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Irreplaceable Goods: Bridging Sustainability and Intergenerational Sufficiency

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ABSTRACT

In 1987, the Brundtland Commission urged nations to improve present conditions without compromising the ability of future generations to meet their needs. Against the background of this appeal for sustainable development, there is a call for intergenerational justice, under a sufficientarian framework. Despite their strong relation, we claim that, to some degree, intergenerational sufficientarianism disregards relevant sustainability notions. This neglect undermines intergenerational sufficientarianism in the context of sustainability, here operationalized as sustainable development. In response, we propose the concept of irreplaceable goods as a necessary bridge between the two frameworks. Simultaneously, we stress the need for scholars to consider sufficientarianism as a valid alternative to egalitarianism for achieving resource justice. To harmonize intergenerational sufficientarianism and sustainability, we firstly delineate sustainability theoretical notions that influence fair distributive futures. Secondly, we incorporate those sustainability constraints into the conceptual background of intergenerational sufficientarianism. We also establish the concept of irreplaceable goods as a pivot and anchor for further theoretical development on the sufficient well-being of future generations. Finally, we discuss the implications of this concept in terms of expenditure and investment by contemporary people. With the proposed adjustments, we advocate that intergenerational sufficientarianism is a robust framework to deliver just futures.

KEYWORDS

Irreplaceable goods;
intergenerational justice;
intergenerational
sufficientarianism;
sustainable development;
planetary boundaries

Introduction

Justice toward future generations (FGs) is a term commonly used to characterize what is fair to leave to non-contemporaries, along with how political decisions taken today will affect the generations to come. Reflecting on moral permissibility toward future people does not implicate the consideration of specific physical constraints. However, the integration of ecological, sociological, or economic principles in the intergenerational justice framework benefits its theoretical development and applicability to present developmental action.

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Fairness toward FGs relates directly to the current societal attempt to act and develop under a paradigm of sustainability. Sustainability itself has a moral essence concerning justice, which was stated by the World Commission on Environment and Development in 1987. Their final declaration pointed to the intergenerational obligations of present people to conduct a 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development & Brundtland, 1987, p. 41). With time, the international consensus on the Sustainable Development (SD) path (as exemplified by the UN Sustainable Development Goals) evolved to no longer aim for guaranteeing the needs of future people, but rather for making sure that they will have the same conditions as present generations do (Holden et al., 2017).

Departing from this divergence, we problematize the necessary relation between what can be considered fair to leave to FGs and the type of eco-socio-economic development society chooses or should choose to take. We assume what Zuber (2016, p. 66) calls the second approach to intergenerational sustainability, in the sense of focusing on 'the consequences of current generations' actions on the opportunities of future ones', and address the question of whether we have the necessary conceptual tools to devise what is fair for FGs under the assumption of sustainability.

Given the fact that sustainability and SD are immersed in debates about their meaning and possibilities for application (Ruggerio, 2021), we believe relevant to describe them early on. We use Sterling's and Diesendorf's formulations of sustainability and SD (Diesendorf, 2000; Sterling, 2001) as a basis for our own. We define these concepts as follows: there is a desired societal dynamic equilibrium state (sustainability) that can be achieved through a path of actions that can be roughly described as sustainable development. In this definition, the inherent normative dimensions of sustainability and SD are not evident. However, they exist mostly associated with what actions are considered to be 'right' and 'adequate' (SD) to achieve such a societal state considered to be good (sustainability) (Blewitt, 2014; Salas-Zapata & Ortiz-muñoz, 2019). We further add that there is no genuine possibility of creating even a minimal state of future well-being, and theoretically legitimizing it, if we do not integrate core principles of sustainability into the justice equation. In reverse, the conceptual development needs clearly to address justice claims, not only from present but also of future people, in order to be coherent with the inherent time dimension of sustainability.

In the case of this article, we take a sufficientarian view of the justice pattern for intergenerational justice (Page, 2007a). The substantive perspective of intergenerational sufficientarianism comprises three sustainability capitals: environmental (e.g. water), economic (e.g. commodities), and social (e.g. peace) capitals. We consider that, independently of the specific characteristics of each good or service, what should be passed on to future people falls into one of these categories.

One goal of this article is to propose sufficientarianism as a reliable alternative to egalitarianism with respect to intergenerational justice. We also want to contribute to the intergenerational fairness debate by using the Earth's physical limits concept as a starting point in challenging particular principles of intergenerational sufficientarianism. Additionally, we aim at providing further justifications, directly targeted at sustainable development scholars, about intergenerational sufficientarianism as a valid alternative to egalitarianism when conceiving fair futures. We advocate intergenerational

sufficientarianism aligned with strong sustainability. Moreover, we support a vision of strong sustainability that goes beyond the environmental capital (Earth's physical limits) and extends to some social goods. In this regard, the novelty of the article resides in the attempt to harmonize the distributional principles of intergenerational sufficientarianism with a strong stance on sustainability, while extending them to specific social goods. These last proposed stances and arguments are our prime contribution to intergenerational sufficientarianism.

For a satisfactory adjustment of sufficientarianism to the premises of strong sustainability, we consider it necessary to introduce the concept of irreplaceable goods. This concept helps to single out the crucial resources and services for FGs' (minimal) well-being.

The organization of the paper is as follows: after the introduction, we describe a few sustainability principles we consider relevant to addressing intergenerational sufficientarian claims. Following this, we enunciate general sufficientarian principles that need consideration under the paradigm of sustainability. The central discussion about the new characteristics of sustainable sufficientarianism is held afterward. The last section is devoted to conclusions and suggestions for further development of sustainable intergenerational sufficientarianism.

Sustainability Core Principles: In Theory and Practice

In this section, we briefly describe the general characteristics of sustainability, as sustainable development, which influence the debate on intergenerational justice. Mostly, we focus on what should be left to FGs and the conditions for that to happen.

Sustainability as a Goal: The Pathway of Sustainable Development

The multiplicity of particular significances of sustainability in the context of the FG justice debate requires the establishment of some fundamental characteristics of this concept. As Christen and Schmidt (2012, pp. 400–410) write, the question 'What is to be sustained?' seems relevant in connection with fairness and legitimacy. For reasons of simplification and adequacy to the aims of the paper, we adopt a three-dimensional approach to the sustainability capitals (Lozano, 2008) understood here as aggregations of goods and/or services. These capitals can be flows or stocks, which are necessary for the functioning of the eco-socio-sphere.

Our stance is independent of a particular model of sustainability and is the following: the capitals that are included in any sustainability model are characterized by being ecological (natural resources, sinks, and processes), economic (manufactured and financial capital) or social (human and social capital).

Sustainability sciences devote relevant work to establishing the current and future state of potential goods that constitute the sustainability capitals. A recurrent theme in sustainability literature concerns the evaluation of natural resources (Bertram & Graedel, 1995), economic assets (Arrow et al., 1995; Kotlikoff, 1992) and social goods (Rangel, 2003). In many cases, the analysis of such resources or goods is justified by the tacit supposition that future populations will need them.

Examining sustainability capitals' characteristics (Noël & O'Connor, 1998) makes clear the areas where they do not overlap in their potential to enable human well-being or capabilities. The impossibility of replacing some goods with others of a different kind (Neumayer, 2003) compels us to defend a strong sustainability paradigm. Moreover, we acknowledge the existence of ecophysical limits and efficiency maximums, dictating a limited compensation between goods and capitals ('dimensions') (Frigo, 2018). In contrast to weak sustainability, strong sustainability assumes limited substitutability between natural capital and other forms of capital (Pelenc & Ballet, 2015). Under the paradigm of strong sustainability, certain elements are crucial due to their unique contribution to human well-being (Ekins et al., 2003).

Accordingly, we rely on the notion that present and future human well-being cannot be reached by a complete substitution of specific capitals by others of different nature (Ekins, 2003; Neumayer, 2012).

Looking closer at the natural capital, we claim that despite future technological progression, it is impossible to overcome certain limits of the biosphere, i.e. some of the existing stocks and flows from natural capital cannot be duplicated by manufactured capital. As an example, it is possible, with substantial financial investment and enhanced technologies, to mimic some natural plant reproduction steps. However, (insect) pollination cannot be entirely replaced by human-made strategies (Kim & Weaver, 1994). Besides substantial scientific evidence to support our position (Holland, 2002; Huesemann, 2003), there are also ethical (justice) arguments for strong sustainability. As Ott (2003) points out in his second argument for strong sustainability, the people who choose to live by the 'green virtues' should have the conditions to do so, and not be forced to relinquish natural capital. In alignment with his position, we argue that, for example, monetary currency cannot represent or fully replace the value of landscapes (Jackson, 2006), animals and plants for indigenous people (Inoue, 2018).

Despite our strong view on sustainability, we do not repudiate some degree of substitution. Rather, we do not accept total interchangeability of capitals. This stance translates into the argument that an intergenerational justice framework that considers full replacement of capitals is not adequate to concede justice to FGs. We stress that the irreversibility caused by depletion and destruction of certain goods above particular levels compromises FGs at a sufficiency level. e.g. a severe loss of insect biodiversity compromises ecosystem services and food security by decreasing crop yield.

We do not believe it necessary to provide a concrete description of what goods should be left for FGs to support our arguments for non- total substitution. We reason that whatever type of stocks and capitals are being passed on, the transmission should occur under the paradigm of strong sustainability to guarantee the continuity of, at least, a minimum quality of life.

From non-total interchangeability of sustainability capitals arises a second relevant question: 'How to sustain future well-being?' This interrogation leads to an examination of what exactly SD is. We define SD as a socio-developmental process toward sustainability, which cannot be achieved without a 'dialogue of values' (Blewitt, 2014, p. 6) with the ultimate aim of improved (human) well-being. Earth's systemic limitations – popularly referred to as planetary boundaries – physically constrain SD. We refer here to planetary boundaries as evolving safe operating spaces for human action (Rockström et al., 2009). The incorporation of this concept in the SD discourse converts the approach to

environmental capitals to an 'absolute environmental sustainability' (Clift et al., 2017, p. 279). Consequently, we affirm that the intergenerational justice debate cannot bypass the full acknowledgment of Earth's physical boundaries without becoming weaker.

Another cross-cutting question for both intergenerational justice and sustainability is 'What is sustainably fair?' i.e. how should goods be allocated among generations respecting the principles of sustainability? In this case, the two traditions have strikingly different visions. In the philosophical arena, the diversity of theoretical frameworks for approaching justice is evident (Meyer & Roser, 2009), but the same does not happen in sustainability and SD areas.

When scientists envisage and justify SD, they mostly resort to concepts of justice and equity-based on welfarism and egalitarianism (Fitzpatrick, 2001; Wilkinson et al., 2010). Publications of reference tend to present a monolithic outlook on the subject. Authors tend to regard the well-being of FG in terms of resources and stocks (Agyeman, 2005, Pearce, 1988), not for example, in experiences or capacities, which we believe to be counterproductive and misleading. We endorse authors like Hopwood et al. (2005) who state that SD has a justice dimension from where environmental concerns stem. However, we disagree with the authors' position, which subscribes to the obligation of an egalitarian distribution, especially in an intergenerational context. For such authors, the prime objective is to uphold a kind of equality among generations concerning certain justice 'currencies' (e.g. welfare, rights, resources). In the view of egalitarians, relative differences of state should be eliminated or reduced between generations (Gosseries & Meyer, 2009). In our case, we do not confer value to equality in itself when considering what kind of distribution among generations should there be.

A similar hegemonic scenario of adoption of an egalitarian stance happens in the political discourse (Fukuda-Parr, 2016; Gupta & Vegelin, 2016). Political discourse indirectly reinforces the predominance of egalitarianism in the SD context, by not clarifying sufficiently to which generations we are trying to concede justice (Vasconcellos Oliveira, 2018). Despite the technical evolution in SD scientific and political literature, sustainability scientists still believe that if an intragenerational egalitarian SD framework is created, justice toward FGs will ensue. Take the example of Holden et al. (2017) or Schroeder and McDermott (2014, p. 31), who claim that the inclusion in SD of egalitarian 'imperatives' and Rawlsian justice principles respectively will directly guarantee fairness in FGs.

Our argument for looking outside of egalitarianism for intergenerational justice is further justified by authors like Gosseries (2016), who describes several limitations of this framework. As Piacquadio (2014) mentions for resource distribution, it is not possible to maintain equity between generations in the long term. Furthermore, we evoke as a particular limitation to egalitarianism (under a sustainability paradigm), the fact that human activity has already broken some of the safeguard ceilings (Steffen et al., 2015). Particular planetary boundaries have already been exceeded to such a degree (e.g. biodiversity loss, nitrogen cycle) (Steffen et al., 2015) that it is impossible to leave an equal amount of resources, services, and conditions for FGs, especially in the long term (O'Neill et al., 2018). The potential (total and substantial) substitution of such resources, services, and conditions by others of a different kind (even if of the same 'value'), is not likely in many relevant cases, as with insect pollination (Kim & Weaver, 1994).

The ethical and physical limitations to egalitarianism should open the door to the consideration of other justice theories. We argue that sufficientarianism can be a reliable

alternative for a fair future (Meyer & Pözlner, 2022; Meyer & Roser, 2009), and therefore politicians and scientists should consider it when reflecting on future scenarios. However, for intergenerational sufficientarianism to be a reliable alternative to intergenerational egalitarianism, it must address the implications of the planetary boundaries.

In the next section, we briefly present and discuss some main features of intergenerational sufficientarianism, in light of sustainability and SD.

What is Sufficiently Fair for Future Generations?

We view intergenerational sufficientarianism as a theory of justice that focuses on the well-being of future people in relation to a threshold, and not in connection with the equality among individuals of different generations (Gosseries, 2011; Page, 2007b) i.e. a kind of ‘minimum-satisfaction’ egalitarianism. According to this perspective, it is more important to benefit someone who is below the sufficient level than another who is better off (even if below the threshold). Justice (fairness) is understood here in absolute terms and concerning the ability to achieve a certain previously defined threshold. Strictly speaking, equality is not an adequate measure of justice, as it is necessary to establish a minimum level to guarantee intergenerational fairness.

From a theoretical perspective, sufficientarianism is compatible and combinable with other intergenerational justice perspectives such as egalitarianism (Meyer & Roser, 2009), even in an intergenerational context. In spite of critical differences between sufficientarianism and egalitarianism, sufficientarian criteria are in accordance with some forms of egalitarianism and utilitarianism (due to the aggregative perspective on well-being) (Gosseries, 2011).

Note that both the latter and prioritarian perspectives have non-individual reasoning. Their objective is set on total welfare. Despite some degree of conceptual convergence, we will continue to focus just on intergenerational sufficientarianism.

Moving now to the characteristics of intergenerational sufficientarianism that will differ from the ‘classic’ intergenerational sufficientarianism when sustainability principles are applied, we start by considering ‘inheritance’. What is to be transmitted (capitals in the form of goods and/or services) and the fair level of such a distribution forward directly influence the well-being of coming generations. Such influence also exists when considering other justice currencies like welfare, rights or capabilities. It is important to note that we do not consider different types of currencies of justice to be interchangeable. However, such differentiation does not affect our argumentation or reasoning, so we will continue to mention them together.

Intergenerational sufficientarianism is non-cleronomic. We follow here the Gosseries approach (Gosseries, 2011, 2016) to cleronomics. According to this author, cleronomic principles define what present generations owe to future ones based on what they have received from previous generations. Strictly speaking, the pattern of distribution of goods and burdens considered just depends on what each generation inherited from the preceding one (Gosseries, 2016). Consequently, the baseline may vary accordingly to each generation’s notion about obligation toward the next and to the degree of observance of those obligations. In this sense, justice theories which are cleronomic do not just focus on what current generations inherited but also on what they owe to future people. Theories like egalitarianism or utilitarianism are cleronomic in the context of intergenerational justice, in contrast to

sufficientarianism. This theory does not consider what each generation receives from the previous one to establish the minimum required level for FGs. According to sufficientarianism, present people are not obliged to save and/or accumulate for FGs if future needs can be met up to a sufficient level. Nonetheless, the present generation cannot dissipate whatever they desire, because they hold a moral obligation to satisfy FGs' needs up to a minimum rank.

One of the strengths of sufficientarianism, within an intergenerational context, relates to the metrics (Gosseries, 2016). It is reasonable to say that the general necessities of people are rather constant over space and time, even if the resources to accomplish them may vary. Using nutrition as an example, one can expect that future food requirements for a healthy diet will not change dramatically geographically or temporally. We know that different diets meet quality and quantity requirements of present people, albeit in situations where some components are not easily available, as in the case of desert populations who trade to obtain foreign salt.

The same constancy holds for 'rights' or 'capabilities' sufficientarianism, as moral and human intrinsic characteristics over time and space are relatively constant. It is equally reasonable to consider that (basic) human rights, such as religious freedom, have not and will not substantially differ from the ones settled by the UN in 1948. This notion of rights should not be confused with Shue's view on basic rights as foundational for other rights (Shue, 1996) as this stance might not apply.

With high certainty, the basic individual capacity of achieving the kind of lives she/he/they has(ve) reason(s) to value is rather constant, even admitting that the means to reach that standard vary considerably. The only exception is when the justice criterion is 'preferences'. In this case, the metrics advantage of intergenerational sufficientarianism does not apply since FG can be influenced by external factors. There is not necessarily a constancy of preferences' profile among generations. For example, formal education and media have the potential to shape the preferences of future populations. In subjects like food or transportation, schools and TV have influenced consumers to choose increasingly more non-meat products and electric vehicles.

On the subject of demographics, sufficientarianism is sensitive to variations in population size (Gosseries, 2011). This characteristic is particularly relevant in the context of SD because we face constant fluctuations in the number and distribution of planet inhabitants (Lutz et al., 2001), affecting globally and locally the allocation of resources.

A side aspect to intergenerational sufficientarianism, but relevant in the context of sustainability, is 'savings'. Although the concept of savings in intergenerational justice literature typically relates to the Rawlsian perspective ('principle of just savings') (Rawls, 1978), it has a place in an intergenerational sufficientarian approach too. According to the Rawlsian perspective, the 'principle of just savings' consists of the obligation of (a) generation(s) to save during a certain period ('accumulation phase'), until just institutions are firmly established and all the basic liberties effectively realized ('steady-state stage') (Paden, 1997). Strictly speaking, there are savings if a generation transfers to the next more than it inherited from the previous one. In contrast, there are generational 'dissavings' whenever a generation transfers less to the following one than it inherited from the previous generation (Gaspard & Gosseries, 2007). During the period of accumulation, besides savings, there might also be a place for investments, in the sense of creating better conditions (e.g. wealth) for achieving the phase of steady-state.

We consider that there is the possibility (in a single sufficientarian approach) or the necessity (in a Rawlsian and sufficientarian approach) of establishing savings for the present generation when capitals are necessary to meet a sufficient well-being threshold. As discussed in Gaspart and Gosseries (2007), it is plausible, in a consequentialist approach to intergenerational sufficientarianism, to justify restraint from spending even if only during an 'accumulation phase'. It is fair to burden present people with setting aside resources when the level of resources is at a stage where they should transfer more to the FGs (Rawlsian principle) to reach a minimum level (sufficientarian principle).

In the next section, we review the characteristics of intergenerational sufficientarianism mentioned previously in an attempt to articulate them with a sustainability perspective. In some cases, we propose new features to the framework so that FGs can attain a continuous state of sufficiency.

Irreplaceable Goods: The Foundations of Sufficiency

Independently of the substantive nature of the currency of justice, it is plausible to state that well-being (or welfare, rights or capabilities- though not interchangeably considered) is directly influenced by the quality and quantity of capitals as SD describes them (either natural, social and economic goods). Each type of capital includes different goods (e.g. natural resources, culture, and national savings) that are more or less vital for even a minimum quality of life for any generation. The existence of such elements, their level and quality influence the individual's general satisfaction with life, their social and material needs, their capacity in fulfilling what they can and want to achieve, and the actions and states they are entitled to.

Without going into detail on the concrete type of goods that should be part of an 'intergenerational sufficientarian basket', it is relevant to establish that some of them are more crucial than others. The criticality of some of these elements – which we define here as irreplaceable goods – is dual: on the one hand, they are foundational to a sufficient (and some even to a minimum) future life condition, and on the other hand, they are significantly affected by present eco-socio-economic development. In other words, there is a sufficient and, in some cases, even minimum condition for a future life that irreplaceable goods are essential for. Irreplaceable goods are critical elements for any human being in any generation. They are crucial goods for the pursuit of a future life with at least minimum conditions. Even if future humans could adapt to a world without (some of) them or to a condition where they would be below a certain threshold, they would still be better off with them (above a particular level).

In a canonical formulation, a good is irreplaceable if conditions (1) and (2) are both satisfied:

- (1) The good is absolutely necessary for sufficient life conditions in any given generation;
- (2) The state of the good is influenced by human development.

In some cases, irreplaceable goods cannot, by past, present and/or future actions, be (fully) recovered to desirable levels if they fall below certain thresholds (i.e. no total substitution possible). There are several examples of such goods within the

environmental capital. These include biodiversity, arable soil and freshwater, as they are particularly difficult to recuperate after disruptive human actions. Likewise, several natural irreplaceable goods form interrelated nexuses that support global ecosystems (Cardinale et al., 2012, p. 59; Dudgeon et al., 2006), and are accordingly both essential and susceptible to human activity. In this case, of their absence or if they fall below certain levels, human beings can become extinct.

We would like to add that natural irreplaceable goods are not equivalent to nonrenewable resources. In the notion of irreplaceability, we include a low or compromised renewability (e.g. soil quality) (Várallyay, 2007). In that respect, irreplaceable goods are closer to 'critical natural capital' (Ekins et al., 2003; Ekins, 2003). Irreplaceable goods share certain similitudes with these environmental (or natural) critical goods in the sense of being goods that perform important and not substitutional roles, which may include intangible functions (e.g. nature as heritage) and are needed for human well-being (Noël & O'Connor, 1998). Nevertheless, they are a broader category, which extends further than the natural realm. Irreplaceable goods also share similitude to Anderson (1997) 'incommensurable goods', in the sense of impossibility or great difficulty in value comparison. However, in the case of irreplaceable goods, there are pragmatic reasons to try to compare distinct goods. Biodiversity as an ecosystem service is such an example. Ecosystem services are an attempt to reduce natural goods to a 'monetary', and therefore comparable value (Bateman et al., 2011). This type of quantification makes clear how much society is in debt to natural capital (Schröter et al., 2014). Nevertheless, the commodification of nature reinforces the idea of total substitutability of natural capital, which, as we explained before, is far from true. Irreplaceable goods also have common features with social resources, since these elements may also be resources embedded in social networks and used by individuals for their actions (Huber, 2009). We interpret social goods and social capital in a similar way to (Wicks, 2009), p. 549). In his understanding, social goods are originated by the production or as an outcome of communities ('social sphere'), making them necessary for life in society and communities. According to the author, the most distinguishable characteristic, besides the fact that social goods are produced by communities rather than by markets or governments, is their inherent non-marketability, i.e. their character and value are changed unrecognizably if one attempts to market them or evaluate them monetarily.

In our perspective, social irreplaceable goods include only the vital resources for sufficient life conditions, which is not the case for the social resources, which integrate far more dimensions with some of them being substitutable (e.g. social status, money).

It is indisputable that there are elements which are and will be the substrate of at least a minimum standard of living that we would like to leave to FGs. Since they are part of the non-negotiable items in any possible 'sufficientarian intergenerational basket', irreplaceable goods deserve particular attention by sufficientarians. More importantly, and because the type of societal development undoubtedly affects the quantity and quality of such elements, sufficientarian principles are, in practice, dependent on the continued existence of these goods in at least a minimum amount, level and quality.

The concept of irreplaceable goods is a direct consequence of the adoption of a strong stance on (environmental) sustainability but extends beyond the sphere of the natural capital as the social dimension is also an integrative part of sustainability. We claim that

certain social goods such as human rights, culture, justice or peace are also fundamental for sufficient levels of well-being, rights, or capabilities. The concept of irreplaceable goods does not derive directly from a sufficientarianism stance on distributive justice, as previously explained but it incorporates 'sufficientarian characteristics' since they are absolutely necessary elements for sufficient life conditions. The sufficientarian stance taken here is to be understood in a sense of a positive thesis: there are moral reasons to secure enough specific social goods which are weighty and non-instrumental for human life. Guaranteeing that FG can achieve and or enjoy a certain level of certain social goods is not just about ensuring their 'social subsistence' but rather constitutive of respect for their agency. Moreover, we believe that such goods cannot and should not be replaced by others. In essence, what characterizes irreplaceable goods of a social kind are (1) being resources or characteristics originating from functioning communities that cannot be monetized, (2) essential to sufficient life conditions and (3) having no or negligible substitutability. As an example, exchanging peace for economic or natural assets does not seem desirable or even possible in contemporary society. At the moment, we see many cases (Afghanistan, Iraq) where the degradation of social, economic, and natural conditions due to armed conflict is such that even with an immediate truce, it will take many decades to reestablish a healthy environment for the populations. Consequently, we aver that if social irreplaceable goods are eroded to certain levels, the time and opportunity to recover them might be undesirably long or even inexistent, rendering them precious to both present and FGs. Moreover, material goods cannot be enjoyed without social conditions that enable their healthy use/consumption, e.g. peace, equity, human rights or education.

Despite the common characteristic of criticality, there is an important distinction between material and social enabling goods as irreplaceable goods: the distribution across generations is ontologically different. Material goods are protected from depletion by regulating use/consumption. Environmental goods such as soil, water, air or cultural patrimony should be protected from destruction or pollution so that they can still be enjoyed by future people and life forms. However, social enabling conditions, unlike these material goods, need to be enhanced by teaching children, for example, new ways of relating, regulating citizens' behavior to discourage racial discrimination, encouraging protest action to stop racist cultures and ways of relating, etc. These distinct ways of 'distributing' irreplaceable social goods tend to be figurative compared to the more literal consuming less/saving more for the future. Each type of irreplaceable goods calls for a different kind of justice; environmental and social material goods are susceptible to distributive justice and resource allocation, while other social enabling goods are to be acted upon through enacting elements such as civil rights or just politics of recognition. This also translates in different ways on how thresholds could look like for distinct types of irreplaceable social goods. For example, apart from a more quantitative understanding of thresholds, there should be space for others, such as levels, presence of factors or actions taken toward the enhancement of specific social goods which could (in)directly contribute to their existence or enactment. In such cases, the duty of determining or describing and upholding such limits would stay on the individuals and institutions that are involved in the inception of these resources and/or characteristics originated by contemporary communities.

It is also relevant to make clear that irreplaceable goods are not the only elements necessary to achieve sufficiency for FGs. The example of social acceptance shows that despite being critical to sufficient well-being, it might be substituted by social engagement without risking a decrease in overall well-being. Additionally, it is relevant to elucidate we do not hold a 'strict' resourcist conception of (intergenerational) justice. We reason those specific resources are indispensable, directly or via conversion ('capability-resource'- Clayton & Williams, 1999.) (Kelleher, 2015), for achieving sufficient levels of well-being (welfare, rights or capabilities). In that respect, we sustain that present generations should pass on the necessary amount, level or quality of 'special resources'- irreplaceable goods (with most likely other goods) to FG, enabling them to achieve sufficient standards of life.

In sum and due to the criticality of (all types of) irreplaceable goods for FGs, we believe it be crucial to demarcate these elements within the sufficientarian theoretic framework; that is, the distribution principles of sufficientarian intergenerational need to account for the characteristics of irreplaceable goods or fail to grant justice to FGs.

In the following sub-section, we revise the intergenerational sufficientarianism criteria, which are affected by SD principles, and by the differentiation of the irreplaceable goods.

The Shape of Sustainable Intergenerational Sufficientarianism

Following the strong stance on sustainability and the introduction of the concept of irreplaceable goods, we defend the revision of some intergenerational sufficientarian principles.

Looking again to the subject of inheritance of capitals and goods, we support a moderately cleronomic version of intergenerational sufficientarianism. We consider it necessary to ponder the inherited situation from past generations when establishing sufficientarian distributional claims. The need to open the door to cleronomic considerations derives from a strong sustainability stance and the existence of irreplaceable goods. The justification for this claim is that a minimum sufficientarian threshold, at least for the irreplaceable goods, is bounded by past actions.

On the matter of the potential need for present generations to save goods and capitals to prevent them from falling below the required sufficient threshold, we advocate the duty of refraining from spending certain capitals if sufficiency is in question. This follows the Kantian notion of 'negative duty' in terms of (non-)using the good when its level falls below a threshold. In the case of irreplaceable goods being social-enabling situations, there is a 'positive duty' of creating and fostering those conditions so FGs can enjoy them, at least, at sufficient levels.

In the case of the irreplaceable goods, we argue for saving and/or promoting the maintenance of the current level because of the low or impossible substitutability. When capabilities and rights are the sufficientarian justice currency, we find it advisable to extend the savings beyond basic goods as the fulfillment of sufficient capabilities and rights requires more elements than in a basic-needs perspective. For example, access to culture is not considered to be a basic need. However, the enjoyment of cultural goods favors the achievement of full citizenship and enables the individual to achieve a better life. In a scenario where capabilities or rights sufficientarianism is the justice framework, it is a moral duty to save not only basic goods, such as water, but also cultural goods like traditional music.

We comply with the sufficientarian notion of present generations' (possible) over expenditure ('dissavings') to the extent of not endangering future sufficiency (Gaspart & Gosseries, 2007). Nevertheless, we argue that when a capital level is above sufficiency, it is still possible to justify saving it for FGs on account of a 'precautionary' principle. We interpret here the precautionary principle as a mechanism to guarantee higher levels of present and future environmental and human protection through preventative decision-taking in the case of risk (Gardiner, 2006).

Despite the constancy over time of basic well-being, rights, and/or capabilities, there is an inherent degree of uncertainty regarding future eco-socio-economic scenarios that can serve as justification for not dissipating capitals.

Accounting for this degree of future uncertainty makes us consider investments for FGs desirable but not obligatory, except for the irreplaceable goods. As these elements are either critical for human well-being or (many) currently below a sufficient threshold (e.g. biodiversity, peace), we believe it to be mandatory for present generations to devote time and resources to reverse the current situation and promote future sufficiency, when possible. Since sufficientarianism is demographically sensitive, we should account for potential global or local demographic growth. In a scenario where there are more future people to share limited capitals, especially the irreplaceable goods, the addition of the investment and savings principle as described above adds consistency to intergenerational sufficientarianism.

The integration of the strong sustainability paradigm in intergenerational sufficientarianism also brings (potentially) controversial or counter-intuitive implications. One of them is the (non-) use of goods or resources that have been overshoot in terms of planetary boundaries. Using the example of freshwater use (European Commission, 2015), it would mean that present people, and most likely proximal FGs, could not use this resource, or in more plausible terms, they could only use fresh water in cases of 'extreme' need. At the same time, the current generation would have to save the resource as much as possible so future people could have it at a sufficient level. In such cases, it is easy to see the emergent intergenerational conflicts in the attainment of sufficient well-being.

(Gosseries, 2008a, 2008b) proposes a potential way to solve or diminish tensions between rival claims to irreplaceable goods (e.g. freshwater) by current and future generations. In such cases, the interests of contemporary people could be satisfied up a threshold not higher than the one that would jeopardize the achievement of 'minimum' needs from FG, even in the case of irreplaceable goods. The justification for such an option could be grounded in mitigation (potentially unnecessary) present suffering since there might be a possibility of (e.g. technologically) reversing (even if only to a very small degree) the status of overshoot irreplaceable goods.

The example of fresh water also shows how difficult it would be to deal with present and future (e.g. geographical, cultural) inequalities in access and quality of goods when setting minimum thresholds. Similar reasoning holds for the responsibility of saving irreplaceable goods. There are other associated uncertainties connected to the investment of efforts in savings: how and to what extent can/must present generations invest in irreplaceable goods when they are by design difficult or might be impossible to recover when they fall below certain levels. The recovery of fresh water is not the most difficult case since there is already technology for (at least partially) accomplishing this task. Nevertheless, in the case of the nitrogen cycle or

endangered cultures, we may be far away from knowing how to recover their integrity (if it is possible at all).

In summary, the alignment of the intergenerational sufficientarianism theory with sustainability criteria requires more nuanced justice principles and acquiescence to the present eco-socio-economic landscape. Furthermore, it raises difficult questions and requires the present generation's efforts that might be, in some cases, very hard (or even impossible) to make.

Conclusion

Developments in sustainability studies ripple outside the traditional natural and political sciences. In the field of environmental and distributive justice, scholars are trying to make sense of the theoretical implications of these developments in the classical frameworks. This work seeks to clarify some of the effects of the relatively recent sustainability concept of planetary boundaries in the context of the intergenerational justice debate. The idea of limits to human development is not new to either environmental sciences or ethics. However, the consequences for FG justice of such boundaries are yet to be fully developed and understood.

Scenario building is increasingly becoming a preferred tool for sustainability scientists since it allows them to explore different narratives for SD. In any future scenario, it is central to establish a just distribution of environmental burdens and benefits. So far, sustainability and SD scientists have considered mainly egalitarian distribution principles. We challenge this approach on both ethical and environmental grounds and propose intergenerational sufficientarianism as a valid alternative.

For intergenerational sufficientarianism to be a credible option for granting justice to FGs, it must incorporate the planetary boundaries framework. This would facilitate the generalized acknowledgment of its potential by scientists and politicians.

In this article, we propose adjustments to some core principles of intergenerational sufficientarianism and the distinction of irreplaceable goods. The concept of irreplaceable goods is a direct answer to the acknowledgment of planetary boundaries and the adoption of a strong sustainability paradigm. We consider that low or non-substitutability of certain natural and social goods renders them vital for any fair future scenario. Envisioning a general sufficient, and in some cases, even minimum threshold of well-being, rights, or capabilities without considering and specifying irreplaceable goods makes the exercise futile.

The establishment and integration of irreplaceable goods in intergenerational sufficientarianism require other theoretical adjustments. The creation of minimal conditions for FGs entails the consideration of how inherited levels of irreplaceable goods affect the capacity and moral responsibility of present generations to leave these goods for the future. The existence of irreplaceable goods also makes their savings compulsory for present people, which triggers challenging implications in a concrete implementation scenario. Such principles could have very concrete implications in SD governance, for example in scientific scenario making. In this case, for example, the storylines would have to include additional guiding principles and constraints so to guarantee that FG would benefit from irreplaceable goods.

Despite the potential concrete application of irreplaceable goods in governance strategies, the concept itself is not without probable objections. For example, the ongoing discussion between ‘resourcists’ and ‘non-resourcists’ on the metrics of justice can be contextualized here. Another source for debate can be how to make sense of the concept under other justice frameworks (e.g. egalitarianism). In the case of the first objection, a ‘non-strict resourcism’ stance can be a promising approach. Pertaining the second challenge would most likely require a publication on its own. However, it seems plausible that irreplaceable goods should not be immediately rejectable outside sufficientarianism, as this justice theory is compatible with some forms of egalitarianism.

Despite the theoretical and practical challenges of integrating this concept of irreplaceable goods in the debate of justice for future people, it helps sufficientarianism to be a better alternative in the context of SD.

In summary, the harmonization of sufficientarianism with SD principles drives both frameworks further and supports SD governance. The main advantage of bridging these two knowledge fields comes from enhanced applicability of fairness principles in practical political contexts. We believe our contribution to be just a small part of the overall effort to build a sustainable and fair tomorrow.

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