Reconciling wellbeing and resilience for sustainable development

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29 **Preface**

30 Securing wellbeing and building resilience in response to shocks are often viewed as
31 key goals of sustainable development. Here, we present an overview of the latest
32 published evidence as well as the consensus of a diverse group of scientists and
33 practitioners, drawn from a structured analytical review and deliberative workshop
34 process[1]. We argue that resilience and wellbeing are related in complex ways, but in in
35 their applications in practice they are often assumed to be synergistic. Although
36 theoretically compatible, evidence we present here shows they may in fact work against
37 each other. This has important implications for policy.

38 **Main**

39 As society grapples with the associated challenges of global development and
40 environmental change, securing individual and collective wellbeing and building social-
41 ecological resilience are key global and national policy targets. We suggest that narrow
42 interpretations of resilience or wellbeing are not necessarily positively related. Trade-
43 offs between wellbeing and resilience can reduce the chances of meeting policy targets
44 for either, for example in those set under the United Nations' Sustainable Development
45 Goals (SDGs). This article characterises the narratives that lead development agencies
46 to pursue resilience and wellbeing simultaneously. It gives examples where this strategy
47 has created trade-offs that undermine either resilience or wellbeing, and suggests that
48 adopting broad, holistic interpretations of resilience and wellbeing, whilst acknowledging
49 temporal and spatial scales can help avoid three trade-offs so that policies and
50 interventions can successfully promote both.

51 **Resilience and wellbeing as process and outcome**

52

53 Wellbeing and resilience approaches have evolved considerably since they were
54 introduced, and they have both gained prominence in development policy and practice.
55 Wellbeing is seen as an alternative, more meaningful, measure of social progress, in
56 the face of growing criticism of economic measures[2], while resilience is promoted as an
57 essential aspect of development in an uncertain world of disturbance and surprise.

58   However, in their application, they often remain ambiguous, and it is not clear which
59   conceptions of wellbeing or resilience are used by different organisations, or different
60   conceptions are conflated when implemented, as in the case of social and individualistic
61   notions of wellbeing [3].

62

63   **Wellbeing** is increasingly understood as a multi-dimensional concept that consists of
64   objective measures (of what people have achieved or are able to achieve) and
65   subjective measures (how they evaluate their situation [4]). Some frameworks also give
66   attention to a relational dimension, acknowledging that wellbeing outcomes are largely
67   produced through relationships, between people and with their social, economic and
68   environmental contexts [5]. As such, a wellbeing approach does not assume limitless
69   growth or progress, but instead looks at the ways in which people construct wellbeing in
70   resource-constrained environments. **Resilience** is also multi-dimensional and has often
71   been defined as the capacity of a system to withstand perturbations whilst maintaining
72   its structure and functions [6]. Whilst contemporary definitions increasingly encompass
73   the capacity to adapt to and transform in response to change[7], applications of resilience
74   for sustainable development often emphasise buffering, coping and seek to maintain
75   stability of status quo[8]. Drawing on insights from complex social-ecological systems
76   theory, the resilience approach provides a way of understanding change as non-linear
77   and spanning spatial and temporal scales[7]. Resilience approaches are called for in
78   numerous policy fora and are central to some, such as the Paris Agreement of the
79   United Nations Framework Convention on Climate Change.

80

81   Both of these concepts are multi-dimensional and are increasingly understood as being
82   dynamic and socially contingent [7]. One cannot simply acquire resilience or wellbeing
83   and hang on to them like an asset or money in the bank. Therefore, resilience or
84   wellbeing can be seen as both process and outcome [9]. Accounting for context-specific
85   needs, values and circumstances in their practical applications is crucial for ensuring
86   that wellbeing and resilience processes and outcomes are socially just, equitable and
87   sustainable. This warrants an improved integration of objective and subjective
88   measurements of wellbeing and resilience indicators. So called analytic-deliberative

89   processes are increasingly used to integrate such different types and sources of
90   relevant information, bringing together scientific knowledge and objectively observable
91   conditions with more subjective, context-specific knowledge, values and lived
92   experiences [10].

93

94   This ensuing discussion extends long established debate about poverty-environment
95   conflicts, bringing more systemic and interdisciplinary analysis and understanding. By
96   emphasising dynamic, causal relationships rather than outcomes per se, it exposes and
97   probes some of the hidden trade-offs, inconsistencies and assumptions in the pervasive
98   and persuasive discourses surrounding wellbeing and resilience that potentially
99   undermine the achievement of global sustainability goals.

100

101 **An idealised relationship between resilience and wellbeing**

102

103 The pursuit of wellbeing and resilience is also prevalent throughout the SDGs and made
104 explicit in seven of the goals (Table 1). These two concepts are expressed in goals and
105 targets, and as means to achieve them. In some instances, goals related to wellbeing,
106 such as no poverty, no hunger and good health (which are all considered essential
107 domains of wellbeing[11]) have targets that explicitly mention resilience. This creates a
108 narrative of greater resilience leading to greater wellbeing. Conversely, some
109 environmental resilience related goals which aim to protect species, habitats, prevent
110 irreversible regime shifts and sustain the prevision of ecosystem services [12] have
111 wellbeing targets such as improving education or supporting a diversity of nature-related
112 values[13,14]. This forms a narrative that greater wellbeing sustains greater resilience.

113

114 Table 1: Operationalised relationships between resilience and wellbeing amongst the
115 sustainable development goals.

Goal	Target	Idealised Relationship
1-No poverty	1.5 Build Resilience of poor and reduce their exposure to shocks	
2 – Zero hunger	2.4 Implement resilient agricultural practices	Greater resilience

		sustains greater wellbeing
3 – Good health and well-being	3.D Strengthen capacity for early warning, risk reduction and management of national and global health risks	
11 – Sustainable cities and communities	11.7 Provide access to green spaces	Greater wellbeing sustains greater resilience
13 – Climate action	13.3 Improve education	
14 – Life below water	14.7 Increase economic benefits to least developed countries through use of marine resources 14.D Provide small scale fishers access to markets and marine resources	
15 – Life on land	15.9 Integrate peoples' ecosystem and biodiversity values into poverty reduction strategies	

116

117 These two concepts are also thought of as mutually beneficial amongst some of the
118 most influential non-government organisations (NGOs) focused on conservation,
119 sustainability and or development. Oxfam, for example, define resilience as 'the ability
120 of women and men to realize their rights and improve their well-being despite shocks,
121 stresses and uncertainty' [15]. Practical Action, a development NGO, also define
122 resilience as "the ability of a system, community, or society to pursue its social,
123 ecological, and economic development and growth objectives, while managing its
124 disaster risk over time in a mutually reinforcing way"[16]. Similarly, Conservation
125 International projects that seek to restore degraded land aim to directly improve the
126 wellbeing of communities through enhancing ecological resilience[17]. Other organisations
127 such as the International Fund for Agricultural Development argue that "poor rural
128 people are less resilient" and that building the personal resilience of rural people can be
129 done in part through increasing their incomes and assets, asserting that economic
130 security can be a source of resilience[18]. World Vision, a humanitarian and development
131 organisation, have taken learning from the concept of resilience right into the heart of
132 their programs. They developed a theory of change that incorporates notions of
133 household and community resilience with child wellbeing outcomes[19]. As such, it

134 appears that resilience to climate change or extreme events, be it either at the system
135 or individual level is often measured through social, economic, community or social
136 capital variables. Although the range of interpretation and degree of embedding
137 resilience and wellbeing into their operations ranges dramatically, these concepts have
138 been internalised by many organisations seeking to improve the lives of communities.

139

140 The academic literatures on social-ecological resilience and wellbeing also point to a
141 close correspondence between these two concepts. The social-ecological resilience
142 literature aims for an integrated systems-based view of how human society is linked
143 with ecosystem change, and how change occurs within that linked system [20]. This in
144 turn has provided insights on the role of social-ecological systems for wellbeing, poverty
145 alleviation and development [21–23]. Of note, the concept of social-ecological traps offers a
146 dynamic explanation of social-ecological processes that trap people in multi-
147 dimensional poverty. Cinner's study, on tropical reef fisheries, for example, where
148 poverty is high and local institutions weak, found that overfishing with destructive gear
149 can push coral reef social-ecological systems past key thresholds by reducing coral
150 cover and herbivorous fish. Ecological feedbacks then led to the proliferation of
151 macroalgae, thus locking the system into an undesirable state where overfishing results
152 in poor yields and reef systems are further degraded [24]. Such such thinking enables
153 resilience scholars to explore tangible pathways for disrupting social-ecological traps [25]
154 with particular focus the role of adaptation and transformation for escaping from traps
155 [7,24]. Thus, resilience science helps us to understand what keeps people in different
156 forms of poverty as well as what will lead to improvements to their wellbeing [26]. Broadly
157 defined as the ability to successfully deal with change, resilience levels can also help in
158 identifying who will do better or worse in the face of environmental change and shocks.
159 Further, resilience is defined in terms of wellbeing, for example as the capacity of a
160 person, household or other aggregate unit to avoid poverty over time in the face of
161 various stressors and shocks[27]. With such a 'resilience sustains wellbeing' narrative,
162 resilience is the intermediate target and it is assumed to have positive effects on
163 wellbeing (Fig.1a).

164

165 Conversely, recent literature on wellbeing suggests that the material, relational, and
166 subjective domains of wellbeing influence human resilience and the ability to adapt and
167 cope in the face of stressors and shocks[21] . Material wellbeing refers to what people
168 have and includes resources such as foods, income and assets, amongst others [28].
169 These confer resilience by providing resources that people can draw on to adapt to
170 stressors and shocks [29,30]. In the face of dwindling fish stocks, for example, coastal
171 societies or individuals can draw on financial assets to purchase bigger boats or new
172 fishing gear in order to fish further afield or target different species[31]. Relational
173 wellbeing refers to what people do and how they interact with others to meet their needs
174 and achieve a good quality of life [28]. Here again, it is argued that relationships between
175 individuals, communities and organisations can help build resilience to change by
176 providing social support and access to knowledge and resources [32]. Preparing for or
177 recovering from high-intensity storms, for example, will often require individuals to help
178 one another and for state agencies to coordinate short-term recovery [33]. Subjective
179 wellbeing refers to how people think and feel about their situation [28]. This is also
180 deemed to be important for responding to environmental change as people have little
181 incentive to act unless they believe that their actions can produce desired outcomes or
182 forestall undesired ones [25]. The above suggests that all dimensions of wellbeing can be
183 seen as sources of resilience, for they influence the potential for adaptation and in turn
184 the potential for improved wellbeing through adaptation [29]. This supports a 'wellbeing
185 sustains resilience' narrative (Fig.1b).
186
187 >Insert Figure 1<
188

189 **Where pursuit of one may undermine the other**
190 These two discourses, that wellbeing promotes resilience and that resilience promotes
191 wellbeing, imply positive synergy between the two. However, the literature is replete
192 with examples from different contexts and scales of social organisation, be they at the
193 individual, community or aggregated at a regional level, where the pursuit with a focus
194 on either one has undermined the other. Thus, while we recognize that the pursuit of
195 wellbeing and resilience is necessary to meet global sustainability challenges, we call

196   attention to the critical need to go beyond tacit assumptions about their relationship to

197   carefully consider when one does indeed sustain the other. Three examples are given

198   below, one stemming from feudal society which illustrates the complexity of this

199   relationship and two from contemporary reports by practitioners which demonstrate how

200   unintended trade-offs can occur between resilience and wellbeing in development

201   practice.

202

203   A historical perspective can shed light on the tensions between resilience and wellbeing

204   of peasants in feudal societies. In these societies, the well-off landowners would provide

205   loans or reduce the taxes of those who laboured their land, when there were poor

206   harvests or the households were going through a tough period. They allowed collection

207   of crop residues from their land for fuel and fodder and helped in educating the children

208   of the peasants[34–36]. Such systems reinforce highly unequal distribution of resources

209   and wellbeing and further the interests of patrons as they ensure the continuation of the

210   community as a whole and ensure support that maintains privileged positions in

211   society[36]. In such situations, any surplus from ecosystem services, in this case

212   agricultural production, that labourers might accumulate in order to lift themselves out of

213   poverty is usually appropriated by higher classes through obligations and uneven

214   property rights[36]. As such, the peasants in this case would not take risks. They foster

215   the relationship with their overlords to maintain their resilience in terms of their ability to

216   survive crises, with the effect of limiting their wellbeing. These social relationships were

217   a major constraint on capital accumulation and hence constituted poverty traps, thus

218   undermining the pursuit of wellbeing for the labourers. The important trade-off to draw

219   attention to is that the clients are willing to sacrifice surplus of harvest for the security of

220   not starving in the hungry season or times of crisis [34]. These patron-client relationships

221   provide the only means of access to credit for the poor and provide loans that match the

222   unpredictable nature of ecosystem service provision[37]. However, the price for flexibility

223   and security are exploitative conditions of transaction that mean that the benefits of

224   ecosystem services accrue very largely to the 'patron'[38]. This exemplifies the types of

225   trade-offs that can occur between resilience of the peasant and their wellbeing. It will be

226   wise to review more deeply whether and when promoting resilience or wellbeing

227 objectives can be expected to improve the other in pursuing the sustainable
228 development goals.

229

230 Other examples come from organisations that after attempting to build social-ecological
231 resilience or enhance wellbeing of communities note that these are not always mutually
232 beneficial and the pursuit of one can undermine the other. Médecins Sans Frontieres
233 (Doctors Without Borders) for example, have recently stated that 'building resilience' is
234 often at odds with a core humanitarian approach to crises which seek to enhance
235 wellbeing[39]. They argue that when a response becomes a mixture of 'all things to
236 everybody' (building capacity, reducing vulnerability and ensuring sustainability), often
237 the basics are overlooked. There is a danger that 'building resilience' becomes an
238 excuse for inaction on the basics of saving lives and alleviating suffering[39]. This
239 suggests that a focus on resilience can sometimes ignore direct and necessary
240 wellbeing impacts from sustainable development interventions. Conversely,
241 Greenpeace have argued similarly that projects focused on increasing food production
242 and achieving wider wellbeing goals have left farmers less resilient due to dependence
243 on external inputs and resources that are too costly or unsustainable for farmers [40].
244 They highlight that certain approaches that sought to enhance wellbeing had created
245 dependence on costly external inputs which led to soil degradation by imbalanced use
246 of nutrients and that they at times relied on utilising resources that were unsustainable
247 such as use of drinking water for irrigation or expanding rice cultivation and irrigation
248 plans in water-limited locations [40]. How can we identify holistic approaches that combine
249 both features that are so vital for sustainability? We argue that a better understanding of
250 potential trade-offs can help to reach synergies amongst these concepts in practice.

251

252 The above examples illustrate that the *casual* use of the narrative of resilience and
253 wellbeing being *causally* synergistic can lead to unintended environmental or social
254 consequences. So much so, some agencies have become disheartened as they have
255 experienced trade-offs between resilience and wellbeing when pursuing sustainable
256 development goals[39]. This can have important ramifications if organisations re-focus
257 their attention and specialise on approaches that build resilience or wellbeing in

258   isolation. We argue that it is important to be aware of trade-offs between these two
259   goals, but that there should be renewed focus on how they can inform each other
260   positively. The question is then, how to realign resilience strategies to work with rather
261   than against wellbeing pursuits and vice versa. Before doing so however it is important
262   to understand the origins of these trade-offs.

263

264   **The roots of trade-offs between resilience and wellbeing**

265

266   Despite the complex multi-dimensional natures of wellbeing and resilience, indicators
267   are commonly employed which are simplistic and narrowly-focussed around qualities
268   that are easy to measure such as income or resistance to specific shocks [21]. Decision-
269   makers are led to focus only on those elements that are captured by the indicators and
270   not aspects that are less amenable to quantification, such as power, relational values,
271   culture, slow onset crises or increasing hazards. These narrow interpretations of
272   wellbeing or resilience are often at the root of the trade-offs that are seen to exist
273   between them. For example, efforts to enhance material wellbeing (income) through
274   conservation interventions (biodiversity conservation) which seek to prevent irreversible
275   ecological regime shifts**,** can worsen inequalities and damage the moral fabric of
276   communities by undermining peoples' perception of fairness. This in turn, can weaken
277   their motivation to support such interventions and undermine the resilience of the
278   system [41,42]. The more intangible relational values, power and culture vitally affect how
279   and whether trade-offs manifest and who is most impacted by them.

280

281   Narrowly conceptualised interventions to support resilience can often be limited to the
282   ability to withstand or resist specific stressors and shocks (specific resilience) rather
283   than to build an "all-purpose kind" of general resilience [23]. Critically, resilience theory
284   has shown trade-offs between specific and general resilience[23]. Also, resilience is about
285   more than resistance to disturbance, it is equally about the opportunities that
286   disturbance opens up through adaptation, learning and self-organisation to do things
287   differently [20]. As a result, interventions to support resistance to specific shocks may
288   have unanticipated negative impacts on wellbeing. The negative impacts that can arise

289   from when adapting to specific shocks and stressors have been discussed extensively
290   in the maladaptation literature [43] however we argue that an understanding of the
291   complex relationship between wellbeing and resilience can help understand them. For
292   example, following the Asian tsunami in 2004, new legislation in India and Sri Lanka
293   forbade homes and businesses being rebuilt close to the coast in order to create buffer
294   zones and build resilience to future tsunamis[44]. Whilst this reduced exposure to future
295   tsunamis, the re-housing of coastal people, dependent on the sea, to isolated inland
296   villages disrupted livelihoods and cultural and social attachments to the ocean,
297   undermining wellbeing in diverse ways. As such this intervention to enhance resilience
298   to such shocks led to a short term gain yet long term risk to the wellbeing of those
299   displaced. It also highlights that such responses to shocks and stressors are reflective
300   of the political context and power dynamics at play. This opened up the remaining
301   coastal strip for more powerful large-scale tourism development interests and impeded
302   rehoused people's access to fisheries. There was a lack of consideration of what is
303   important for these communities' wellbeing and their resilience to other shocks and
304   stresses such as ill health. Whilst members of these communities might have survived
305   the disaster physically unhurt, the resilience intervention had put their property and
306   livelihood in jeopardy[44]. Pushing a resilience strategy that works against peoples' own
307   priorities is unlikely to work. The re-developed safer settlements inland in Sri Lanka
308   were only occupied by woman and children, whilst male fishers continued to reside and
309   work by the sea therefore countering potential resilience benefits for men [45]. In
310   summary, the focus on responding to a single stressor and shock, the tsunami, in India
311   and Sri Lanka has ignored the erosion of social and economic capital of relocated
312   communities. Thus, attempts to improve resilience to a specific threat reduced wellbeing
313   while also reducing 'general resilience'.

314

315   Efforts to improve wellbeing interpreted in a narrow or single dimensional sense can
316   also undermine social-ecological resilience. A focus on income generation to improve
317   wellbeing, for example, led to the rapid expansion and specialisation of shrimp farming
318   in Asia. In Bangladesh, a large number of farmers converted their rice fields to export-
319   oriented prawn farms. All prawn farmers, irrespective of size of their prawn farms, have

320 made profits and now associate this change with increases in income [38]. Shrimp farming
321 has also encroached on agricultural land, resulted in mangrove clearance and caused
322 serious degradation of land and de-stabilization of coastal ecosystems[38]. This large-
323 scale conversion of agricultural land to shrimp ponds has in many cases led to a paucity
324 of vegetables, impacting food security and nutrition. Further, these impacts are set to
325 persist given that the salinization caused by the ponds will likely undermine or even
326 prevent agriculture in the future undermining the social-ecological resilience of the
327 region.

328

329 More generally, the progression from low to high standards of living is normally thought
330 to involve people specialising in products that correspond to their competitive advantage
331 [46]. This economic argument has underpinned developments in agriculture (e.g., the
332 promotion of cash crops and monocultures) as well as in aquaculture. In Central Asia
333 during the Soviet era, intensive monoculture production was seen as economically
334 beneficial. However, the removal of traditional resource management practices
335 exacerbated water stress in the region leading to a legacy of environmental degradation
336 [47]. It is increasingly understood that whilst there may be short-term material benefits to
337 specialisation, the adverse environmental consequences can increase vulnerability to
338 climate variability and change [25,48,49]. Further, specialisation is argued to limit
339 households' flexibility and consequent adaptive capacity to deal with stressors and
340 shocks [50]. A focus only on improvements to specific aspects of wellbeing can undermine
341 the longer-term ability to maintain social and ecological diversity, threatening the long-
342 term resilience of social-ecological systems.

343

344 **Paving the way to synergies**

345

346 Although wellbeing and resilience approaches are rooted in distinct disciplinary
347 traditions, both concepts have evolved considerably since they were introduced in ways
348 that they can now inform one another. More holistic interpretations of wellbeing and
349 resilience are often considered to be intrinsically linked. Over time, for example, an
350 individual's wellbeing depends on personal resilience and mental toughness, as well as

351 resilience of the social-ecological system which the individual is part of [51]. Similarly,
352 resilience to environmental change requires people to have material assets, social
353 connections and a capacity to act collectively with others. They also need sufficient
354 agency in their adaptive responses[31], all of which are closely linked to domains of
355 wellbeing[52,53].

356

357 Despite the theoretical complementarities that are shared between wellbeing and
358 resilience, we have seen that in practice this relationship is not always synergistic and
359 that the narrow pursuit of one, can undermine the other. Given the policy imperative and
360 importance of finding ways to support both resilience and wellbeing, development
361 actions need to acknowledge the complexity of these concepts whilst finding practical
362 ways to reconcile and apply them. The social theories underpinning wellbeing for
363 example can help to integrate social concepts (e.g. agency) into resilience thinking [54].
364 On the other hand, resilience scholars draw on concepts from systems science to
365 unpack how society and the environment might respond to change, which can occur
366 suddenly or gradually and can be environmental, social, economic and/or political in
367 nature. Cultural aspects are increasingly being highlighted through lessons from cultural
368 evolution [55]. These concepts can enable a more dynamic understanding of how such
369 changes shape poor people's wellbeing over time, including their ability to benefit from
370 ecosystem services and their capacity for resilience. Whilst wellbeing and resilience are
371 intertwined, the relationships are complex and contingent [56]. We argue that a deeper
372 understanding of the synergies and trade-offs between these two concepts can help in
373 predicting the unintended consequences of development interventions and can
374 therefore build on the growing body of literature on maladaptation which focuses on the
375 negative impacts of adapting to shocks [43]. We further argue that it can help address
376 power imbalances for two reasons. First, the **power to identify** tensions between
377 wellbeing and resilience relies on appropriate framings and methodologies which are
378 able to identify trade offs in the first place. Second, is that the **power to address** those
379 trade-offs relies on (often unequal) levels of voice, agency (defined as the power to
380 make a decision and act on it), and political will. This is becoming more recognised in
381 the literature. For example, Daw et al 2015 demonstrate the integration of

382   multidimensional wellbeing into participatory social-ecological system analysis for small-
383   scale fisheries in Kenya [57]. This enabled a clearer recognition of a range of impacts
384   from different scenarios on different user groups. It highlighted that whilst win-wins
385   between conservation and profitability could be seen at an aggregate scale, it obscured
386   the fact that the less powerful and more marginalised stakeholders within the
387   community were differentially influenced by management decisions.

388

389   Specifically, the combination of methods illuminated a trade-off between fisheries
390   productivity and lost earnings from women fish traders, who are reliant on cheap 'trash'
391   fish caught using illegal beach seining. As a result, the plight of beach seiners and
392   women fish traders became central to workshop discussions, and how to lessen the
393   disadvantages experienced by these groups. The unanticipated negative impacts on
394   different people for example, can therefore be clarified by understanding multiple
395   domains of wellbeing. To help promote synergies, we suggest a further three sets of
396   actions for practitioners to help policies and interventions support both wellbeing and
397   resilience.

398

399   First, we advocate a more process-driven, systemic and dynamic understanding of
400   resilience that measures persistence, adaptation, and transformation in response to
401   multiple disturbances through time. Attempts to specify and assess resilience often limit
402   resilience to the ability to withstand or resist a specific disturbance despite tensions
403   between specific and more general resilience [58]. Resilience thus needs to be thought of
404   as the capacity for ongoing adaptation and even transformation in response to diverse
405   and often co-occurring environmental as well as socio-political shocks and stressors [59].
406   Methodological approaches have been developed that support a more inclusive
407   analysis of resilience, which is more likely to support long-term wellbeing. Tools such as
408   Wayfinder[60], for example, lead stakeholders through a process of exploring their
409   social-ecological system and the changes, capacities, opportunities and strategies that
410   can adapt or transform the system in line with aspirations and priorities.

411

412 Second, policy makers and practitioners should adopt a more complete and holistic
413 understanding of wellbeing not only as a state, or property of individuals, but also as a
414 multi-dimensional phenomenon that emerges from people's interactions with each other
415 and their environment[5]. Increasingly, the pursuit of wellbeing is not seen as progress
416 on unidimensional metrics. A variety of approaches, such as the 3D [28] approach, and
417 their associated participatory tools, can better capture multiple domains of wellbeing
418 and the diversity of people's aspirations. They also enable understanding of how
419 wellbeing is related to broader processes of change in people's relationships.

420

421 Third, emphasise that resilience and wellbeing are socially differentiated across spatial
422 and temporal scales making the process of operationalising these concepts in
423 programmes and interventions inherently political [61]. Across **temporal scales**, possible
424 trade-offs exist between short-term gains in, and long-term risks to wellbeing (and vice
425 versa) as a result of loss of resilience. Approaches that incorporate long-term horizons,
426 such as participatory scenario planning and the structured consideration of future
427 generations' interests, can engage with such temporal interactions between resilience
428 and wellbeing[62]. Equally, interventions should be evaluated according to how they affect
429 wellbeing and resilience at different **spatial scales** and with caution for how
430 interventions may create new vulnerabilities [25]. Resilience in particular can be thought
431 of as individual, community or social-ecological system resilience[63] and consideration to
432 the interactions across these scales is key. Similarly, wellbeing can refer to individuals'
433 or a more aggregate measure of community wellbeing [64]. Available tools such as
434 watershed approaches and shoreline management plans can expand system
435 boundaries to include a broader range of stakeholders and consider effects that cross
436 from one place to another or occur across scales.

437

438 These trade-offs and differences across scale mean that wellbeing and resilience of
439 diverse groups of people are differentially affected by attempts to build system-level
440 resilience or improve wellbeing. This **social difference** and the power imbalances that
441 shape them, must be considered in the development of policies and plans in order to
442 support equitable and socially just outcomes. Techniques such as community profiling

443   can identify key social and demographic factors that structure society in a given context,
444   in order to facilitate disaggregated analyses and consideration of equity and social
445   justice. In particular, this can help in identifying those more powerful individuals or those
446   more marginalised who may have less ability to voice their opinions on how they might
447   be impacted by interventions. These can be coupled with advances that identify
448   different types of trade-offs between environmental and/or social objectives across
449   temporal, spatial scales and between groups of individuals[65,66]. Mapping out the roles
450   and interdependencies of different groups within these trade-offs, for example based on
451   wealth or gender, can help decision-makers and stakeholders to trade-offs and their
452   implications for equity[67]. Ultimately, genuinely co-creative approaches that are grounded
453   in people's own experiences that aim to counter differential access to power,
454   knowledge, and resources are needed to support equitable outcomes [68]. Of course,
455   these interventions do not take place in a political or institutional vacuum; the wider
456   economic, social and political relations will also determine whose interests, values and
457   knowledge are prioritised and influence what policies and programmes and funded and
458   implemented [69].
459
460   Programmes will need to adopt holistic and broad interpretation of both resilience and
461   wellbeing whilst acknowledging multiple temporal and spatial scales and the inherent
462   uncertainties in these. The appropriate approaches and techniques used to reconcile
463   wellbeing and resilience goals will differ across different social-ecological contexts.
464   Thus, experimentation and learning, drawing on the knowledge and experience of
465   multiple perspectives will be needed, as proposed by the adaptive management
466   approaches from the resilience and resource management fields [70]. Such approaches
467   can support an adaptive process of learning through doing (Fig.1c). Hard choices will
468   need to be made where resilience or wellbeing strategies are prioritised, especially
469   when trade-offs are unavoidable. A fuller understanding of the complexities of the
470   resilience and wellbeing relationship may help uncover some of the tensions and
471   anticipate some of the potential consequences, but to make decisions and navigate
472   these trade-offs this information is unlikely to be sufficient, there will be a need to
473   assess both the facts and our values and bring them together to make decisions [71].

474 Nevertheless, we highlight some mechanisms for reducing or avoiding trade-offs and
475 navigating towards outcomes that deliver on both wellbeing and resilience objectives.
476 These innovations could prove critical for meeting global sustainability challenges.
477

478 **Contributions**
479 T.C. and K.B. led the writing of the paper, T.M.D., S.C. and L.S. were part of the core
480 writing team. All authors contributed equally to conceptualisation and editing. All authors
481 have read and agreed to the published version of the manuscript.
482

491 **Competing Interests**
492 The authors declare no competing interests.
493

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659   Figure 1 – The narrow pursuit of resilience (1a) and wellbeing (1b) does not always lead

660   to synergistic outcomes. An adaptive process of learning through doing is required to

661   reconcile wellbeing and resilience for sustainable development (1c).

imagined
synergy

increasing wellbeing

decreasing wellbeing

increasing resilience

imagined
synergy

increasing wellbeing

decreasing resilience

increasing resilience

increasing wellbeing

increasing resilience