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The Proposed Formal Grounded Theory of Fishmining: Lack of Trust and Inadequate Multi-stakeholder Governance Drive Resources' Unsustainability

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Abstract

This study explores ways Tanzanian and European fisheries actors solve and resolve their main concern given the persistently ongoing unsustainability occurrences in the management and exploitation of fisheries resources. It used classic grounded theory (CGT) methodology to collect and analyse the data. Lack of trust, credibility, and inadequacies in public governance emerged as the main concerns that enabled local and foreign rogue actors to unsustainably overexploit fisheries resources. A core category and basic social process (BSP) called fishmining, emerged as fishmining BSP CGT, and met the requirements of a formal GT (FGT) because its general implications of unsustainability transcended the fisheries resources context into other resource-based spheres: management, geography/jurisdiction, legal/regulatory regimes, and many other sustainable development aspects of the United Nations. Also, this fishmining BSP FGT appeared to fit and work while keeping relevant and modifiable to new unsustainability situations given changes over time, people, and places.

Keywords: Trust loss, governance loss, resources unsustainability, fishmining basic social process, fishmining formal grounded theory

Background

Unsustainable exploitation of fisheries' resources is a widespread global phenomenon. For example, the United Nations missed its target of ending overfishing of marine resources by 2020 (Food and Agriculture Organization, 2020). This has led to an international agreement expanding, from 1.2% to 30% by 2030, the area of global oceans protected against unsustainability practices, including overfishing (Stallard, 2023). Although fish/seafood is recorded as the most traded food commodity in the world (Food and Agriculture Organization, 2014), about 90% of global fisheries are presently fully exploited, overexploited, or depleted, due to unsustainable and illegal, unreported, and unregulated (IUU) fishing practices (Food and Agriculture Organization, 2020). Moreover, Caton (2018) reports that fish supplies have significantly diminished at Dar es Salaam, Tanzania's largest fish market; and this has been blamed on overfishing in the country's territorial waters by large foreign owned, largely Chinese, but also European origin trawlers. These foreign actors have pushed the fishing limits beyond sustainable levels, thus depriving local fishers of catch (Sumaila et al., 2020). As a result, the local fishers have compensated for these shortfalls through catching younger fish, often by illegitimate means, thus worsening the fisheries' unsustainability problem (Caton, 2018; Petrossian & Pezzella, 2018; Domician, 2024).

While the preceding unsustainability challenges in fisheries are widespread and formally documented globally and in Tanzania, there is little evidence of how fishers and other actors solve and resolve their main concern (i.e., what is going on in the fisheries action scene). The preceding background illustrates that the fisheries development problems have been extensively researched, yet the unsustainability challenges still persist. Therefore, this study is motivated by the need to explore what is going on in the fisheries sector in terms of how actors (i.e., fishers

and other multi-stakeholders) solve and resolve the seemingly persistent unsustainability problem (i.e., illegal and unsustainable fishing practices).

Methodology

Data collection and analysis followed classic grounded theory (CGT) approaches (Belgrave & Seide, 2020; Glaser, 1978, 1992; Glaser & Strauss, 1967). Stakeholders were invited to discuss the 'development barriers and drivers that limit the fishing industry's sustainability and potential for scaling-up.' The CGT methodological framework involved four stages of data collection (theoretical sampling), open coding, selective coding, and theoretical coding that finally derived a GT. Also, the study employed four key GT principles namely theoretical sampling (i.e., data collection), constant comparative analysis (i.e., identifying similar and varying data patterns to ellicit emerging conceptual messages called conceptual incidental indicators (CIIs)), memoing (i.e., summarising conceptual meanings of the derived data patterns), and emergence (i.e., emerging concepts and main problem/concern in the action scene, hence the emergent GT) (Glaser, 1992; Walsh et al., 2020, pp.23-32). Memoing was undertaken continuously, as a mental and physical conceptual note-taking activity, during each of the four GT stages (Glaser, 1978, 1992). While memoing, the researcher derived theoretical meanings and patterns (CIIs) emerging from the collected data through a process of constant comparative analysis. CIIs are messages or patterns of messages that flag out or indicate problems (i.e., what is going on) in the fisheries action scene. These CIIs were used to frame the next set of stakeholder interviews, including the suggestion of questions to be examined in the next round of consultation. This next round of data collection is called theoretical sampling in GT. This sampling process stopped when saturation was reached. Similar CIIs were grouped and formulated into codes/categories (concepts) via a process called open coding; and these concepts

were aggregated further around the main problematic pattern (i.e., selective coding around one code - the core category - with the most CIIs). Finally, a theoretical code/concept was derived to represent the emergent GT that explained the main concern of actors in the fisheries sector, hence the emergence principle (Glaser, 1978, 1992). The emergent core category with the highest variation (i.e., number of associated CIIs) represented the main concern or problem facing the multi-stakeholders in fisheries.

To meet the GT methodological requirements, the sample size for the current study was not determined beforehand. Instead, the target stakeholders were identified first, namely fishers, regulators, processors/exporters, and industry experts/researchers in Tanzania; and a few traders/importers, distributors, and industry experts in the UK/EU. The study interviewed 195 Tanzanian stakeholders and five stakeholders in the UK/EU. Although the researcher had a list of general issues to explore in fisheries, this list was not put forward in advance but was used as a guide to seek more clarifications or as follow up questions. This is a key requirement in GT to allow an undistorted flow of stakeholder views with minimal or no interference from the researcher or extant literature (Glaser, 1992, 1998). This approach resulted in the identification of questions and issues which stakeholders themselves deemed to be critical and relevant to the topic of investigation. During the interviews, the identified stakeholders could voice issues that were potentially very different from those first envisioned by the researcher prior to fieldwork, but the stakeholders' views were by far the most relevant, as they naturally emerged from the data (Glaser, 1992). The study also undertook steps to establish the nature of the core category, to see if it constituted a Basic Social Process (BSP), which is defined by Glaser (1978) as a special type of core category that occurs in at least two processes, or stages, over time.

Findings

This section presents the findings of the study. These are both qualitative and quantitative in nature. They include derived concepts, the core category and its properties, and practical applications of the emerged grounded theory.

Emerging Conceptual Incidental Indicators (CIIs)

Tables 1 and 2 present the quantification of qualitative CIIs generated from this study. This quantification conveys a better understanding and simplified interpretation of the GT results to readers (Walsh, et al., 2020, p.75; Glaser, 2008, p.28). Table 1 presents a frequency distribution table for this study's 634 CIIs attained at a point where no new CIIs emerged from additional and further analysis of the data through the GT processes of theoretical sampling and constant comparative analysis. This point is known in GT analysis as full analytical saturation or 'full interchangeability' (Glaser, 1978, 1992). The CIIs frequency of occurrence table is presented in two parts: the first represents those CIIs that are favourable to the sustainable development of the fisheries sector in terms of plans and actions. The second part is about unfavourable CIIs that are indicative of unsustainability practices that worsen or hinder the sustainable development and commercial scaling-up of the fisheries sector. The overall finding (Table 1) is that CIIs favourable to sustainable fishing practices accounted for 24% only; and these were thematically grouped into and represented by the categories of Democratising Governance, Sustainable Fishing, and Socioeconomic Contribution. On the other hand, 76% of CIIs were unfavourable (i.e., they represented unsustainable fishing practices) and were thematically grouped under the categories of Trust Loss and Governance Loss. This suggests that slightly over three quarters of what is going on in the fisheries action scene mitigates against sustainable fishing practices.

Table 1

Frequency Distribution for Conceptual Incidental Indicators (CIIs), Codes and Categories

Category	Code	CIIs frequency of occurrence	Percentage
Positive/Favourable Conceptual Incidental Indicators (CIIs):			
Democratising Governance (DG)	Regulatory Enforcement	26	4.1%
	Human Capital	20	3.2%
	Participatory Representation	17	2.7%
Sub-Total: Democratising Governance (DG)		*63*	*10.0%*
Sustainable Fishing (SF)	Fishing Operations	13	2.0%
	Surveillance Routines	9	1.5%
	Fish Quality	9	1.5%
Sub-Total: Sustainable Fishing (SF)		*31*	*5.0%*
Socioeconomic Contribution (SC)	Levies Payment	25	3.9%
	Foreign Aid	13	2.0%
	Fish Sales	20	3.1%
Sub-Total: Socioeconomic Contribution (SC)		*58*	*9.0%*
Sub-Total: Favourable CIIs		*152*	*24.0%*
Negative/Unfavourable Conceptual Incidental Indicators (CIIs):			
Trust Loss (TL)	Human Undercapitalisation	40	6.3%
	Technology Gap	44	7.0%
	Traceability Inadequacy	42	6.6%
	Non-Cooperatised Fishing	52	8.2%
	Unbanked/Underbanked Fishing	36	5.7%
Sub-Total: Trust Loss (TL)		*214*	*33.8%*
Governance Loss (GL)	Data Corruption	31	4.9%
	Political Manipulation	34	5.4%
	Policy Confusion	45	7.1%
	Prohibitive Regulation	33	5.2%
	Corrupt Survival	20	3.2%
	Resources Unaccountability	25	3.9%
	Resources Profiteering	35	5.5%
	Globoverfishing	29	4.5%
	Petty Disguise	16	2.5%
Sub-Total: Governance Loss (GL)		*268*	*42.2%*
Sub-total: Unfavourable CIIs		*482*	*76.0%*
Overall Total		634	100.0%

Source: Author's own Table.

Table 2

Frequency Distribution of Unfavourable Conceptual Incidental Indicators (CIIs) Variations Between Freshwater & Marine Fisheries

Emerged concepts		Freshwater & Marine	Freshwater fisheries		Marine fisheries	
Categories	Codes	Total CIIs	No. of CIIs	% of CIIs	No. of CIIs	% of CIIs
Trust Loss (TL)	Human Undercapitalisation	40	4	10%	36	90%
	Technology Gap	44	12	27%	32	73%
	Traceability Inadequacy	42	22	52%	20	48%
	Non-Cooperatised Fishing	52	20	38%	32	62%
	Unbanked/Underbanked Fishing	36	16	44%	20	56%
Sub-Total: Trust Loss (TL)		*214*	*74*	*35%*	*140*	*65%*
Governance Loss (GL)	Data Corruption	31	7	23%	24	77%
	Political Manipulation	34	11	32%	23	68%
	Policy Confusion	45	19	42%	26	58%
	Prohibitive Regulation	33	9	27%	24	73%
	Corrupt Survival	20	8	40%	12	60%
	Resources Unaccountability	25	8	32%	17	68%
	Resources Profiteering	35	4	11%	31	89%
	Globoverfishing	29	7	24%	22	76%
	Petty Disguise	16	6	38%	10	62%
Sub-Total: Governance Loss (GL)		*268*	*79*	*29%*	*189*	*71%*
Overall Total-Unfavourable CIIs		**482**	**153**	**32%**	**329**	**68%**

Source: Author's own Table.

Thematic analysis of the data (CIIs) emerging from the CGT process (Caulfield, 2022; Chapman et al., 2015; Floersch et al., 2010) revealed variations between freshwater and marine fisheries sub-populations at the (conceptual) level of emerged themes (codes and categories) (Table 2). In overall terms, marine fisheries appear to be more unsustainable (CIIs=68%) than freshwater fisheries (CIIs=32%). This huge variance in the levels of unsustainability suggests the existence of significant quantitative differences in the type of unsustainability going on between the two sub-populations of marine and freshwater fisheries. This suggests the existence of near universal fisheries resources overfishing and profiteering (i.e., illegal and unsustainable fishing practices) happening in the marine context, but about half as much in the freshwater context. These differences could possibly be a result of freshwater fisheries resources being smaller and

thus much more convenient to monitor and safeguard than wider expanses of marine fisheries resources (United Republic of Tanzania 2016, 2020).

Trust Loss Category

Trust Loss' (TL) properties are derived from CIIs representing the lack of and/or inadequacies of trust- and credibility-enhancing mechanisms. In this regard, human undercapitalisation represents CIIs that portray the lack of credibility, trust, skills, productivity, and creativity qualities in human capital resources, hence failing to transform unsustainability problems in fisheries resources into sustainable and commercially scalable opportunities. As such, human undercapitalisation involves failures of people or actors, individually and/or collectively, to exercise creativity and innovation to sustain, scale up and develop the fisheries sector. This implies the inadequacy of innovative thinking (i.e., mindset) by actors to transform existing potentials or problematic circumstances in the fisheries sector into exploitable or realisable and scalable opportunities. As such, these human capital resources cannot be reliably trusted as capable of improving the unsustainability of fisheries resources. Technology Gap is about the abuse or misuse of advanced fishing technologies to overfish or use other forms of illegal and unsustainable fishing, hence failing a trust and credibility test in lucrative markets like the UK/EU that emphasise sustainable fishing methods. Technology gap also means limitations in fishing technology, especially by small-scale Tanzanian fishers, thus limiting their ability to access richer deep-sea fisheries resources. Traceability inadequacy means the inability of customers at various points in the supply chain, to access the seafood provenance – the information on the sustainable sourcing and quality aspect of the fisheries products, thus potentially risking the health safety of consumers. This limitation in seafood provenance lowers the potential trust and credibility that these customers would place on the suppliers of the

fisheries products. Non-cooperatised fishing is defined as the lack of collective coordination, trust, and credibility among actors in fisheries, including the weak or non-existent fishers' cooperative entities, for enhancing quality production and marketing of fisheries products. Unbanked/underbanked fishing represents a situation where actors in fisheries such as fishers are considered by suppliers of credit and other investable resources like commercial banks and insurance companies as too risky and untrustworthy to do business with, hence resulting in limited access to financial products and services including loans for their commercial scaling-up of fishing activities. Under the TL category, incidences (i.e., CIIs) of unsustainability were higher in marine fisheries (65%) than in freshwater fisheries (35%) (Table 2), but the same CIIs were present in each subgroup.

Governance Loss Category

Governance Loss (GL) is characterised by CIIs with such properties as taking advantage or exploiting institutional governance loopholes in the fisheries sector to drive and make gains from unsustainable fishing practices. GL begins with data corruption, which means the purposeful data misrepresentation to hide rogue actors' bad intentions that drive unsustainability in fisheries. This data misrepresentation leads to sub-optimal political decisions (political manipulation) and misguided policy formulations (policy confusion). These poor policies generate bad regulations that inhibit, rather than facilitate, sustainable fisheries operations (prohibitive regulation). Put together, this long chain of governance loopholes provides a window of opportunity that is exploited by rogue actors to the maximum. Included here are behaviours of unaccountability by some corrupt and irresponsible custodians and managers of fisheries resources (corrupt survival and resources unaccountability). Ultimately, this opens a way for syndicated rogue actors to prioritise their private short-term gains at the expense of long-

term public benefits through overexploitation of fisheries resources. These actions include globoverfishing (i.e., unsustainable fishing practices undertaken everywhere, especially in Tanzanian waters, by both local and foreign actors), petty disguise (i.e., disguising profitable fisheries business as small or unprofitable, hence paying lower taxes/levies), and fisheries resources profiteering (driving excessive illegal gains from fisheries overexploitation). These basic concepts do have overlaps. Indeed, there are instances when some of these concepts are combined to present illustrations more clearly about what is going on in the fisheries sector. Overall, the GL category exhibited more incidences (CIIs) of unsustainability in marine fisheries (71%) than freshwater fisheries (29%) (Table 2).

Merging Trust Loss and Governance Loss Problems into 'Fishmining' Core Category

This section presents a conceptual relationship that merges the devised problems of trust loss (TL) and governance loss (GL) into an emergent core category. Related concepts are also elaborated to show how they relate and build into each other. Further clarity of these relationships is provided via the use of flow diagrams.

The Main Concern and Emergent Core Category

The preceding sections have presented what has been going on in the fisheries sector, and this has been captured under two conceptual categories of TL and GL. Data obtained from stakeholders in Tanzania and Europe presented a mix of similar and varying CIIs on unsustainability practices in fisheries, but which both fit into these two categories of TL and GL (Figure 1). Regarding TL, the lack of trust among actors, as well as the limited credibility of fishers with key resource suppliers (e.g., banks and insurance companies) and seafood buyers or importers (e.g., UK/EU) weakened the chances of developing coordinated/collective problem-solving or conflict resolution mechanisms. This included the lack of human capital resources

with the qualities of being productive, credible, and trustworthy as well as inadequacies in traceability systems. The lack of effective traceability systems, which might have helped overcome these credibility problems, rendered the fisheries sector attractive to opportunistic rogue and exploitative actors. Under these circumstances, it was reasonably concluded that TL contributed qualitatively and/or quantitatively to cause GL. This occurred when policies, laws, regulations, and other control measures were so ineffective that rogue actors became free to mismanage and misappropriate fisheries resources by taking advantage of extant governance inadequacies and loopholes. Because these representative conceptual categories (i.e., TL and GL) are so inter-related, it was appropriate to combine them into a higher-order concept of fishmining (Figure 1), which becomes the core category. Fishmining brings together all the identified CIIs by which rogue actors exploit the fisheries resources for their short-term gains at the expense of sustainable long-term public benefits. The "fishmining" concept (Figure 1), as explained in detail below, captures the fishers' and other actors' unsustainable overexploitation of fisheries resources like the extraction of non-renewable mineral resources. This fishmining core category can be modelled into a more elaborate bottom-up conceptual mind map representation as shown in Figure 1.

How Fishmining Core Category was Derived Using CGT Approaches

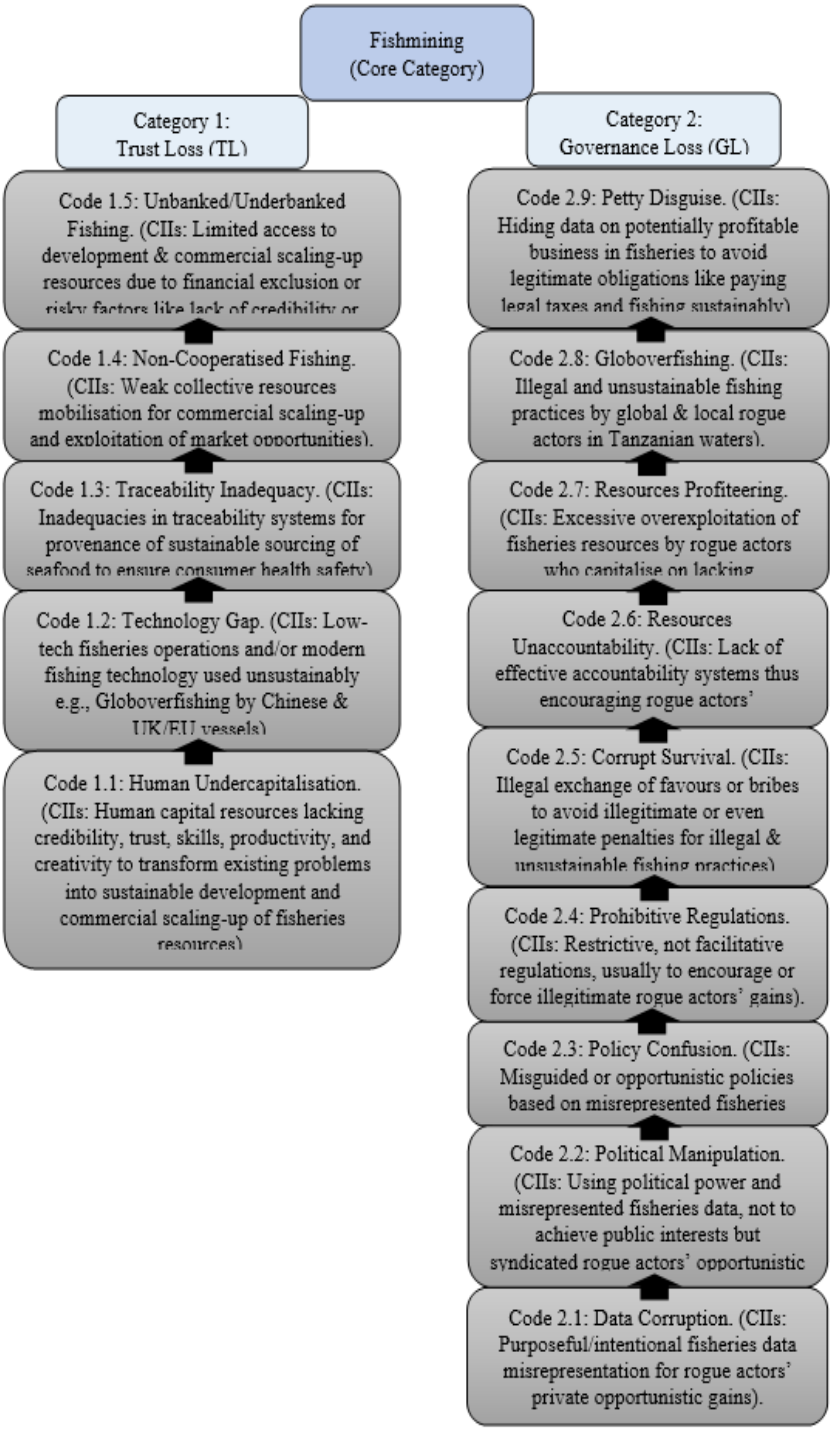
When asked the "Grand Tour Question" what the development potential of the fisheries sector was, and how they could be part of this process, fishers gave interesting views. They suggested Tanzania was losing much more value by underinvesting in fisheries than it currently gets from its minerals sector, particularly gold mining. They suggested their ongoing fishing activities were analogous to mining gold, diamonds, or Tanzanite, but where fisheries resources (e.g., in Lake Victoria and the Indian Ocean to the country's east) were considered to be much

more valuable than all the gold mines in the country. A fisher at Kunduchi landing site in Dar es Salaam said the following while flanked by fellow fishers:

> *There is one thing many people don't know; this ocean is more than a gold mine. If the government knew the wealth that lies in this vast ocean, they would have made far more money than all the gold there is in Tanzania. So, to us, this is our treasure of fish mine that's more valuable than what gold miners get in this country. You invest less money and time and make lots of returns within a day far much more easily than do gold or diamond miners. Even dynamite fishing operators take advantage of this. They blast and mine dead fish and go on to selling profitably. You can compare for yourself: we catch and sell fish every day, what about gold miners? They can go for weeks or months without even a speck of golden rock*. (Interviewee TZ87, Tanzania).

Figure 1

Bottom-up Pyramidic Fishmining Core Category/CIIs Structure



Source: Domician (2024).

Fishers' common catchphrase was: *"our treasure of fish mine"* suggesting conceptually that fishing operations and processes along fisheries supply and value chains are being run in a manner comparable to the unsustainable extraction of non-renewable mineral resources such as gold, diamonds, and Tanzanite. The unsustainable fishing practices by fishers and other actors in the fisheries supply and value chains as reported elsewhere in the current study appear to coalesce around this concept of 'fish mining.' So, *'fish mining'* represents unsustainable fishing practices by actors along the whole length of supply and value chains, extending from Tanzania to Europe (UK/EU) and to the rest of the world, by taking advantage of the absence of necessary institutional governance systems and control measures. Consistent with CGT requirements (Glaser, 1978, 1992, p.45), this *'fish mining'* term is an *in vivo* conceptualisation which is found within the fisheries substantive area lexicon.

Therefore, *'fish mining'* transcends any analytically derived conceptualisation of the researcher that might attempt to capture the same analytic concept. As such, the *'fish mining'* phrase coalesces into a single word 'fishmining' concept to coin a gerund verb (with -ing) that signifies action (Glaser, 1978). Fishmining is therefore consistent with the CGT convention of naming concepts that explain actions going on in a substantive action scene (Walsh et al., 2020, p.35). Fishmining implies the unsustainable exploitation of fishery resources as if they were non-renewable, like extracting minerals such as Tanzanite, gold, diamonds, or coal. Thus, the researcher suggests a far reaching and widely encompassing meaning of the fishmining concept: plans, actions, and/or a combination thereof by actors in the fisheries local and cross-border supply and value chains that stifle or limit the sustainable scaling-up, development and exploitation of fishery resources. These may include documented plans such as policies, laws, regulations, strategies, development programmes and frameworks. Additionally, fishmining

actions include activities implemented by rogue actors to cause the occurrence of and then exploit institutional governance loopholes. The overriding property of fishmining is its practice allows individuals and/or syndicated rogue actors to make short term gains at the expense of the wider public/society, thus privatising their illegitimate gains. As the public/society (i.e., fishers and other varied interest multistakeholders) loses long-term benefits in the process, the unsustainability actions of the rogue actors effectively render the fisheries resources unsustainable.

Using a bottom-up (pyramidic) mapping (see Figure 1), conceptual memos with similar messages/meanings (i.e., CIIs), codes, and categories constituting the fishmining core category are lined up thematically in a manner that overlaps and/or builds into each other. Despite these potential overlaps, concepts in Figure 1 have been presented in a way that suggests a bottom-up logical flow of events in the fisheries action scene. For instance, regarding the TL category, the problem begins with limitations in the supply of quality human resources who are lacking in productivity, credibility, and trust (i.e., human undercapitalisation). These people go on to abuse (i.e., unsustainable use of) advanced fishing technology (technology gap) through overfishing globally including in Tanzanian waters (globoverfishing). Also, small-scale fishers lack satellite-GPS devices on their boats to help authorities to monitor their fishing activities at sea. Furthermore, these small-scale fishers and other actors fail to invest in modernising their fishing equipment, hence the low-tech nature of fishing operations.

As fishing activities go on under these circumstances, some rogue actors undertake, and make gains from, illegal and unsustainable fishing, thanks to the lack of effective traceability mechanisms (traceability inadequacy) that would have identified, exposed, and even helped relevant authorities to prevent these illicit acts. This lack of effective traceability system lowers

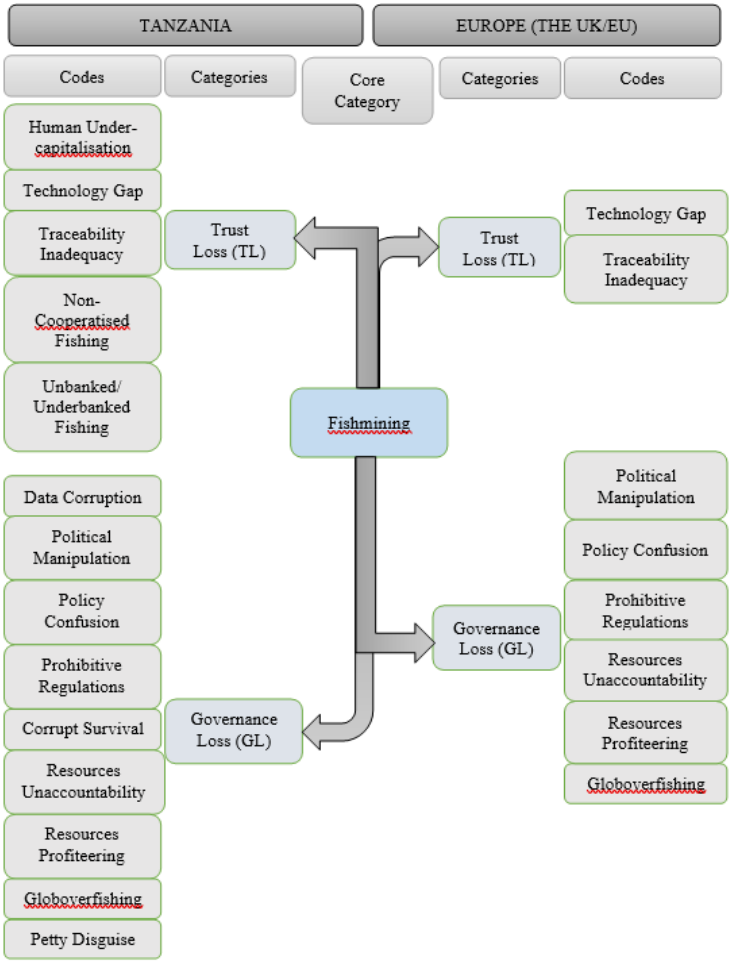
the trust and credibility of actors in Tanzania's fisheries sector with seafood buyers or importers (e.g., UK/EU) who emphasise sustainable sourcing of fisheries products to ensure consumer health safety. However, when it happens that premium price markets exist for sustainably produced fish, most Tanzanian small-scale fishers struggle to exploit this opportunity because they largely operate in such informal and low-tech settings. These fishers do not have robust collective schemes like cooperatives that would have facilitated joint capital formation/mobilisation for investment in efficient quality production and marketing of their seafood products to access local and foreign premium price markets (hence, non-cooperatised fishing). Ultimately, this lack of effective cooperative system erodes potential credibility with key credit/financial resources suppliers for sustainable development and commercial scaling-up of the fisheries sector like banks and insurance firms (hence, unbanked/underbaked fishing).

As for the GL category, data misrepresentation (i.e., data corruption) by influential actors like politicians/policy makers result in policies and regulations that contain exploitable loopholes by rogue actors who commit and gain from unsustainable fishing practices (hence, political manipulation, policy confusion, and prohibitive regulation). As a result of these poor policies, laws, and regulations, even those caught in acts of unsustainable fishing practices find it cheaper or more affordable to engage in practices of corruption and bribery that also result in fishers having to pay illegitimate exorbitant legal penalties (hence, corrupt survival). In this environment, acts of illegal and unsustainable fishing flourish as local and foreign rogue actors maximise their gains through excessive overexploitation of fisheries resources (hence resources unaccountability and resources profiteering), including through globoverfishing and the avoidance of paying legitimate taxes (i.e., petty disguise).

The flow diagramme (Figure 1) illustrates how isolated occurrences (i.e., CIIs) could come together to create patterns that eventually manifest into plans and actions of rogue actors to undertake unsustainable fishing practices. These unsustainability CIIs build-up into two higher-order concepts namely TL and GL, both of which merge into the core category of fishmining. It is important to note, however, that the CIIs used to build this fishmining core category in Figure 1 were derived from Tanzanian and European participants. In summary, as shown here and elsewhere, more incidences of unsustainability (CIIs) were recorded in Tanzania than in Europe (Figure 2).

Figure 2

Mind Map of the Fishmining Core Category and its Relation to Subordinate Categories and Conceptual Codes (Tanzania & UK/EU).



Source: Domician (2024).

The Conceptual Nature of Fishmining Core Category

This section defines the conceptual nature of the emergent fishmining core category. This includes the theoretical code (statement) about the core category's general implications in the action scene. These include relevant illustrations by local and international actors, both in Tanzania and Japan.

Fishmining as a Basic Social Process or Unit Core Category

The next question to be addressed in this CGT process is whether the fishmining core category is a basic social process (BSP). A BSP is a special core category that possesses two properties, namely: (i) processing out in two or more stages, and (ii) changing over time as observable in its stages/processes (Glaser, 1996, p.xvi; Glaser, 1978, pp. 94 and 97). It is important to establish whether the core category is a BSP or not to be able to understand the nature of the problem being investigated using the CGT technique. This knowledge is important to formulate and evaluate measures to resolve the identified problems. It was found that the fishmining core category met both BSP conditions (Figure 3). Fishmining is itself a process because, based on Glaser (1978), it has stages/processes of its own. These processes are deep/invisible fishmining, conspiracy space/uncertainty fishmining, and surface/visible fishmining. These three processes can be explained as follows: (i) *hidden planning* (deep/invisible) fishmining process, where rogue actors in fisheries plan their unsustainable fishing practices in secrecy, to hide from the public or relevant enforcement authorities; (ii) *uncertainty or unclear* (conspiracy space/uncertainty) fishmining process, whereby rogue actors act in disguise to avoid public attention if there is leakage of their plans or secrets, or to limit being monitored by relevant enforcement authorities.

To achieve these goals, the rogue actors use their influence and resources to confuse the public about what is going on, including funding, and circulating misinformation to influence, divert, or misdirect the public's opinion, for example via fake news or conspiracy theories; (iii) *Visible or clear* (surface/visible) fishmining process, whereby the unsustainable fishing practices come into the open – like overfishing (globoverfishing), dynamite fishing, poison fishing, etc. Observers may or may not realise the significance of these activities in terms of sustainability. Having discovered above that the fishmining core category is a BSP, a theoretical code statement for the emergent CGT can be derived as presented in the section following.

Theoretical Code/Statement for the Emergent Fishmining BSP CGT

Based on the preceding CGT methodological approach and analysis (Glaser, 1992; Holton, 2008; Walsh et al., 2020), a theoretical code or statement (Glaser, 1978) that predicts and explains what is going on in the fisheries sector through the emergent fishmining BSP CGT is summed up as follows:

> *Whenever trust and credibility are lacking among stakeholders, and institutional public governance is inadequate, opportunistic rogue actors will transform common fisheries resources through over-exploitation from renewable (i.e., sustainable) into non-renewable (i.e., unsustainable) resources like minerals extraction for private short-term gains.*

Given the BSP nature of the fishmining core category, it is important to elaborate and illustrate in a more practical way the processes of the emergent fishmining BSP CGT. This is undertaken in the section following.

Illustrating the Fishmining BSP CGT Processes

To demonstrate how the fishmining BSP CGT processes operate, we consider two illustrations from Japan and Tanzania. Starting with Japan, the country had a hidden plan to meet its food security needs through unsustainable whale hunting. However, when suspicion grew about the scale of their unsustainable whaling for food activities, Japan disguised it (i.e., created uncertainty) as a scientific research programme (Raihani & Clutton-Brock, 2009). Under the cover of this disguise, Japan continued its unsustainable whaling activities (i.e., visible unsustainability occurrences). Regarding the Tanzanian illustration, the government's team against illegal fishing practices was surprised in 2019 to find out that despite tips from local Beach Management Unit (BMU) members, surveillance missions went without catching any rogue fishers/actors at sea. An investigation found later that some marine police officers in the team colluded with fisher groups by sharing hidden/confidential surveillance plans while faking/disguising their identities as reliable/trustworthy members. These hidden/disguised actions helped the rogue fishers to visibly undertake unsustainable fishing practices outside the planned surveillance scheduled times. It was highly probable that the rogue fishers would have been sharing the profits of the unsustainable fishing practices with these untrustworthy marine police officers.

Similarly, further reports on fisheries resources monitoring in Tanzania revealed that some rogue actors applied the above same tricks to bypass authorities procedures and illegally smuggle fish products across the international borders into neighbouring Zambia and the Democratic Republic of the Congo (DRC). Also reported are incidences of foreign rogue actors (largely of Chinese and European origins), undertaking illegal and unsustainable fishing in Tanzanian waters.

Transforming Fishmining BSP CGT into Formal Grounded Theory

Presented here is a basis in literature that could directly advance the implications of a BSP core category into a formal grounded theory (FGT). This rare practice in grounded theory development is applied to transform fishmining BSP core category into a FGT. The key proponents of this approach are Glaser (1978) and Glaser & Holton (2005).

Relevant Literature: How to Advance Fishmining BSP CGT into FGT

There are two types of core categories from which FGTs can be developed: (i) unit core categories (i.e., non-BSPs), and (ii) BSPs. Many FGTs have thus far been derived from non-BSPs core categories (e.g., Glaser & Strauss, 1971; Astrom, 2006). Generation of FGTs from unit (i.e., non-BSPs) core categories requires analysts to generalise the implications of substantive core categories by undertaking constant comparative analysis in many other empirically different yet conceptually/theoretically similar substantive areas or contexts (Glaser & Strauss, 1967; Glaser, 1978; Glaser & Holton, 2005; Astrom, 2006; Andrews, 2007; Nathaniel, 2007; Glaser, 2010). However, Glaser (1978, p.97) and Glaser and Holton (2005, p.69) offer some clues on potentially advancing FGTs directly from BSPs core categories - an approach that has so far been scantly explored by GT researchers/analysts. Given little or no empirical work thus far in terms of relevant literature, this study attempts to follow Glaser's (1978) and Glaser and Holton's (2005) tips with the view of transforming the fishmining BSP CGT into a FGT.

BSPs core categories can directly transform into FGTs because their scope, processes (and sub-processes), and social implications are such complex and extensively grabbing that they transcend multiple substantive areas and contexts over time (Glaser, 1978; Glaser & Holton, 2005). Glaser (1978, p.97) argues that one of the key properties of a BSP is to have far-reaching general implications beyond one substantive study or context. Glaser (1978) and Glaser and

Holton (2005) state further that BSPs, like the emergent fishmining BSP CGT, are usually rendered as formal grounded theories (FGTs) without necessarily having to undergo a further formal theory development process that captures similar problematic incidents (i.e., CIIs) across multiple substantive areas/contexts. To quote Glaser (1978, p.97) and Glaser and Holton (2005, p.69) :

> *...BSPs are ideally suited to generation by grounded theory from qualitative research which can pick up process by fieldwork continuing over time. BSPs are a delight to discover and formulate since they give so much movement and scope to the analyst's perception of the data. BSPs such as cultivating, defaulting, centring, highlighting, or becoming, give the feeling of process, change and movement over time. They also have clear, amazing general implications; so much so, that it is hard to contain them within the confines of a single substantive study. The tendency is to refer to them as a formal theory without the quite necessary comparative development of formal theory. They are labelled by a 'gerund' ('ing') which both stimulates their generation and the tendency to over-generalise them.*

Although BSPs are developed within structural organisational units (e.g., fisheries sector or actors), they tend to be abstract of these units such that these BSPs can be modified to respond to variations in multiple substantive contexts across time, people, and places (Glaser & Holton, 2005). As such, BSPs represent theoretical statements about processes occurring within and beyond the structural organisational units (e.g., fisheries contexts) from where data were collected and analysed. By these features/properties, Glaser and Holton (2005) argue BSPs could directly transform into FGTs in a manner similar to procedural steps of constant

comparative analysis on the implications of a unit/non-BSP core category in other empirically different but conceptually related substantive areas would generate a FGT.

To illustrate Fishmining BSP CGT's potential properties as a FGT, its general implications of unsustainability (i.e*., weak social interactions between and among people and institutions result in poor governance and mismanagement of resources*) appear to transcend the fisheries structural unit actors and operations. Unsustainability, including the mismanagement of public and other human and non-human resources, is a widespread global phenomenon across several substantive areas/contexts, geography/places, time, and people. An example of this phenomenon is a recent United Nations report on Sustainable Development Goals (United Nations, 2025) which states, among other things, that millions of people in many countries around the world continue to face poverty, hunger, inadequate housing, and limited or no access to basic services including water, education, and healthcare. It reports further that the most disadvantaged members of society are women, children, and people with disabilities. The report concludes that these unsustainability problems are worsened by ongoing armed conflicts, climate change challenges, growing social inequalities, illicit cross-border business transactions (financial flows, mineral resources, drug cartels, etc.), and rising international debt-servicing costs among the developing world countries.

Fishmining BSP GT Processes and Sub-Processes

Each of the three Fishmining BSP processes highlighted earlier traverses sub-processes (Figure 3). These sub-processes are: (i) the jurisdiction (local-regional-global) operational sub-process; (ii) the legal/regulatory sub-process; and (iii) management (planning, execution, and control) sub-process. According to Glaser (1978), each of these processes has got its specific or unique features/properties called dimensions or characteristics. For instance, one of the

characteristics of the process of deep/invisible fishmining is rogue actors committing unobserved unsustainable fishing practices. However, these actors do this across time and geographical/jurisdictional borders (hence the local-regional-global jurisdictional sub-process). This is done by manipulating and exploiting loopholes in existing local and cross border legal and regulatory regimes and misrepresenting data to remain unobserved (hence the legal/regulatory sub-process). This invisibility occurs mostly at the planning stage of the fishmining activities by fishminers (i.e., rogue actors); but it also encompasses the creation of disguises through precoordinated acts of planning, execution, and control/evaluation (hence the management sub-process).

The Deep/Invisible (Hidden Planning) Fishmining BSP CGT process

This process has three sub-processes. *Management sub-process* involves hidden planning, execution, and control (i.e., evaluation) of unsustainable fishing practices. Examples include Japan's hidden whaling plans and Tanzania marine police's secret involvement in unsustainable fishing practices. *Regulatory sub-process* occurs when rogue actors secretly plan to establish loopholes in existing and new laws and regulations that would offer them opportunities to undertake unnoticed illegal and unsustainable fishing activities as exemplified by marine police in this study. *Jurisdictional sub-process* occurs when there is a hidden or secret cross-border undertakings of illegal and unsustainable fishing practices involve actors across geographical boundaries, such as the hidden acts of globoverfishing involving teams of Tanzania, Zambian, DRC, and even Chinese and European rogue actors.

The Conspiracy Space/Uncertainty Fishmining BSP CGT process

The main characteristic of this process is uncertainty or disguise about what is going on whereby observers may not be able to see, discover, or understand with certainty these disguised

plans or actions. It also has three sub-processes. In management sub-process, rogue actors operate in a disguised way to avoid attracting public/observer attention. For instance, the Japanese disguised their whaling activities as part of scientific research, when it was in fact an undertaking to meet their food security needs. Regulatory sub-process occurs when rogue actors appear to be enforcing laws and regulations against unsustainable fishing practices while actually doing the opposite for personal gain. A good example here is that of Tanzania marine police officers explained earlier. Jurisdictional sub-process happens when local and foreign rogue actors collaborate to exploit governance loopholes across borders/jurisdictions to undertake and gain from unsustainable fishing while disguising their actions as legal or sustainable. For instance, some foreign fishing vessels obtain permits to operate in Tanzanian waters. However, they intentionally sabotage GPS locating devices to avoid real time monitoring at sea by authorities and disguise these actions as natural device failures. In fact, they do this to cover up their illegal and unsustainable fishing practices.

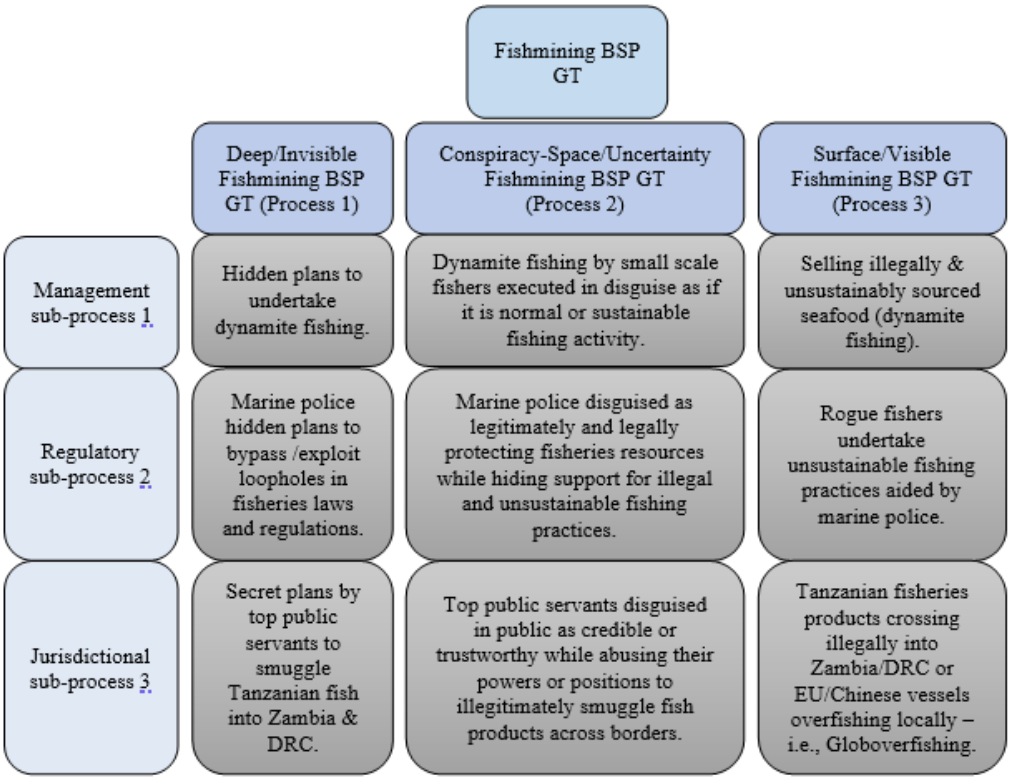
The Surface/Visible Fishmining BSP CGT process

This illustrates the visible consequences of the actions of unsustainability in fisheries undertaken by the rogue actors undertaken in three sub-processes. Management sub-process involves the planning and execution of visible acts of unsustainable fishing practices. These include visible acts of unsustainable fishing namely globoverfishing by European and Chinese fishing vessels in Tanzanian waters and dynamite fishing by local small-scale fishers. Regulatory sub-process occurs when existing laws and regulations contain visible loopholes that are exploited by rogue actors to undertake and gain from illegal and unsustainable fishing practices. Examples of this have been presented earlier in this study and in Figure 3 involving marine police officers as well as smuggled fish cagoes illegally crossing Tanzanian border into Zambia

and DRC. Jurisdictional sub-process is when local and foreign rogue actors collaborate in unsustainable fishing practices to maximise their illegitimate gains.

Figure 3

Bottom-up (Pyramidic) Fishmining BSP GT's Three Main Processes & Sub-processes



Source: Domician (2024).

The preceding processes and sub-processes (Figure 3) add to the complex nature of fishmining BSP GT as it proves fit, relevance, workability, and modifiability across time, variable places (i.e., geographical borders/jurisdictions, management, and regulatory regimes), and people in these multiple contexts. This multi-dimensionality in varied substantive areas and contexts demonstrates fishmining BSP CGT's practical application beyond its original structural unit of analysis (i.e., fisheries), hence earning it another argument to become a FGT as suggested in Glaser (1978) and Glaser and Holton (2005).

Discussion

This study found that the lack of collaborative trust and credibility among multi-stakeholders weakened the collective governance effort, hence driving unsustainability practices over fisheries resources. This happened when local and foreign rogue actors took advantage of the situation to overexploit the fisheries resources, thus making private gains at the expense of the general public. These failures were summed up in the fishmining BSP CGT whereby the lack of trust between and among people and institutions result in poor governance and mismanagement of fisheries resources. However, following the approaches proposed in Glaser (1978, p.97) and Glaser and Holton (2005, p.69), this fishmining BSP CGT was successfully and directly transformed into a FGT. This happened because fishmining BSP CGT's general unsustainability implications appeared to transcend fisheries into other human, non-human, and other resources and/or structural units. Despite the scanty literature on direct empirical advancement of BSPs into FGTs, fishmining BSP FGT's general transceding implications appear to align with other BSPs that meet the FGT development requirements: cultivating, defaulting, centring, highlighting, and becoming which give the feeling of process, change and movement over time while traversing multiple structural units (i.e., substantive areas or contexts) (Glaser, 1978, p.97; Glaser & Holton, 2005, p.69).

While fishmining BSP FGT was directly developed from a BSP core category, other FGTs have been advanced from unit/non-BSP core categories like *Status Passage* (Glaser & Strauss, 1971*), Moral Positioning: A formal theory* (Astrom, 2006), and *Organisational Careers: A forward theory* (Glaser, 2010). Also, whereas fishmining BSP FGT was developed using an inductive approach, some other researchers have developed GTs both inductively and sometimes

combining inductive and deductive approaches. For instance, Lasner and Hamm (2014) employed both inductive and deductive approaches to generate the grounded theory (GT) of ecopreneurship. This theory suggests that fish farmers' decisions on adopting ecological/sustainable innovations follow a balanced risk and return management approach involving economic cost-benefit (profitability) analysis, ecological/sustainability motives, and relevant social aspects (Lasner & Hamm, 2014). On the other hand, this study's findings resemble those of Georgakopoulos et al. (2008) who generated a GT of Organic Fish Farming through an assessment of the degree of stewardship required to conserve fisheries resources and associated marine ecological damage risk levels among fish farmers in Scotland. Georgakopoulos et al. (2008) had assumed that granting fish farmers exclusive property ownership rights of fisheries resources would incentivise them to sustainably conserve resources (i.e., stewardship), thus lowering the risk of marine environmental mismanagement and overexploitation. This assumption was due to the fact that property rights provide guaranteed/predictable long-term returns (i.e., intergenerational sustainability) (Perman et al., 1999). However, the GT of Organic Fish Farming explains that the fish farmers' risk and return strategies do not necessarily support the view that property rights incentivise the stewardship of the marine environment (Georgakopoulos et al., 2008; Hotelling, 1931). Finally, this study's fishmining BSP FGT appears to coincide with Patten (2006) that produced a GT of Law Enforcement Officers' Receptivity Towards Collaborative Problem Solving in fisheries and wildlife resources in the US. This GT explained and predicted that unsustainable overexploitation and mismanagement of fisheries and other wildlife resources were largely a result of regulators' limited willingness to accept and adopt collaborative sustainability measures involving fishers and other resource users (Patten, 2006).

Evaluation of Emerging Fishmining BSP FGT

Based on Glaser and Strauss (1967), a GT has to meet both theoretical and practical evaluation criteria. The emerging fishmining BSP FGT meets all theoretical development requirements of undertaking a GT study as illustrated in this study. On the practical side, the fishmining BSP FGT fits and is thus relevant to the ongoing unsustainability challenges in fisheries and other general multiple resource-based contexts. It also works by being able to explain and predict behavioural occurrences of unsustainability in fisheries and other varied resource-based substantive areas. Finally, the fishmining BSP FGT's Tanzanian-European scope makes it modifiable to new situations subject to changes in data or contexts across time, people, and places.

Conclusion

This study generated fishmining BSP FGT that explains how actors solve and resolve unsustainability problems in fisheries and other general multiple resource-based settings. To guide resource-based policies for solving and resolving unsustainability challenges, relevant authorities need to adopt bottom-up approaches to building trust among all stakeholders, thus enhancing collective/collaborative sustainable governance of fisheries and other human and non-human resources both locally and globally. Finally, future research should focus on generally refining methodology and empirically setting up procedural steps of advancing BSPs into fully fledged FGTs by extending the works of Glaser (1978, p.97) and Glaser and Holton (2005, p.69).

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