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Which direction for sustainable development? A time series comparison of the impacts of redistributive versus market policies in Bolivia and South Korea

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Abstract

This article examines two major policy frameworks for achieving sustainable development: the market-based 'Green Economy' approach (exemplified by South Korea), and the redistributive 'Living Well' approach (exemplified by Bolivia). We compare the two paradigms in qualitative terms using document analysis, and we assess quantitatively how they have fared in terms of delivering progress towards sustainable development in each country. Time series data for the Sustainable Development Index and the Gini index were examined. The results show that, since 'Living Well' was initiated, social outcomes have continued to improve in Bolivia and, while emissions and material footprint have increased, they remain low and within or near sustainable boundaries. By contrast, South Korea has regressed in terms of sustainability. Social indicators have improved, but the Green Economy policy has failed to reduce ecological pressures. This raises significant questions about the legitimacy of the Green Economy paradigm as a model for achieving sustainable development.

KEYWORDS
economic growth, environmental policy, equity, socialism, sustainability transitions, well-being

1 | INTRODUCTION

Humanity faces multiple environmental and social crises requiring urgent and profound changes to our societies (e.g., IPBES, 2019; IPCC2, 2021). What this change should look like is highly contested, not only in detail, but in broad direction. This article addresses this debate, considering what political, economic and social policy pathways countries can take to achieve an equitable, just and effective transition to a sustainable society. We focus specifically on two essentially opposed environmental/social paradigms: the market-based 'Green Economy' approach exemplified by South Korea, and the redistributive 'Living Well' approach exemplified by Bolivia. These are examined in terms of their relative merits for helping to deliver 'sustainable development' in the two countries, with reference to their performance on the Sustainable Development Index (SDI) (Hickel, 2020a), its component social and ecological indicators, and the Gini index. The two countries are compared against others in their regions, as well as against countries with similar starting SDI scores.

1.1 | Background

The planetary boundaries framework (Rockström et al., 2009; Steffen et al., 2015) highlighted the '…urgent need for a new paradigm that integrates the continued development of human societies and the maintenance of the Earth system (ES) in a resilient and accommodating state' (Steffen et al., 2015, p. 736). Yet, progress towards achieving sustainable development continues to be slow. Even before the

COVID-19 pandemic, the Civil Society Reflection Group, which reports on progress towards the Sustainable Development Goals, gave the following overarching assessment: 'The world is off-track in terms of achieving sustainable development and fundamental policy changes are necessary to unleash the transformative potential of the SDGs' (Civil Society Reflection Group, 2018, p. 9).

The term 'sustainable development' was put forward in the WCED's Brundtland report (Brundtland et al., 1987, p. 43) as, 'development that meets the needs of present generations without compromising the ability of future generations to meet their own needs'. This definition is used in much of the literature though it has, for some time, been a contested concept (e.g., Barkemeyer et al., 2014; Imran et al., 2014). Sustainable development is usually considered to be comprised of three pillars—economic, social and environmental (e.g., Ukko et al., 2018; Wichaisri & Sopadang, 2018) and the contestation usually arises regarding where the emphasis should lie. Many have discussed the difficulties of measuring progress towards sustainable development at the national level (e.g., Banister et al., 2015) and for making international comparisons (e.g., Halisçelik & Soytas, 2019). Following recent literature in ecological economics (e.g., Fanning et al., 2022; O'Neill et al., 2018), we specify that the objective of sustainable development must be to ensure decent lives for all within planetary boundaries—or ecological limits more broadly.

Over recent decades, numerous paths have been suggested to accelerate the achievement of sustainable development. Several authors have argued (e.g., Harangozo et al., 2018) that it is particularly important to examine alternatives to the conventional growth paradigm. Among the many recent macro-level 'experiments' in transitioning to sustainability, 'Green Economy' and 'Living Well' are among the most prominent. The former because it is currently the dominant model internationally, and the latter because it has developed outside of the major global institutions and as a challenge to them. Interpretations of Green Economy and Living Well vary but there are clear overall differences. The earliest adopters of these policy paradigms at the state level (South Korea and Bolivia, respectively), took very different positions on these five matters:

- The roles of markets, the state and the community in achieving sustainability;
- The necessity of maintaining a growth-based economy;
- The relative emphasis on technical versus social solutions;
- Whether solutions can be applied incrementally within current economic structures;
- The extent to which inequality is considered and addressed.

In particular, 'Green Economy' is generally promoted as consistent with, and supportive of, a capitalist political economy. 'Living Well', on the other hand, has been developed as part of a process of change leading to socialism in the countries where it has been adopted (i.e., Bolivia and Ecuador). This links to an ongoing political debate about whether capitalism is compatible with sustainability or whether, as the source of environmental and social crises, it could ever be part of a solution (e.g., see Bell, 2014, 2015; Magdoff & Foster, 2011). It also speaks to earlier comparisons of socialist and capitalist states in terms of their efficiency in delivering improvements in social outcomes (e.g., Cereseto & Waitzkin, 1986; Lena & London, 1993; Navarro, 1993).

'Green Economy' was a dominant policy paradigm[1] in South Korea between 2008 and 2017, under the governance of President Lee Myung-bak and his successor, Park Geun-hye. With the election of Moon Jae-in in 2017 policies took a radical redistributionist turn, accompanied by some abandonment of nuclear power which was central to the former 'Green Economy' paradigm. The period during which 'Living Well' was a prevailing paradigm in Bolivia began earlier, in 2006, with the election of the MAS (*Movimiento al Socialismo*—Movement for Socialism) government led by Evo Morales and still continues, with a year long hiatus from 2019 to 2020 resulting from the so-called 'lithium coup' (Harasim, 2020). However, in both cases, the roots of these paradigms can be traced to much earlier discourses and worldviews. It has been argued that Green Economy, 'Green Growth' and 'Ecological Modernization', while of different origins, are difficult to differentiate (e.g., Allen & Clouth, 2012; Hayden, 2014). Living Well, or Vivir Bien/Buen Vivir, in Spanish, is rooted in the worldview of Andean Indigenous groups and so has a much longer history (Gudynas, 2011).

Green Economy has been widely promoted by governments, policy-makers and businesses over the last decade because of its apparent promise to deliver economic growth while simultaneously addressing climate change. In particular, Green Economy gained prominence through international development agencies, particularly the UNEP, World Bank and OECD. For example, in 2011, UNEP stated '… the greening of economies has the potential to be a new engine of growth, a net generator of decent jobs and a vital strategy to eliminate persistent poverty' (UNEP, 2011, p. 16).

However, the Green Economy has attracted significant criticism. Researchers have argued that it may not be feasible for high-income countries to achieve sustainability objectives while continuing to increase aggregate production at the same time (e.g., Haberl et al., 2020; Hickel & Kallis, 2019; Ward et al., 2016). The Green Economy paradigm was also criticised for its perceived neglect of the social consequences of the policy (e.g. at the People's Summit for Social and Environmental Justice, 2012); its favouring of corporate interests; and promotion of risky technologies. For example, the Indigenous People's Global Conference on Rio+20 and Mother Earth, stated:

> …We demand that the United Nations, governments and corporations abandon false solutions to climate change, like large hydroelectric dams, genetically modified organisms including GMO trees, plantations, agrofuels, "clean" coal, nuclear power, natural gas, hydraulic fracturing, nanotechnology, synthetic biology, bioenergy, biomass, biochar, geoengineering, carbon

[1]In discussing LW and GE as distinct 'paradigms' in Bolivia and South Korea, we do not imply that all actors in the country are unable to think outside of this dominant framework, a critique that has been made regarding the use of this term (e.g., Cartensen, 2011). LW and GE have been contested within and beyond the country in each case.

> markets, Clean Development Mechanism and REDD+ that endanger the future and life as we know it (from the Kari-Oca II declaration, 'Indigenous People's Global Conference on Rio+20 and Mother Earth' 17th June 2012).

Criticism also came from the Latin American countries aligned to ALBA (Bolivarian Alliance for the people of our America) (Bell, 2017a; Muhr, 2013), in particular Bolivia, Cuba, Ecuador, Nicaragua and Venezuela (UNEP, 2013; UNEP, 2015). ALBA is a socialist union of states who prioritise social welfare, mutual economic aid, the rights of Indigenous people, social participation and fair and equitable distribution (Muhr, 2013). Within this grouping, the alternative that Bolivia proposed for achieving sustainability and social justice was 'Living Well'/'Vivir Bien'.

Given these different overarching trajectories, South Korea and Bolivia are useful cases to compare, as each exemplifies the paradigm they follow. As well as being the earliest adopters of these models, each country was widely viewed as the key leader in their respective approach (e.g., UNEP, 2013, 2014). However, the two countries are different in several important respects. South Korea is a high-income country with a brief colonial past (colonised by Japan from 1920 to 1945) and in the post-war era was directly supported by the United States, allowed to use industrial policy and state-led development strategy, and incorporated into the core of the world-system. According to the latest data of the OEC (2020) South Korea is 37th globally in terms of GDP per capita (current US$) with top exports being mostly manufactured goods—integrated circuits, cars, refined petroleum, passenger and cargo ships, and motor vehicle parts and accessories. Bolivia is a middle-income country, firmly in the periphery of the world-system, with a long history of colonisation and neo-colonial interference by Western powers. Bolivia is 143rd globally in terms of GDP per capita (current US$) (OEC, 2020). The top exports of Bolivia are mainly raw materials—petroleum gas, gold, zinc ore, precious metal ore and soybean meal. The two countries therefore have very different starting points and, as we will discuss below, different objectives when it comes to sustainable development. Our analysis assesses their trajectories to see how changes in social and ecological indicators occur before and after the introduction of the new policies.

1.2 | Overview of Green Economy policies in South Korea

Green Economy policies were first initiated in South Korea by former president Lee Myung-bak. In 2008, he proposed that 'Low-Carbon Green Growth' (LCGG) should be the new national development paradigm for the next 60 years (NRCS, 2012). His government set up a Presidential Committee on Green Growth and launched a Low-Carbon Green Growth strategy. Though some might argue that Green Growth and Green Economy are different, most academics and NGOs (Korean and external), as well as key supra-national organisations, frame the LCGG project as Green Economy (e.g., UNEP, 2014). The Korean government at that time tended to use the terms Green Growth and Green Economy interchangeably. For example, the Korean Statistics Agency (KORSTAT) uses Green Growth Indicators (GGIs) to monitor the country's Green Economy performance (Min, 2015). UNEP showcases Korea's Green Growth projects and programmes under its Green Economy Initiative (UNEP, 2014) and, alongside the OECD, World Bank, IEA, the G8 and the G20, has lauded South Korea's Green Economy programme. For example, UNEP presented South Korea as a model green transition nation. The policies developed in South Korea under this approach included building new nuclear power stations, outsourcing food production to other nations, carbon trading and the controversial 'Four Rivers Restoration Project' which was to dredge and dam four of the countries' major rivers, More detail on the specific policies and how they relate to the SDI, which is the framework we use to assess sustainable development progress in this article, are outlined in Table A1, Appendix 1.

The Presidential Commission on Green Growth, set up by Lee in 2008, was down-graded to a ministerial committee by the subsequent Park Geun-hye Government and a number of the 'green' ministries were down-sized and re-named. However, this was less a change of direction than a rebranding intended to break the public association with some of the less popular aspects of the programme, such as the 'Four Rivers Restoration Project' (see Table A1, Appendix 1). In March 2017, following a series of protests against the Park administration, she was impeached and her government overthrown (Lee, 2017). Many South Koreans refer to this period as the 'candlelight revolution'. After Park's impeachment, Moon Jae-in was elected in 2017 as the candidate of the Democratic Party of Korea. He pursued a very different agenda, focussing on raising the national minimum wage, prioritising job creation and reducing inequality. During his first 6 months in office, Moon announced a large number of policy proposals ('100 policy tasks') that include welfare-, justice- and education- system reforms (Kalinowski et al., 2019). The Moon government focused on key environmental issues such as pollution, clean energy and transport, but did not use the rhetoric of 'Green Economy' or 'Green Growth', choosing, rather, the 'Green New Deal' model. Under the Korean constitution, presidents can only serve a single term so, in the most recent presidential elections (March 2022), Moon Jae-in was ineligible to run. Opposition candidate, Yoon Suk-yeol, of the People Power Party won the election and we do not yet know what sustainable development policies will prevail. Therefore, we are considering the Green Economy period in South Korea as lasting from 2008 to 2017.

1.3 | Overview of Living Well policies in Bolivia

During 500 years of colonial and neoliberal domination, Bolivia's economy was focussed on environmentally damaging extractive industries, especially silver, gold and tin mining, with profits going to wealthy and powerful firms and states in the Global North. In a radical break with this history, the Movement Toward Socialism (MAS) won the national elections in 2005 following protests against the

neo-liberal market reforms of the 1990s and early 2000s. These campaigns were inspired by a mixture of socialist, nationalist and Indigenous knowledge and traditions. Most remarkable was the resurgence and respect accorded to Indigenous groups that had been marginalised and oppressed for centuries (Gudynas, 2011; Fabricant, 2013).

The MAS government intended to bring about radical change as described in successive National Development Plans (MPD, 2006, 2010, 2016) and a new constitution '…based on respect and equality for all, with principles of sovereignty, dignity, complementarity, solidarity, harmony and equality in the distribution and redistribution of social goods' (Estado Plurinacional de Bolivia, 2009). These policies and documents were framed within an overall paradigm of *Vivir Bien* (Living Well). Living Well is defined by Law 300 as 'a civilizational and cultural alternative to capitalism based on the Indigenous worldview (cosmovision)' that 'signifies living in complementarity, harmony and balance with Mother Earth and societies, in equality and solidarity and eliminating inequalities and forms of domination. It is to Live Well amongst each other, Live Well with our surroundings and Live Well with ourselves' (Estado Plurinacional de Bolivia, 2012, art. 5.5). According to the new Bolivian constitution, all development projects are to be evaluated in terms of their ability to fulfil the goal of Living Well and the concept is central to the new body of legislation that has been passed since 2006. It is particularly a key component of Law 300 with its main objective to 'establish holistic development in harmony and balance with Mother Earth to Live Well…' (Estado Plurinacional de Bolivia, 2012, art. 1) (See Table A1, Appendix 1 for more information on the particular policies associated with Vivir Bien).

While there is a great deal of contention about the term Vivir Bien/Living Well (see e.g., Gudynas, 2011; Villalba, 2013), it has core elements relating to the unification of nature and society; placing humans as equal to other species; promoting participatory decision-making; and favouring solidarity and reciprocity over competition (Calisto Friant & Langmore, 2015). The Bolivian government was the first globally to take the Living Well approach in 2006, with Ecuador following closely behind, introducing '*Buen Vivir*' to their constitution in 2008. As well as controversies around definition, some have questioned the actual existence of Living Well, feeling that it is more of a government discourse than a set of Indigenous values or concrete policies (e.g. Carlos Crespo [Sociologist, University of San Simon], interview, January 9, 2017). Yet there are numerous examples of practical policies and programmes focused on, and arising from, the Living Well paradigm in Bolivia. These include the nationalisation of natural resources, new legal rights for nature, school feeding programmes, cash transfer payments to those in need, and land reforms, enabling, for example, increased forest ownership by indigenous people. See Table A1, Appendix 1 for a more detailed outline of the specific policies. Therefore, Vivir Bien aspires to living in harmony with other human beings and nature in relationships of service and reciprocity (Bell, 2016; Bell, 2017a; Bell, 2017b). It is holistic and redistributive in the sense that there is a common understanding that we cannot live well if other humans do not, or at the expense of our environment.

2 | METHODS

The research questions for this article align with the World Bank's determining evaluation questions (Gertler et al., 2016) which require that evaluating questions should be specific, measurable, attributable, realistic and targeted. The questions addressed here are:

1. To what extent did sustainable development outcomes improve following the implementation of the Living Well (LW) and Green Economy (GE) policies in Bolivia and South Korea?
2. To what extent are changes in SDI scores the result of the GE and LW paradigms and their associated policies?
3. What does this tell us about policy options other countries should adopt to achieve sustainable development?

Time-series data analysis was used as a key method for the study as it is a common and powerful way to undertake impact evaluation, particularly regarding a policy intervention, and it also reveals a change in trends (Wauchope et al., 2021). In order to answer question one, it was important to use a common benchmarking tool and to operationalise 'sustainable development'. The Sustainable Development Goals, with 17 Goals and now 359 indicators, have been criticised for being overly complex, contradictory and in some respects wedded to neoliberal interests (e.g. Pingeot, 2014; Scheyvens et al., 2016). The SDG Index is problematic in that it is a metric of "weak sustainability", which allows progress in human and capital development to compensate for ecological degradation (Hickel, 2020b). Furthermore, the SDG framework may be an inappropriate yardstick for assessing the Living Well paradigm, since the latter explicitly rejects mainstream notions of growth and development.

Given these issues, we use the SDI (Hickel, 2020a) as a benchmarking tool. The SDI framework was developed to UN's Human Development Index (HDI) for ecological impact. The SDI includes two components. First, it starts with a Development Index (DI), comprised of the three social indicators used by the HDI: the education index, the life expectancy index, and the income index (as measured by GNI per capita, PPP). Recognising that it may not be possible for very high levels of income to be compatible with sustainable levels of resource use (Hickel & Kallis, 2019), a sufficiency threshold is placed on income at a level above which additional increases are unnecessary to achieve high human development outcomes. The second component is an Environmental Impact Index (EII), which measures the extent to which CO_2 emissions per capita and material footprint per capita overshoot relevant sustainable boundaries (the boundary for emissions was 1.74 tons/cap, and the boundary for material footprint was 6.66 tons/cap, in the final year of data). These indicators account for international trade by adding the emissions and materials embodied in imports and subtracting that of exports, important in an age of globalisation where high-income countries have outsourced much of their extraction and production.

The SDI formula divides the development index (DI) by ecological overshoot (EII). When emissions and material footprint are within sustainable boundaries, the EII is 1. Overshooting the boundaries causes EII to rise above 1 on a natural exponential scale. Improvements in the

development index therefore result in direct improvements in the SDI score, until ecological pressure exceeds sustainable boundaries. After this point, increasing ecological pressure reduces the SDI relative to what it would be under conditions of zero overshoot. To succeed in terms of SDI, poorer nations must significantly improve human development while keeping their ecological pressures within or near planetary boundaries, while richer nations must maintain or improve human development while reducing their ecological pressures to sustainable levels.

Outcomes for life expectancy, education and GNI are calculated from the UNDP datasets up to 2019. Material footprint data is from the UN International Resource Panel (through 2017), and CO_2 emissions data is derived from the Global Carbon Project database (through 2018). In addition, we used the Gini index to help understand how any improvements indicated by the overall SDI outcomes may have benefitted the least well off. Gini data is from the World Income Inequality Database.

To answer the three research questions, we needed to consider causality, attribution and the extent of change. Therefore, we needed an understanding of (a) the policies implemented under each paradigm; (b) the SDI and Gini outcomes before and after the relevant policies were introduced in Bolivia and South Korea; (c) regional macro trends relevant to the SDI and Gini over the same time period; (d) global macro trends relevant to the SDI and Gini over the same time period. We therefore carried out the following research activities:

a. Document analysis of the relevant policies in Bolivia and South Korea. This process was conducted in line with recognised protocols for document analysis (e.g., Bowen, 2009). Summaries of the relevant policies are in Table A1, Appendix 1.
b. Segmented regression analyses of time series data to quantify changes in the trajectory (i.e., year-on-year change) of the SDI and Gini outcomes in Bolivia and Korea from before and after the policy paradigms—Living Well/Green Economy—were enacted. Segmented regression analysis (SRA) (Wagner et al., 2002) was used to ascertain whether there had been a change in the trajectory of the SDI indicators after the introduction of the two policy paradigms. The start point of the time series was set at 1990 and the end point was set at 2018 to give an approximately equal time before and after the interventions in both countries.
c. Visual inspection of time series data for the SDI and Gini outcomes in South America and in East Asia, over the same time period. To determine which countries should be included as comparisons, we used the UN Statistics Division definition of geographic regions (UNSD, 2021), excluding those countries with less than 1 million population size for the sake of simplicity and viable comparison. We, therefore, included the following countries: East Asia: China; China, Hong Kong Special Administrative Region; China, Macao Special Administrative Region; Democratic People's Republic of Korea; Japan; Mongolia; Republic of Korea. South America: Argentina; Bolivia (Plurinational State of); Brazil; Chile; Colombia; Ecuador; Paraguay; Peru; Uruguay; Venezuela (Bolivarian Republic of).
d. Time series analysis of the SDI and Gini outcomes of a set of countries which began with similar levels of sustainable development at the commencement of the time period. Similarity was measured by the distance from Bolivia and South Korea in two dimensions: the SDI and EII, equally weighted. The cut-off for inclusion in either group was determined by increasing the cut-off until the group average slope did not vary significantly while keeping the two groups distinct (as, at very large cut-offs, all counties would be in the same group)—see Figure 58 in the supplementary material. Group averages for these two sets of comparator countries were extracted using a multi-level modelling approach. For further information on the countries selected and the method for doing so, please refer to the supplementary information for this article.

The two policy paradigms, GE and LW, both predate the work on the SDI and so were clearly not created as a means to impact on this specific indicator. However, as Table A1 describes, the policies are nonetheless relevant to the component indicators that the SDI includes. Each policy was treated as an intervention which could have both an immediate effect and a long-term change in the trajectory of the indicator scores. The outcomes trajectories were measured before and after the year that the two policies were introduced (year end 2006 for Bolivia and year end 2008 for South Korea, that is, 0 years offset) and as a sensitivity analysis, we also looked at trajectories 1 year after the introduction of the policy (i.e., 2007 and 2009—or 1 year offset). This analysis is available in the supplementary material.

Therefore, we used these document and secondary data analyses to understand whether there was an improvement in sustainable development outcomes following the commencement of the Living Well (LW) and Green Economy (GE) policies in Bolivia and South Korea. This included comparing the two countries with others in their region, and against countries with similar SDI starting points, to ascertain whether any improvement could be attributed to the LW and GE policies. The next section outlines the findings and the supplementary data provides further information for context, transparency and verification.

Before moving on to this, though, it is important to note that Bolivia and Korea are trying to achieve different outcomes. Bolivia is a middle-income country that aims to improve social outcomes with sustainable levels of ecological pressure. Korea is a high-income country with high levels of ecological pressure that is trying to continue to grow the economy while reducing ecological pressure to sustainable levels ('green growth'). For Bolivia, success would be indicated by continued increases in SDI, ideally at a faster rate than other countries with a similar starting point. For Korea, success would be indicated by a reversal of its declining SDI trend.

3 | RESULTS

The charts below show the trajectories of each indicator for South Korea (blue) and Bolivia (orange). The observations are shown as coloured discs in Figures 1–8. The trajectories for the comparator countries are shown as dashed lines in subsequent figures. The policy intervention dates are represented as vertical lines at the start of the year, though it is understood that policies take

time to be rolled out. The regression coefficients are annotated under the legend. 'Before' represents the slope before the intervention; 'After' represents the slope after the intervention; 'Diff.' represents the change in the slope after the intervention. A positive value of 'Diff' indicates the outcome is increasing faster than before the intervention, a negative value indicates the outcome is increasing less rapidly (or decreasing more rapidly). The values of 'Diff' are quoted with a standard error of two standard deviations. The main results of this regression analysis, namely the changes in the slope of the trajectories (along with their 95% confidence intervals and p-values) are shown in Table A2 of the Appendix. The full model results can be found in Table 3 (Bolivia) and Table 4 (South Korea) in the supplementary material. Also included in Table A2 are the average trajectories slopes for the comparator countries for each outcome.

1. How have the living well and green economy policies changed the SDI trajectories of Bolivia and South Korea?

Figure 1 shows that Bolivia's SDI outcomes have continued to improve, while South Korea's have continued to degenerate, since policy implementation (LW 2006; GE 2008). This represents a continuation of previous trajectories, however, which might suggest that the policies have had no impact on the overall SDI. In both cases the significance analysis indicates that there has been no significant change (see Table A2). However, as it may become harder to achieve improvements in the SDI as it approaches its maximum value, Bolivia's steady rate of SDI increase may represent an improvement over a counterfactual no-policy scenario. A more detailed analysis is therefore required.

2. How have the LW and GE policies changed social outcomes?

The Development Index is calculated as the geometric mean of three indicators: the life expectancy index; the education index (which uses mean years of schooling and expected years of schooling); and the income index (which uses GNI per capita, PPP). Figure 2 suggests that both countries have tended to continue with previous trajectories of improvement after the policy implementation, though very slightly levelling off, more so in the case of South Korea. The significance analysis indicates that Bolivia has had no significant change in trajectory after 2006. In the case of Korea there is a statistically significant decrease in the upward slope of its trajectory, meaning the pace of the increase slows significantly after the intervention. The sensitivity analysis also backed this conclusion (see supplementary material).

If we look at individual components of the DI, it is evident that, in terms of education, income and life expectancy, Bolivia has continued to improve outcomes while South Korean outcomes have tended to level off following the change in policy, although this may be due to saturation effects whereby gains may be more difficult to achieve at higher levels than at lower levels (see Figures 3–5, respectively).

With regard to education, the education index is a composite of Mean Years of Schooling and Expected Years of Schooling. Mean Years of Schooling has a maximum value of 15 years of schooling and a minimum value of 0. Expected Years of Schooling has a maximum value of 18 years of schooling, usually equivalent to achieving a master's degree in most countries, and a minimum value of 0. Figure 3 indicates that Bolivia continues to improve its outcomes, approximately on the same trajectory as before the Living Well policy (difference—0.002). South Korea's progress slows.

On income, Figure 4 indicates that Bolivia's income improved since the introduction of the Living Well policy and that a longer-term trend for increasing incomes has taken a slightly stronger trajectory. South Korea's score on the income index has plateaued, as it reached the SDI's income sufficiency threshold in the mid-1990s. Due to this ceiling effect the regression analysis for South Korea is not statistically valid and is only included for completeness.

In relation to life expectancy, Figure 5 suggests that both countries continue to improve at similar rates, though slightly slower after the introduction of the policies. In the life expectancy index, the

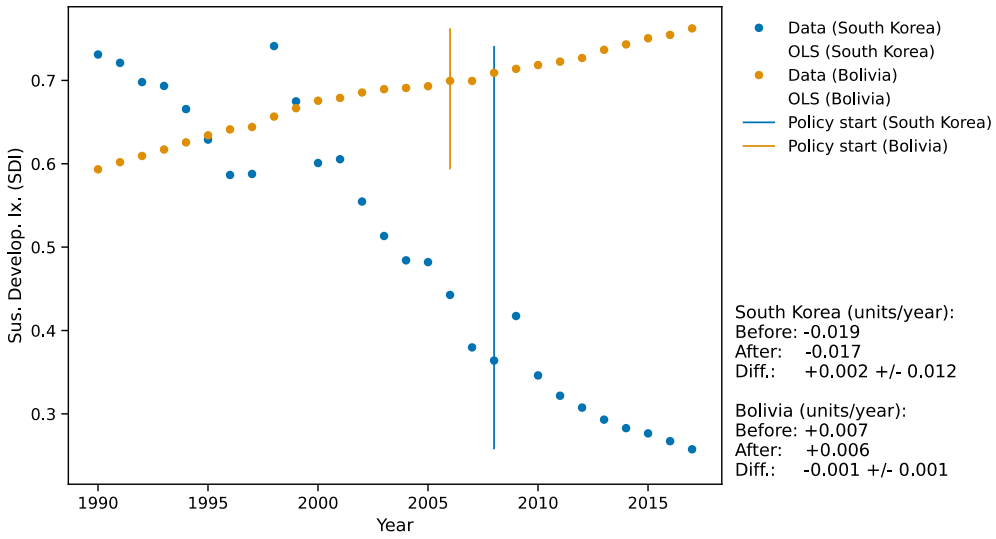

FIGURE 1 Sustainable Development Index, Bolivia and South Korea, 1990–2017. [Colour figure can be viewed at wileyonlinelibrary.com]

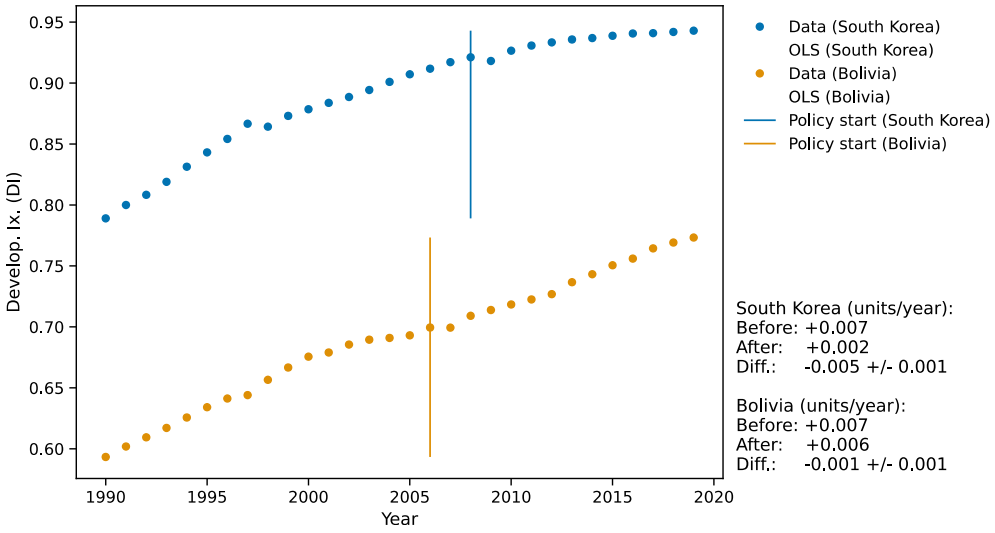

FIGURE 2 Development Index, Bolivia and South Korea, 1990–2019. [Colour figure can be viewed at wileyonlinelibrary.com]

maximum value is 85 years and the minimum value is 20 years. The result is 1 when life expectancy at birth is 85 and 0 when it is 20.

Overall, data on key social indicators would seem to suggest that the policies made little, if any difference to the general trajectory of outcomes.

3. How have the LW and GE policies changed ecological indicators?

The Ecological Impact Index measures the extent to which CO_2 emissions and material footprint overshoot sustainable boundaries (Hickel, 2020a). When emissions and material footprint are within the boundaries, the EII is 1. As emissions and material footprint exceed the boundaries, the EII rises on a natural exponential scale. Figure 6 indicates that Bolivia has kept its Ecological Impact Index at or very close to 1, following a previous trajectory, whereas Korea's overshoot has intensified since the implementation of the Green Economy policy paradigm.

Looking at CO_2 and material footprint separately, Figure 7 indicates that the trajectory of increasing CO_2 emissions in Bolivia has intensified slightly since the introduction of Living Well, although emissions remain within or near the sustainable boundary. In South Korea, the trajectory of increasing CO_2 emissions shows no evidence of either decreasing or increasing since the introduction of Green Economy, according to the regression analysis (see Table A2). South Korea's emissions are extremely high and are now more than seven times over the sustainable boundary.

Figure 8 indicates that the material footprints in both Bolivia and South Korea have increased since their respective policy paradigm changes. In Bolivia, material footprint remains very low and within the sustainable boundary. In Korea, there is no significant change of a steep upward trajectory that was occurring before the implementation of the Green Economy policy. Material footprint in Korea it is now more than four times over the boundary.

Overall, then, in the Bolivian case, according to the environmental outcomes measured, Bolivia has slightly increased its energy and resource use since the introduction of the Living Well policy paradigm, although its material footprint (5.46 tons/cap in 2019) remains within the sustainable boundary, while its CO_2 emissions (1.94 tons/cap in 2018) is only slightly above the boundary. In South Korea, after the 2008 introduction of Green Economy, both CO_2 emissions and material footprint have continued to increase and dramatically exceed the sustainable boundaries.

4. How have LW and GE policies changed inequality trajectories?

Although the SDI does not include adjustments for inequality, we add this analysis here in order to assess the distributional dynamics of LW and GE. This is particularly important given that redistribution is the key feature of Bolivia's LW policy paradigm. Living Well recognises that a fair distribution of resources is necessary to meet the needs of all within ecological limits (a position supported by a number of analysts, for example, Raworth, 2012, 2017; Wiedmann et al., 2020).

Figure 9 shows that, according to Gini data, Bolivia's levels of inequality have dropped significantly from a very high starting point, following the introduction of Living Well. This suggests that the aggregate social improvements that Bolivia has achieved, particularly in terms of increased income, have benefitted the poorest more than would have been the case without the LW policy. South Korea's inequality dropped slightly following the introduction of GE Green Economy policy but then began a statistically significant increase (see Table A2) in later years.

5. How does South Korea compare to other countries in East Asia?

Figure 10a shows that South Korea has had the greatest drop in SDI in the region from 1990. Some of the other countries went into decline, after a positive earlier trajectory, due to transgressing sustainable thresholds for emissions and resource use. The regional social comparison for East Asia, as shown in Figure 10b (Development Index), suggests that, while all countries have made improvements,

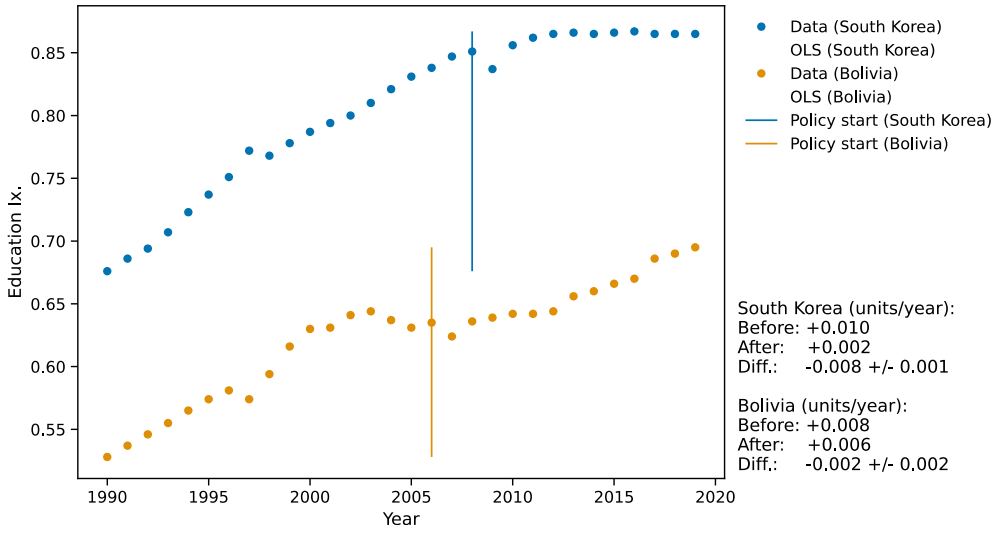

FIGURE 3 Education index, Bolivia and South Korea, 1990–2019. [Colour figure can be viewed at wileyonlinelibrary.com]

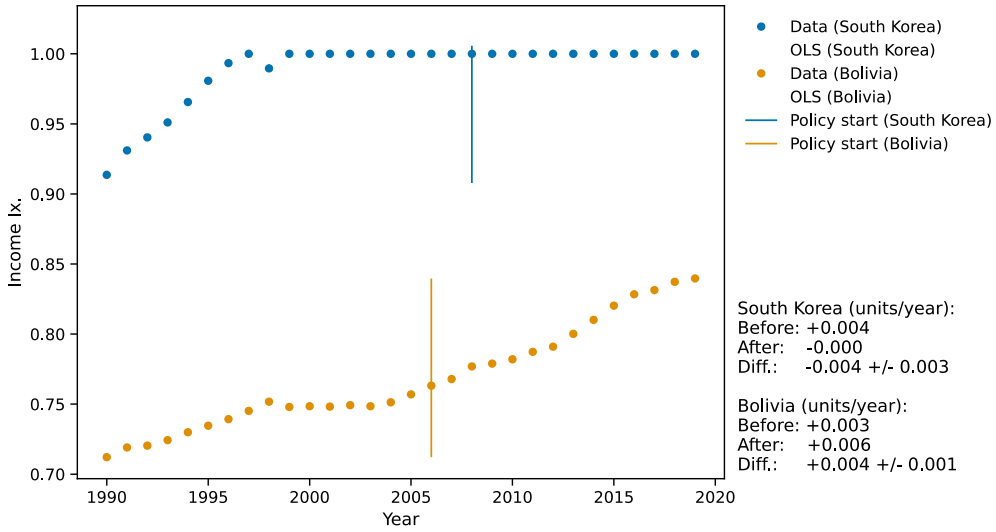

FIGURE 4 Income index, Bolivia and South Korea, 1990–2019. [Colour figure can be viewed at wileyonlinelibrary.com]

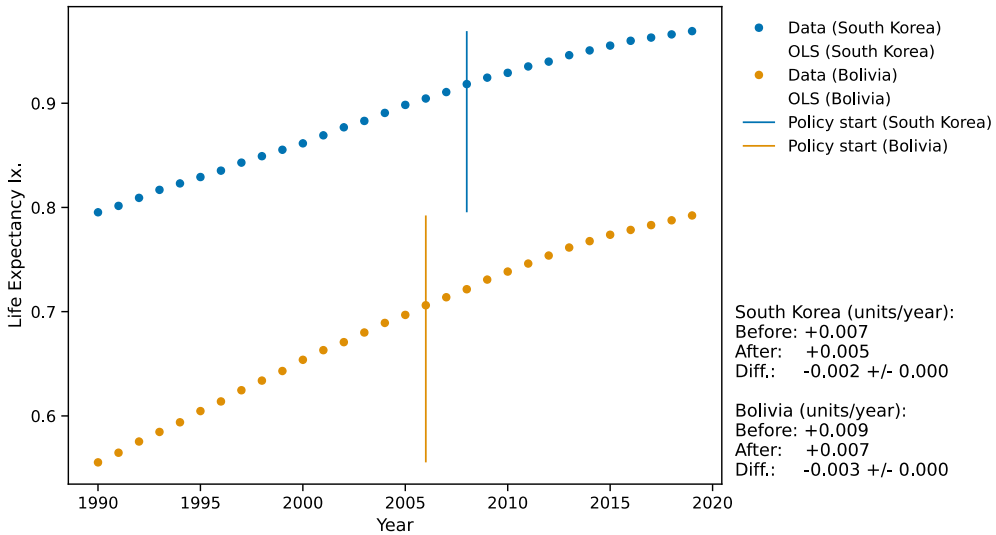

FIGURE 5 Life expectancy index, Bolivia and South Korea, 1990–2019. [Colour figure can be viewed at wileyonlinelibrary.com]

South Korea has been outperformed by China and Mongolia since the policy start, although the latter are achieving gains from lower levels. The regional ecological comparison for East Asia, as shown in Figure 10c (Ecological Impact Index), suggests that South Korea has increased environmental harm at a much faster rate than other countries in the region.

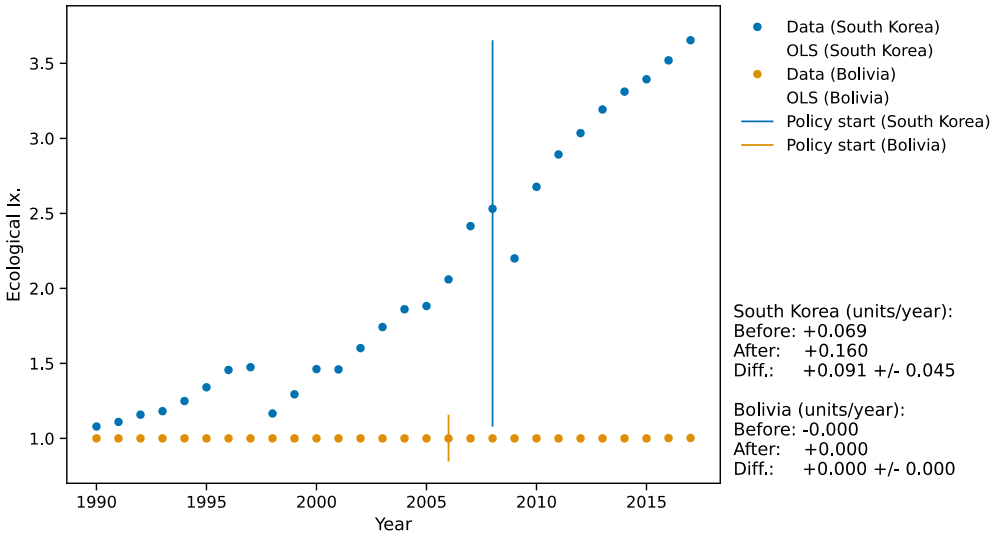

FIGURE 6 Ecological impact index, Bolivia and South Korea, 1990–2017. [Colour figure can be viewed at wileyonlinelibrary.com]

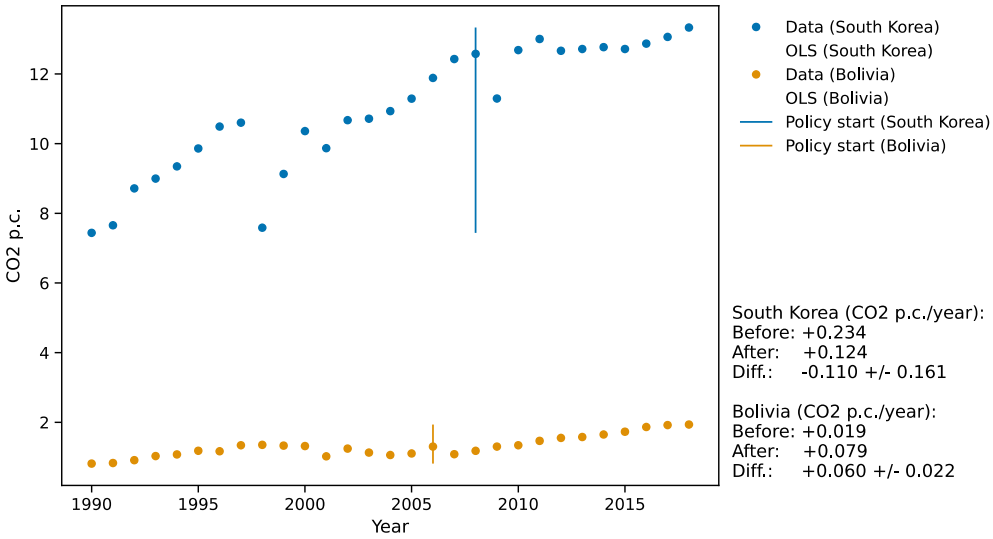

FIGURE 7 Per capita CO_2 emissions, Bolivia and South Korea, 1990–2018. [Colour figure can be viewed at wileyonlinelibrary.com]

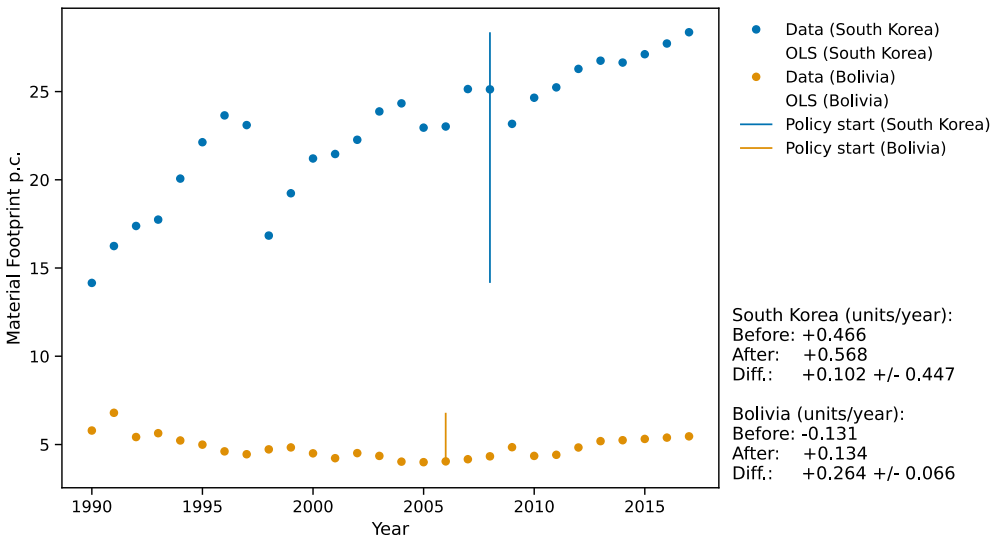

FIGURE 8 Per capital material footprint, Bolivia and South Korea, 1990–2017. [Colour figure can be viewed at wileyonlinelibrary.com]

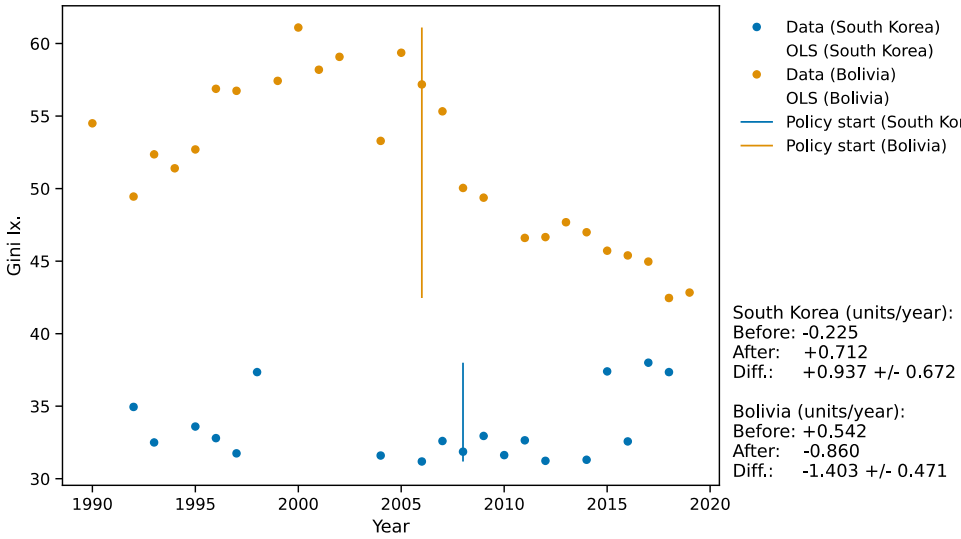

FIGURE 9 Gini index, Bolivia and South Korea, 1990–2019. [Colour figure can be viewed at wileyonlinelibrary.com]

6. How does Bolivia compare to other countries in South America?

Figure 10e shows that Bolivia, like the majority of the other South American countries, has generally been improving in terms of SDI and closing the gap from a very low starting position. However, some of the wealthier South American countries have gone into steep decline, in most cases due to transgressing sustainable levels of emissions and resource use. Figure 10f indicates that, in terms of social development, as captured by the development index, Bolivia has been catching up with other countries in the region from its low starting point. At the same time, Bolivia's emissions and material footprint have remained relatively low compared to the other South American nations, staying at or near sustainable boundaries. This is evident in the Ecological Impact Index represented in Figure 10g.

7. How do Bolivia and South Korea compare to countries in the surrounding region in terms of Gini coefficient?

If we compare the regional trajectories of inequality, we can see from Figures 10d (South Korea) and 10(h) (Bolivia) that South Korea shows an increase in inequality, similar to that of some of its regional neighbours, while others in the region managed to reduce inequality over the period. Meanwhile, Bolivia outperforms its neighbours overall on reducing inequality. It achieved a much greater comparative drop in inequality relative to other countries in the region since the introduction of the Living Well policy.

8. How do Bolivia and South Korea compare with other countries, globally, that have similar developmental starting points?

To answer this question here we focus only on the overall SDIs and the Gini. Analysis of the other indicators can be found in the supplementary material. As described in this material, the modelling approach was not valid in some cases, as some countries could not be adequately described by a linear trajectory (for instance, in the comparisons for life expectancy with Bolivia and for EII and income with South Korea).

Figure 11a shows that South Korea performs significantly worse than its comparison countries. Many of these countries experience a decline in SDI during the period, but South Korea's decline is most dramatic. South Korea falls from the middle of the group in 1990 to the bottom of the group by the end of the period. While the Green Economy policy may not have caused the problem, it did nothing to solve it. By contrast, Figure 11c shows that Bolivia has performed better than many of the comparator countries, improving its rank from 13th in the group to 6th. Most of this relative improvement occurred during the LW period.

Figure 11d shows that Bolivia's Gini falls at a much faster rate than its comparator countries after the introduction of the LW policy. By contrast, Korea actually increased inequality over the period, while many of the comparator countries reduced their Gini (see Figure 11b). This analysis, therefore, also seems to confirm that Bolivia's main success with the Living Well policy paradigm was to improve outcomes for the most disadvantaged.

4 | DISCUSSION AND CONCLUSION

With regard to the first question posed, 'To what extent did social and ecological outcomes improve following the implementation of the Living Well (LW) and Green Economy (GE) policies in Bolivia and South Korea?':

Our results show that Bolivia has continued to improve its SDI score since the implementation of the Living Well policy. Bolivia's social outcomes have continued to improve according to all three human development indicators. While emissions and material footprint have increased in Bolivia, they remain low and within or near sustainable boundaries (as of the final year of data, material footprint remains within the sustainable boundary, while emissions have only slightly exceeded the sustainable boundary). It is worth noting that

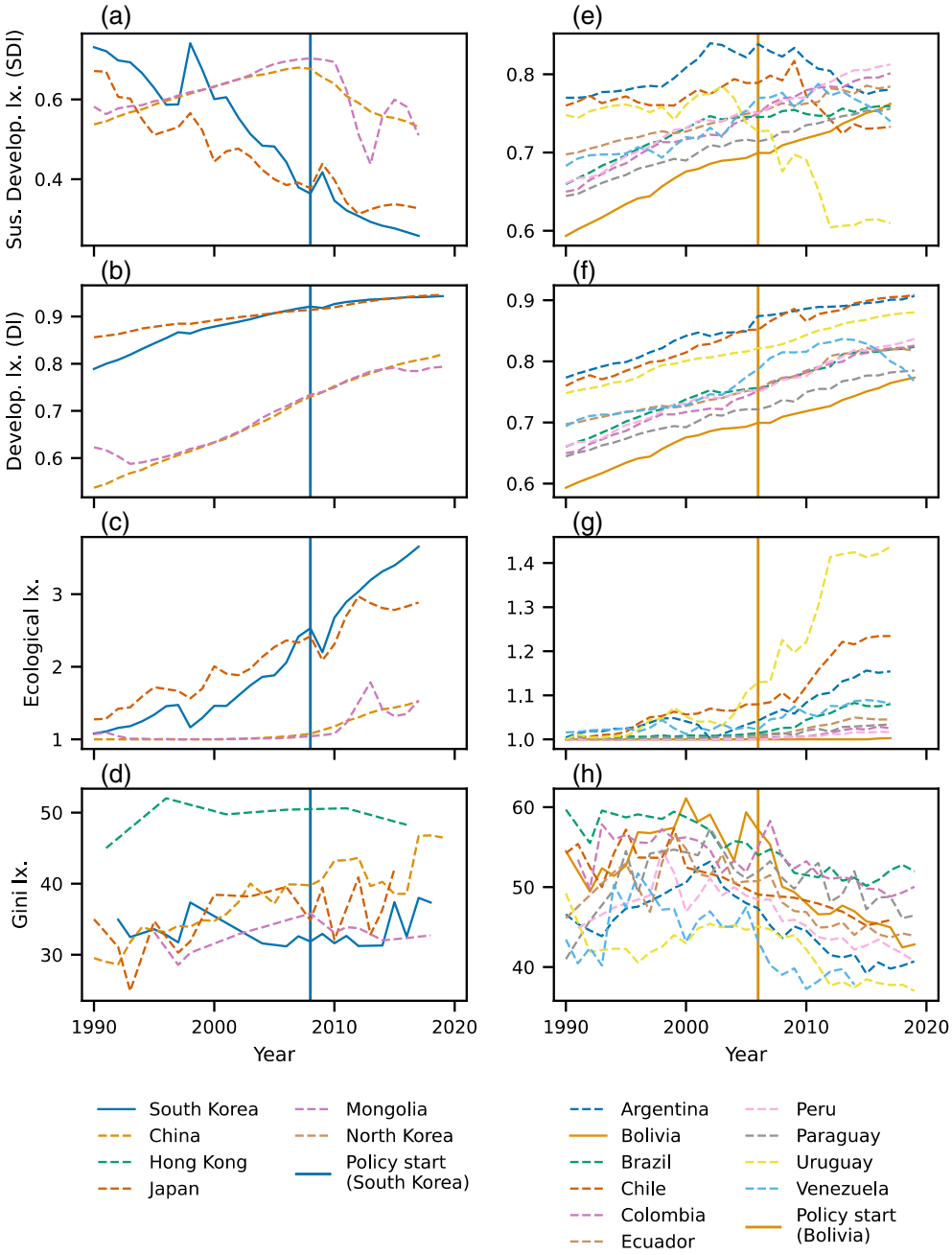

FIGURE 10 SDI, DI, EI, and Gini for South Korea (a–d, respectively) and Bolivia (e–h) with regional comparator countries. [Colour figure can be viewed at wileyonlinelibrary.com]

Bolivia's cumulative emissions remain within its fair share of the 350 ppm planetary boundary over the entire period (Hickel, 2020c). Bolivia has therefore succeeded in progressing towards sustainable development objectives. In the total set of 115 countries for which we have data, Bolivia has improved its SDI rank from 29th to 18th under the LW policy, suggesting that it has generally outperformed its peers.

By contrast, Korea has failed to progress towards sustainable development objectives: In fact, it has *regressed*. Social indicators have continued to improve, but the Green Economy policy has failed to reduce ecological pressures according to the two core indicators assessed here. Both CO_2 emissions and material footprint have continued to increase since the GE policy start. Korea's overshoot of the sustainable boundaries has worsened. In the final year of data, South Korea's material footprint was 28.36 tons/cap (more than four times over the boundary), and CO_2 emissions were 13.33 tons/cap (more than seven times over the boundary). Korea's SDI has continued to decline, and its SDI rank has fallen from 85th to 104th under the GE policy, making it one of the worst performers in the world.

From visual inspection of the relevant graphs, it is clear that social outcomes have improved at a faster rate in Bolivia than in South Korea, although this may be due to the latter approaching ceilings. The major difference between the two is that in Bolivia inequality has decreased while in South Korea it has increased. Bolivia's reduction of inequality is perhaps the most remarkable achievement following the introduction of the Living Well policy. It is particularly outstanding in

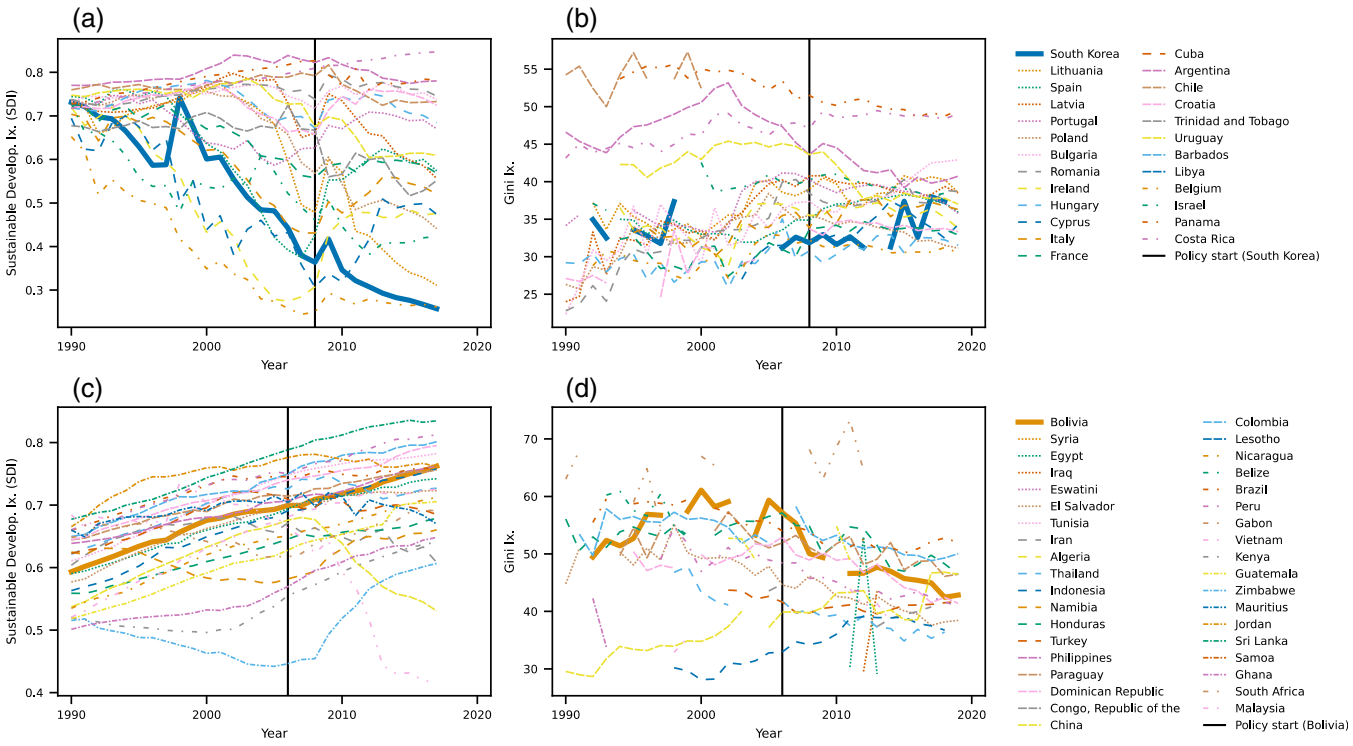

FIGURE 11 SDI and Gini coefficient in South Korea (a, b, respectively) and Bolivia (c, d) with their respective comparator countries. [Colour figure can be viewed at wileyonlinelibrary.com]

that it is the strongest apparent drop in inequality in South America over the time period. This indicates that social improvements in Bolivia have benefitted those who most needed it.

In relation to the second question 'To what extent are the changes that occur with regard to the SDI in each country the result of the GE and LW paradigms and their associated policies?':

It is clear that GE in Korea did not improve ecological outcomes. Indeed, Korea's ecological performance has been worse than others in the region, and worse than countries with comparable SDI starting points. In Bolivia social outcomes improved, while ecological pressure has remained within or near sustainable boundaries, but it is difficult to say whether this is a result of the LW policy or a continuation of previous trends. It is notable however that Bolivia seems to have outperformed several countries with comparable SDI starting points, and seems to have achieved faster social improvements than several other countries in the region. This suggests that the LW policy has been more successful than a counterfactual no-policy scenario.

Finally, with regard to the third question that we set out to answer 'What does this tell us about policy options other countries should adopt to achieve sustainable development?':

It appears that the redistributive model, Living Well, has in Bolivia been able to achieve targeted improvements in education, income and life expectancy for the most disadvantaged, without high CO_2 emissions or high material footprint. While it might be argued that Bolivia performs well ecologically simply because it has lower levels of production, it has also introduced several strong ecological policies, including reforestation, community-oriented production, increased use of renewable energy, and recuperation of traditional sustainable housing and agriculture, which we might expect would also enhance ecological performance, as outlined in Table A1. Meanwhile, the market model, Green Economy, has in South Korea continued to increase CO_2 emissions and material footprint well beyond sustainable boundaries. The introduction of GE has done nothing to reverse this trajectory.

It is important to note that there are several features of Bolivia's Living Well Policy that cannot be captured by the data used in the SDI. For example, the Education Index is based on years of schooling, yet Bolivia's Living Well improvements in education are in relation to who goes to school and the quality of that education, rather than a change in the years of schooling. The changes to outcomes are quite remarkable. Illiteracy, which stood at approximately 14% in 2006, was eradicated by 2009 (UNESCO, 2009) and the primary school drop-out rate, at 25.6% in 2000, the closest date with data to before the introduction of Living Well, had dropped to less than 3.3% within a decade (UNICEF, 2017). The Bolivian education reform act of 2010 radically transformed education towards the 'Critical Pedagogy' approach of Paulo Freire (1970) and retraining teachers and revising the curriculum according to four general principles or objectives: (1) decolonial, (2) intra- and intercultural (3) productive and (4) communitarian (Bell, 2017b; Reimão & Taş, 2017; Schipper, 2014)—see Table A1 for an outline of the relevant Living Well policy that brought these changes about. Therefore, our method of analysis does not fully capture the qualitative changes that have taken place since in Bolivia since the introduction of LW.

There are also several other issues which may have limited the findings including: (1) *The breakpoint for measuring the policy implementation*—For simplicity, we have looked at trajectories from the commencement of the policy though implementation. Yet outcomes take time to be enacted and for consequences to become apparent. For example, in 2019, Bolivia inaugurated a new free universal health care system (SUS) for those who cannot afford health insurance. The results of this are not yet captured in the data; (2) *the timescales*—both Korea and Bolivia had a radical change of direction (which was temporary in the case of Bolivia), following the 2017 candlelight revolution in the former and the 2019 coup in the latter, so the timescale has necessarily been short; (3) *the different starting points and contexts* of the two countries—we have tried to take this into account by including regional and global analysis but it remains an analytical tension that these countries are difficult to compare.

While more research is needed to investigate the ecological and social outcomes of different policy approaches over time, our work suggests that the Green Economy model has little efficacy as a strategy for sustainable development. Conversely, the Living Well model may offer lessons that other countries can draw on towards realising a safe and just operating space for humanity.

It might be argued that GE and LW should engage with each other to bring out the best strategy for sustainable development going forward. França et al. (2022), also discussing two distinct environmental policy packages, concluded that the different approaches analysed could be brought into dialogue. To some extent, this depends on the definition of GE. As some have emphasised, Green Economy is complex, difficult to operationalise and constantly evolving (e.g., Loiseau et al., 2016). There are a spectrum of definitions of GE from those which focus more on economic elements to those that focus more on the social (Allen & Clouth, 2012). For example, the UN (2023, np) has recently discussed the Green Economy as '…a resilient economy that provides a better quality of life for all within the ecological limits of the planet…'. Some supporters of GE have argued for bringing ecological goals into governance (e.g., Fiorino, 2018) and the necessity of governments that can set standards and regulate (e.g., Droste et al., 2016). However, the dominant understanding of Green Economy, which was used in South Korea during the period studied, is fundamentally opposed to Living Well, particularly over the issues of growth, inequality, the role of the state, the primacy of technical solutions and the incremental approach, and in this sense constitutes a completely different path. Though some policies, such as the circular economy and dematerialisation, would fit with both, as paradigms they are based on different values and world views.

The difference in these overarching policy frameworks is evident from the policies that they encompass (see Table A1, Appendix 1). For example, while Bolivia was eradicating illiteracy, focussing on the most marginalised, South Korea was subsidising elite schools. While Bolivia was reforesting, South Korea was looking to nuclear power and emissions trading to mitigate climate change. And while Bolivia brought in cash transfer and other social programmes to benefit those on low incomes, South Korea had no mention of redistribution in its Low Carbon Green Growth Strategy. Importantly, while growth was not a goal of the LW approach, growth did occur in Bolivia and benefitted the least well off. Growth was clearly a goal in South Korea and unhelpful programmes were put in place to further it, such as the Four River Restoration Project. The core difference between these two pathways is that LW has focused on 'needs', as required from the Brundtland definition of sustainable development, whereas GE has focused on economic interests.

LW has had its critics from within and beyond the country. For example, Ranta (2017) largely dismissed the Living Well policy paradigm in Bolivia as an ideal that was being implemented in an unpopular, authoritarian way by the MAS. These claims have not stood up to scrutiny, however. Since that article was published, a coup removed the MAS party from power. Yet, as soon as democratic elections occurred, MAS were voted back into power with a large majority. This gave MAS one of the largest mandates in Bolivian history and a major endorsement of its policies enabling the Living Well policy framework to continue (Dangl et al., 2021).

Overall, our analysis indicates that pursuing economic growth for its own sake may not be necessary or even helpful for achieving sustainable development. Living Well deserves more attention as a potential solution to the multiple social, economic and environmental solutions that many countries now face.

AUTHOR CONTRIBUTIONS

Karen Bell: Conceptualization; formal analysis; funding acquisition; investigation; methodology; project administration; writing-original draft; writing-review & editing. **Jason Hickel**: Conceptualization; methodology; writing-original draft; writing-review & editing. **Rob Arbon**: Data curation; formal analysis; methodology; software; visualisation; writing-review and editing. **Huzaifa Zoomkawala**: Data curation.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX 1

TABLE A1 Living Well and Green Economy policies in Bolivia and South Korea and links to SDIs.

SDI	Living well policy in Bolivia	Green economy policy in S. Korea
Life expectancy	Health has been a key focus of the MAS government and one of the main pillars of the Bolivian National Development Plan for Living Well. A new national health policy, initiated in 2008, *Salud Familiar Comunitaria Intercultural*—SAFCI, based on principles of equality, access, and respect for indigenous principles, based on *Vivir Bien*—Living Well (SAFCI in Bernstein, 2017). Linked to this, the eradication of hunger is one of the principal objectives of all the Bolivian National Development Plans. In addition to the measures to reduce poverty, enabling families to buy more and better-quality food, there have been specific policies to improve nutrition (Dávalos Saravia, 2013). The government aims for Bolivia to be fully self-sufficient in food by 2020 through enhancing production capacity via programmes such as Bio-Cultura (Weyer, 2017). Universal access to safe water and sanitation systems are also a key part of the National Development Plans for Living Well. The new Estado Plurinacional de Bolivia (2009) states that every citizen has a right to water (Ch. 1, art. 16). 'MiAgua', a water investment programme was launched (Baer, 2015). There has been an expansion of sewerage systems and construction of ecological toilets.	Life expectancy in South Korea has tended to increase in line with the expansion of medical insurance. In 2000, medical insurance was introduced and has since been integrated into the South Korean National Health Insurance (NHI) with high coverage rates. The NHI covered 97% of the population in 2015 (Kwon, 2019). The main Green Economy policy that can be related to health was the policy to improve water supplies and reduce the impacts of climate change. Part of the Low Carbon Green Growth Strategy, the controversial 'Four Rivers Restoration Project' was proposed to dredge, dam and 'beautify' four major rivers, supposedly to increase the supply and quality of fresh water and prevent flooding and drought as an adaptation to climate change. The project accounted for 36.8% of the budget for the government's Green Economy program, the highest share (Yun, 2010). Although more than 70% of Korean citizens criticised the project on the grounds that it would kill the ecosystems of the four rivers, the project proceeded without respect for legal process (Yun, 2010).
Education	The 'Yes I Can' literacy programme and the stipend the government now provides for children who stay in primary school (Bono Juancito Pinto), are both policies of the National Development Plans for Living Well. The Bolivian education reform act of 2010 is also radically transforming education to be (1) decolonial, (2) intra- and inter-cultural along with plurilingual, (3) productive and (4) communitarian (see Schipper, 2014). There has also been an expansion and improvement of the educational infrastructure (MPD, 2016, p. 22). In addition, the 'National Programme on Complementary School Feeding to Implement Food Sovereignty and Living Well' aims to provide healthy, adequate and culturally appropriate food so as to reduce hunger, increase school attendance rates and enhance school performance. It entitles all school children to a breakfast and/or lunch (Estado Plurinacional de Bolivia, 2015).	Green Economy policy was not strongly linked to education. However, the president that implemented Green Economy, Lee Myung Bak, set out to liberalise the education system such that it would run according to the free will and efforts of individuals and market forces, governed by 'invisible hands', rather than government regulations (Goggin, 2009; KTU, 2008). This included permitting students to give donations in order to be permitted to desired universities; abolishing some of the education authority's interventions; and setting up 300 government-subsidised elite schools. There were, however, some South Korean public environmental education programmes introduced, focused on stimulating demand for green products and encouraging individual green behaviour patterns (see GGGI, 2011).
Income	The eradication of poverty is also a key goal in the Bolivian National Development Plans for Living Well (MPD, 2006, 2010, 2016). Annual increases in the national minimum wage of between 5% and 20% have been introduced each year. Redistribution of wealth has occurred through land reform, though the Bolivian oligarchy have prevented further reform (Simarro & Antolín, 2012). The main programmes for reducing poverty and inequality have been transfer payments, including an annual stipend for children who stay in primary school (*Bono Juancito Pinto*), a national pension and social security scheme (*Renta Dignidad*), a health	During the Green Economy era welfare provision in South Korea was expanding, consistent with the previous decade (Ringen et al., 2011). However, social insurance programs, including pensions and social security after employment loss, still covered less than half of the population in the relevant categories (Kwon, 2014). Social spending stood at 8.1% of GDP. This is low by international standards, with the average OECD spending being 19.8% of GDP (Joung-Woo et al., 2012; 2011 data). The conservative Lee Myung Bak government was against increases to public welfare so that by 2013, it was noted 'Despite coverage expansion and growth in social expenditures, the deep-rooted features of the ancient

(Continues)

TABLE A1 (Continued)

SDI	Living well policy in Bolivia	Green economy policy in S. Korea
	insurance programme for under-25 s, payments for women who are pregnant or have young children (*Bono Juana Azurduy*) (Simarro & Antolín, 2012).	regime remain almost the same: a social insurance-dominated system, underdeveloped tax-based social services, weak citizenship-based social rights, low benefits, large loopholes in coverage, a high degree of dualism, and resultant weak decommodification and scanty redistributive effects' (Yang, 2013: 471).
Per capita CO_2 emissions	Electrification, energy sovereignty and independence were defined as priorities in the National Development Plans for Living Well. The 2009 Constitution established universal access to electricity as a fundamental right. In 2008, the 'National Energy Efficiency Programme' was initiated, establishing 'policies, projects and necessary actions for the rational, efficient and effective use of energy' (MPD, 2016, p. 20) with a goal to reduce Greenhouse Gas emissions. Bolivia has extended access to renewable energy, photovoltaic systems, wind turbines and local energy storage (Godoy, 2017). The National Development Plan for Living Well states that there should be 'access to dignified housing with basic services'. Traditional housing construction technologies of indigenous people are to be supported (MPD, 2016, p. 83). Low emission transport infrastructure systems have been built in La Paz and El Alto and are planned for Oruro, Potosí and Sucre. The Plurinational Authority of Mother Earth (art. 53) was set up which now focuses primarily on mitigating climate change. Globally, Bolivia has advocated climate reparations from the Global North to the South, and called for a 1°C maximum limit on temperature increases. Forest ownership for indigenous people has increased from 3 million hectares to more than 7 million (MPD, 2016, p. 37). Where Bolivia formerly had one of the highest deforestation rates in the world (UN-REDD, 2010), this dropped dramatically—by 64% between 2010 and 2014 (Andersen, 2014). Fuentes (2015) points out that 2010 is the year the government set up a state body to protect forest areas under the Living Well paradigm. The 'Framework Law of Mother Earth and Integral Development for Living Well' establishes 11 new rights for nature.	In 2009 the South Korean government set a greenhouse gas reduction target of 30% by 2020, the most ambitious target of the Non-Annex I countries to date. A Target Management System (TMS) was initiated, setting emissions targets for 470 participating companies. The government provided financial assistance to the targeted companies, subsidising up to 50% of their costs for installing energy-efficient and low-carbon facilities. The TMS became the precursor for an Emissions Trading Scheme (ETS), adopted in 2012, making it one of the first governments in the world to set up an ETS (IEA, 2012). The South Korean carbon market is now the world's second largest, after the European Union ETS (EU ETS). Renewables were also to be developed (Kang et al., 2012) but this included up to 50% of the energy mix being made up of nuclear power (Sanders, 2010). Hence, 12 additional nuclear power plants would need to be built (Sanders, 2010). The Government's LCGG strategy also included the deregulation of factory sites and the lifting of some greenbelt restrictions, including previously prohibited building on mountainsides. Under the Green Economy paradigm, the Korean government emphasised agricultural outsourcing. This included, for example, the Daewoo Logistics–Madagascar deal of 2008 where half of Madagascar's arable land and some rainforests, were to be converted into monocultures for South Korean food and energy. This 'land grab' attracted particular attention because of its size (1.3 million hectares) and the consequent riots and overthrow of the Madagascan government.
Per capita material footprint	In the National Development Plans for Living Well, there is a strong emphasis on inclusive infrastructure and industrialisation such as the 2014 launch of Bolivia's first telecommunications satellite, creating greater connectivity for citizen. Though referred to in the National Development Plans for Living Well, neither GDP nor growth represent a specific goal. Though growth is not a goal, it has occurred as a result of increased domestic consumption enabled by better wages and benefits and increased public investment (MPD, 2016, p. 47). In addition, some natural resources have been nationalised which enabled the government to use these resources to finance social projects. The tax and royalties gained by the state increased from an average 18% of profits to as much as 82% (Postero, 2010). At the same time, the National Development Plan seeks to	A key ambition of the Green Economy policy in Korea was to achieve economic growth while reducing the energy and resources used. In 2010, the government collaborated in setting up the Global Green Growth Institute (GGGI) for the purposes of diffusing green growth around the world (GGGI, 2013). The underlying assumption is that economic growth and environmental sustainability are compatible (GGGI, 2013, p. 1). New growth in South Korea was to be achieved through research and development in green technologies. The Green Economy approach in South Korea was supported by billions of dollars of public finance. Financial incentives were available photovoltaic panels, wind energy technology and Light Emitting Diode (LED) appliances; fuel cells; carbon capture and storage (CCS); nuclear reactors; green cars; bio-technology; robot applications; nano-fusion; and bio-pharmaceuticals

TABLE A1 (Continued)

SDI	Living well policy in Bolivia	Green economy policy in S. Korea
	promote 'The construction of a less consumerist and less individualistic society' (MPD, 2016, p. 65). Local crops are being promoted and Municipal Committees of Ecological Production have been set up. Extractive production is intended to be a time limited means to generate income while actions to diversify the economy are taking effect which go '…beyond the exploitation and processing of natural resources' (MPD, 2016, p. 100).	(Ministry of Knowledge Economy, 2009; National Science and Technology Council, 2009; Presidential Council for Future and Vision, 2009). The government introduced a mandatory eco-friendly product procurement scheme for public institutions and provided incentives and information, to encourage citizens to buy ecological products. Commercial banks were encouraged to give preferential rates to customers who purchase eco-products with a specific credit card linked to their account (Kang et al., 2012).
Inequality	Reducing inequality and discrimination are key goals in the National Development Plans for Living Well. The relevant policies and programmes have included the cash transfer payments—40.6% of the population benefitted from at least one of these payments in 2014 and year on year increases in the minimum wage from 2006 (MPD, 2016). Law 045, 'Against Racism and All Forms of Discrimination', was passed in 2010, prohibiting discrimination and barring the dissemination of racist and discriminatory ideas through the mass media. The 2008, National Plan for Equal Opportunities entitled 'Women Building the New Bolivia, to Live Well (*Vivir Bien*)' was launched (Ministerio de Justicia, 2008). Women's representation in parliament leapt from 16.9% in 2005 to 53.1% by 2016 (World Bank, 2017).	Under the Green Economy policy paradigm, reducing inequality was primarily to be achieved through economic growth so that more people could be employed and benefit from the wealth of the nation. There was no element of redistribution included in the Low-Carbon Green Growth Strategy. The OECD has made a statement regarding the need for Korea to look beyond growth in its policies, stating: 'While economic growth can help reduce income inequality and poverty, Korea's experience shows that achieving a high growth rate is not sufficient in itself to address inequality and poverty' (OECD 2012, p. 1). South Korea's income inequality, as measured by the Gini Coefficient, worsened from 1998 after structural reforms were implemented following the Asian economic crisis. Discontent about rising inequality, was reportedly increasing among the population during the Green Economy period, accompanied by growing disenchantment with the government (Lee et al., 2012)

Note: This table is adapted and updated from material previously published in Bell (2017a, 2017b) and Bell (2016).

TABLE A2 Change in the slope and group average slope of the trajectory for all outcomes, assuming the policy comes into effect in the policy year.

Country	Outcome	Variable	Value	95% C.I.	*p*-Value	Sig. at 5%
Bolivia	CO2_pc_GCP	Change in slope	0.060	(+0.036, +0.083)	<0.001	Yes
Bolivia	CO2_pc_GCP	Group average slope	0.0488	(+0.029, +0.072)	<0.001	Yes
Bolivia	DI	Change in slope	−0.001	(−0.001, +0.000)	0.084	No
Bolivia	DI	Group average slope	0.0054	(+0.005, +0.006)	<0.001	Yes
Bolivia	Eco_index	Change in slope	0.000	(+0.000, +0.000)	<0.001	Yes
Bolivia	Eco_index	Group average slope	0.0039	(+0.001, +0.007)	0.011	Yes
Bolivia	Edu_index	Change in slope	−0.002	(−0.004, −0.000)	0.028	Yes
Bolivia	Edu_index	Group average slope	0.0072	(+0.006, +0.008)	<0.001	Yes
Bolivia	Inc_index	Change in slope	0.004	(+0.003, +0.005)	<0.001	Yes
Bolivia	Inc_index	Group average slope	0.0042	(+0.003, +0.005)	<0.001	Yes
Bolivia	Life_exp_index	Change in slope	−0.003	(−0.003, −0.002)	<0.001	Yes
Bolivia	Life_exp_index	Group average slope	0.0036	(+0.003, +0.004)	<0.001	Yes
Bolivia	Mat_footprint_pc	Change in slope	0.264	(+0.195, +0.333)	<0.001	Yes
Bolivia	Mat_footprint_pc	Group average slope	0.0972	(+0.042, +0.156)	<0.001	Yes
Bolivia	SDI	Change in slope	−0.001	(−0.002, +0.000)	0.100	No
Bolivia	SDI	Group average slope	0.0038	(+0.003, +0.005)	<0.001	Yes
Bolivia	Gini	Change in slope	−1.403	(−1.901, −0.905)	<0.001	Yes
Bolivia	Gini	Group average slope	−0.1914	(−0.321, −0.076)	1.000	No
South Korea	CO2_pc_GCP	Change in slope	−0.11	(−0.279, +0.059)	0.192	No
South Korea	CO2_pc_GCP	Group average slope	0.0157	(−0.038, +0.072)	0.562	No
South Korea	DI	Change in slope	−0.005	(−0.006, −0.004)	<0.001	Yes
South Korea	DI	Group average slope	0.0046	(+0.004, +0.005)	<0.001	Yes
South Korea	Eco_index	Change in slope	0.091	(+0.044, +0.139)	<0.001	Yes
South Korea	Eco_index	Group average slope	0.0245	(+0.014, +0.034)	<0.001	Yes
South Korea	Edu_index	Change in slope	−0.008	(−0.010, −0.007)	<0.001	Yes
South Korea	Edu_index	Group average slope	0.0072	(+0.006, +0.008)	<0.001	Yes
South Korea	Inc_index	Change in slope	−0.004	(−0.007, −0.001)	0.007	Yes
South Korea	Inc_index	Group average slope	0.0025	(+0.001, +0.003)	<0.001	Yes
South Korea	Life_exp_index	Change in slope	−0.002	(−0.002, −0.002)	<0.001	Yes
South Korea	Life_exp_index	Group average slope	0.0033	(+0.003, +0.004)	<0.001	Yes
South Korea	Mat_footprint_pc	Change in slope	0.102	(−0.369, +0.573)	0.659	No
South Korea	Mat_footprint_pc	Group average slope	0.2483	(+0.110, +0.415)	0.001	Yes
South Korea	SDI	Change in slope	0.002	(−0.010, +0.015)	0.722	No
South Korea	SDI	Group average slope	−0.0052	(−0.008, −0.003)	1.000	No
South Korea	Gini	Change in slope	0.9370	(+0.207, +1.667)	0.015	No
South Korea	Gini	Group average slope	0.0972	(−0.018, +0.228)	0.101	No