systems and market conditions. To that end, customising an Asia-focused IWAF is an ongoing process that requires collective inputs from industry partners.

9. Initiatives taken by SGFC on ESG & impact measurement and standards

Since the launch of the Singapore Green Finance Centre (SGFC), Prof. Dave Fernandez and Prof. Liang Hao have participated in a commissioned project to provide a technical review of two pilot studies on measuring the impact of bank lending to two sectors: palm oil and automotive. Using a methodology based on the impact monetisation described above, studies were successfully completed in collaboration with Impact Institute. Following these studies, a partnership was formed with Impact Institute to participate in the Banking Impact Working Group.

SGFC has also participated in the co-development of IWAF. IWAF is incubated, in an inclusive and scientific process, by the Impact Economy Foundation and developed together with Harvard Business School's Impact-Weighted Accounts Initiative, Singapore Management University, the Rotterdam School of Management, and Impact Institute. Prof. Dave Fernandez is on the academic council of the IWAF, and Prof. Liang Hao is a member of the working group that develops drafts for the IWAF.

SGFC has also organised a panel discussion presented by leading experts on ESG Measurements & Standards (as part of GRASFI Annual Conference Side Event) on 31 August 2021, moderated by Prof. Dave Fernandez and Prof. Liang Hao. The six experts include practitioners, academics, and regulators in this field: 1) Dave Chen, CEO/Chairman, Equilibrium and Adjunct Professor of Finance, Northwestern University - Kellogg School of Management; 2) Adrian De Groot Ruiz, Executive Director, Impact Institute; 3) Wong Dan Chi, Head of ESG Integration, APAC, Schroders and Adjunct Faculty, Singapore Management University; 4) Andrew King, Questrom Professor in Management, Boston University; 5) Shawn Cole, John G. McLean Professor of Business Administration, Harvard Business School; 6) Michael Tang, Head of Listing Policy & Product Admission, Singapore Exchange (SGX).

In conjunction with Impact Institute, SGFC has also formed a working group for ESG and impact measurements with industry partners, particularly to discuss the need for an Asia-focused approach to implementing impact measurement. The meeting was held on 23 November 2021. We have received comments and input from our founding partners such as

Bank of China, HSBC and UBS, indicating a great need for a standardised framework with a localised perspective on certain parameters.

10. Related readings

'Conceptual Framework for Impact-Weighted Accounts: Expert Consultation Draft' (2021) Available at: https://impacteconomyfoundation.org/impactweightedaccountsframework/

'Impact-Weighted Accounts Framework' Available at : https://impacteconomyfoundation.org/impactweightedaccountsframework/

'Integrated Profit & Loss Assessment Methodology (IAM): Supplement Impact Contribution' Available at: https://www.impactinstitute.com/ipl-assessment-methodology/

Liang, H., Fernandez, D., Larsen, M, 'Impact Assessment and Measurement with Sustainable Development Goals, Sim Kee Boon Institute Working Paper' (2021) Available at: https://skbi.smu.edu.sg/research/research-outputs/impact-measurement

Liang, H., Nguyen, T.B. P, 'Technical Review: Impact Measurement Project' (2020) Available at: https://skbi.smu.edu.sg/research/research-outputs/technical-review-impact-measurement

Natural Capital Coalition, *Natural Capital Protocol Principles and Framework* (2021) Available at: https://naturalcapitalcoalition.org/wp-content/uploads/2018/05/NCC_Protocol_WEB_2016-07-12-1.pdf

Annex A: Standardised List of Impact Categories[21]

The set of impacts that are material to the organisation and thus appear in the Impact-Weighted Accounts (IWAs) depends on the type of business activity of the respective organisation. Table A.1 provides the standard list of impact categories that are relevant to many types of organisations. It is suggested that these impact categories should always be included in IWAs if these are material to the organisation. Please note that this list is not exhaustive.

The list specifies the type of capital and the stakeholders with which an impact category is associated. If a different classification of stakeholder groups is used, the organisation should modify the list accordingly. The list also provides the possible valences for the accounts in the impact categories. The valence of impact is defined from the perspective of the stakeholder external to the organisation in scope. In addition, the list indicates whether an impact is typically an input or an output, and the welfare dimension to which the impact relates.

Table A.1. Key Impact Categories

Impact	Description	Capital	Stakeholders	Valence (for absolute impact)	Welfare Dimension
Profit	Profit made by the organisation	Financial	Organisation, Investors	Positive	Well-being
Salaries	Salaries and other comprehensive benefits paid to employees by the organisation	Financial	Employees	Positive	Well-being
Interest payments	Interest payments to an organisation's lenders and bond holders	Financial	Organisation, Investors	Positive	Well-being
Taxes	Taxes paid to the government by the organisation	Financial	Governments, Local Communities, and others	Positive	Well-being

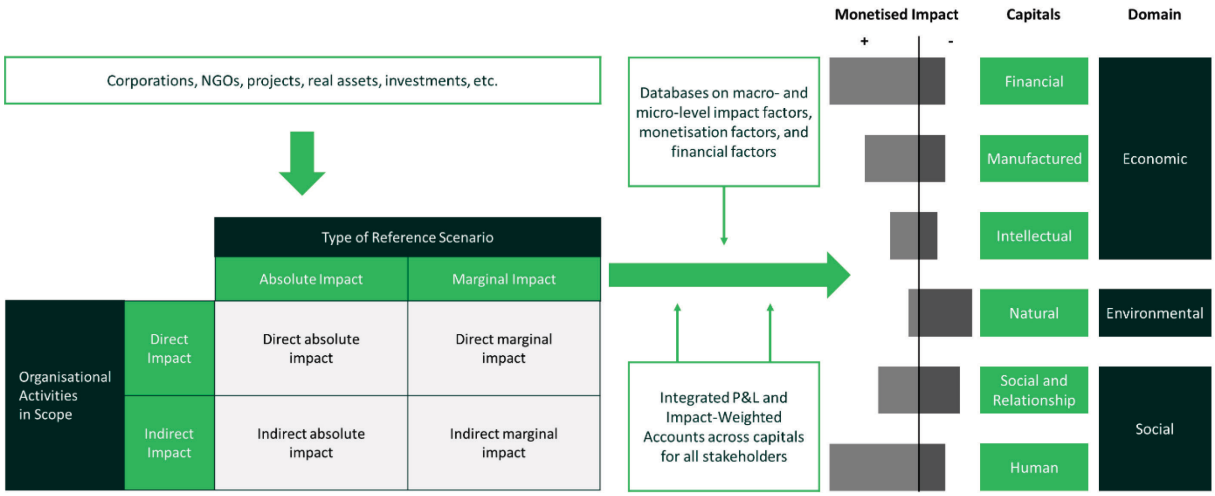
[21] Impact Economy Foundation, 'Conceptual Framework for Impact-Weighted Accounts: Expert Consultation Draft' (2021)

Payments to suppliers	Payments to suppliers by the organisation	Financial	Suppliers	Positive	Well-being
Payments from clients	Payments from clients to the organisation	Financial	Clients	Negative	Well-being
Cost of capital	The cost of the capital that is provided to the organisation by equity holders, bond holders and others	Financial	Investors	Negative	Well-being
Change in fixed assets	A change in the fixed assets of the organisation (e.g., due to new investments, divestments, and depreciation)	Manufactured	Organisation, Investors	Positive or Negative	Well-being
Client value of products	Value to clients of products sold by the organisation	Manufactured	Clients	Positive	Well-being
Client value of services	Value to clients of services sold by the organisation	Manufactured/ Intellectual/ Human	Clients	Positive	Well-being
Value of input materials	Value of input materials supplied by suppliers to the organisation	Manufactured	Suppliers	Negative	Well-being
Creation of intellectual capital	Creation of intellectual capital such as new knowledge and technology by the organisation	Intellectual	Organisation, Investors	Positive	Well-being

Well-being of employees	Additional well-being experienced by employees due to their employment at the organisation	Human	Employees	Positive	Well-being
Creation of human capital	Increase in skills and associated human capital of employees due to their employment at the organisation	Human	Employees	Positive	Well-being
Effects on human health	Various effects on human health associated with the operations and products of the organisation	Human	Employees, Clients, Governments, Local Communities, and others	Positive or Negative	(Mostly) Well-being
Occupational health & safety incidents	The effects of occupational health & safety incidents that occur during the operations of the organisation	Human	Employees	Negative	Rights
Time invested by employees	The value of time invested by employees to work for the organisation	Human	Employees	Negative	Well-being
Contribution to, or limitation of, climate change	Emission or absorption of greenhouse gasses during the operations of the organisation	Natural	Nature and its beneficiaries	Positive or Negative	(Mostly) Rights

Contribution to, or limitation of, pollution	Emission or absorption of pollutants into air, soil, and water during the operations of the organisation	Natural	Nature and its beneficiaries	Positive or Negative	(Mostly) Rights
Contribution to, or limitation of, availability of scarce natural resources	The effects of increasing or decreasing the scarcity of natural resources due to the operations of the organisation	Natural	Nature and its beneficiaries	Positive or Negative	(Mostly) Rights
Contribution to, or limitation of, poverty	The effects of increased or decreased poverty due to the operations of the organisation	Social	Employees, Clients, Governments, Local Communities, and others	Positive or Negative	(Mostly) Rights
Contribution to, or limitation of, human rights violations	The (indirect) contribution to human rights violations, or preventing others from engaging in this	Social	Employees, Clients, Governments, Local Communities, and others	Positive or Negative	(Mostly) Rights

Annex B: Conceptual Framework for Impact Measurement



Annex C: Research outputs by SGFC-affiliated SMU faculty members (bolded):

Dai, Rui and Duan, Rui and **Liang, Hao** and Ng, Lilian, 'Outsourcing climate change' (7 January 2021). *European Corporate Governance Institute – Finance Working Paper No. 723/2021*, Available at SSRN: https://ssrn.com/abstract=3765485

Duan, Tinghua and **Li, Frank Weikai**, 'Climate change concerns and mortgage lending' (27 April 2021). Available at SSRN: https://ssrn.com/abstract=3449696

Duan, Tinghua and **Li, Frank Weikai** and Wen, Quan, 'Is carbon risk priced in the cross-section of corporate bond returns?' (3 January 2021). Available at SSRN: https://ssrn.com/abstract=3709572

Jin, Zuben and **Li, Frank Weikai** and Lin, Yupeng and Zhang, Zilong, 'Do firms adapt to rising temperatures? Evidence from establishment-level data' (20 August 2021). Available at SSRN: https://ssrn.com/abstract=3573260

Liang, Hao and **Fernandez, Dave** and Larsen, M., forthcoming 2022, 'Impact assessment and measurement with sustainable development goals', in *Handbook on the Business of Sustainability: The Organization, Implementation, and Practice of Sustainable Growth*, Edward Elgar Press. https://ink.library.smu.edu.sg/lkcsb_research/6713/

Liang, Hao and Renneboog, Luc, 'The global sustainability footprint of sovereign wealth funds (15 December, 2019). *European Corporate Governance Institute – Finance Working Paper No. 647/2019*, Available at SSRN: https://ssrn.com/abstract=3516985

Liang, Hao and Sun, Lin and **Teo, Melvyn**, 'Responsible hedge funds' (26 May 2020). Available at SSRN: https://ssrn.com/abstract=3610627

Liang, Hao and Vansteenkiste, Cara, 'Disaster Relief, Inc.' (2 November 2020). *European Corporate Governance Institute – Finance Working Paper No. 709/2020*, Available at SSRN: https://ssrn.com/abstract=3727329

Merrill, Ryan K., **Schillebeeckx**, **Simon JD,** and Blakstad, Sofie, *Sustainable Digital Finance in Asia: Creating Environmental Impact through Bank Transformation* https://www.dbs.com/iwov-resources/images/sustainability/reports/Sustainable%20Digital%20Finance%20in%20Asia_FINAL_22.pdf