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# 1 Policy planning to achieve sustainable development goals 2 for low-income nations

## 3 **Abstract:**

4 Methodical planning for formulating sustainability policy is needed to meet the ambitious  
5 United Nations Sustainable Development Goals (SDGs). This paper proposes an  
6 approach for such planning for low-income nations by systematically dividing the  
7 principal sustainability policy into manageable policy categories. These categories  
8 encompass all 17 SDGs, enabling policymakers to take into account the complex  
9 interlinkages of the SDGs for sustainability planning. Key actions that need to be taken in  
10 each policy category to enhance sustainability are then identified. In order to ensure that  
11 the planning process is holistic, analysis of the interlinkages of SDGs is carried out based  
12 on prioritisation of the relative importance of each Goal. Although the priority of each  
13 Goal can be country specific, interlinkages among Goals 1, 7 and 9 are analysed as an  
14 example to illustrate the proposed approach. Top-down approach of the UN's global  
15 sustainability agenda is integrated with a bottom-up approach of empowering and  
16 promoting local knowledge of low-income nations to develop the planning and policy  
17 approach presented in this paper. Finally, research gaps are highlighted to support the  
18 achievement of sustainability targets and further enhance the benefits of academic  
19 research to low-income nations.

## 20 **Keywords:**

21 United Nations; Sustainable Development Goals; Policy planning; Low income nations;  
22 Poverty eradication; Governance

## 23 **1 Introduction**

24 The United Nations (UN) has declared 17 Sustainable Development Goals (SDGs)  
25 and 169 targets aimed to be met by 2030 (United Nations, 2015). It has recognized that  
26 sustainable development cannot be realized without the ending of global poverty and has  
27 stated that special attention should be given to low-income nations (United Nations,  
28 2015). Here the term 'low-income' used is as per the UN classification of nations (United  
29 Nations, 2018). Several approaches for sustainable development have been proposed  
30 (Broman et al., 2017; Loorbach, 2010; Jabareen, 2008; Robert, 2010) for the world in  
31 general, but there is a need to develop approaches to achieve sustainable development  
32 that are exclusively focused on low-income nations as their priorities on socio-economic  
33 and infrastructure development policies are different than the developed nations or  
34 emerging economies. This is of great importance because although the global average of  
35

36 extreme poverty has been declining over the past few decades (DESA, 2020), the number  
37 of people living in extreme poverty in Sub-Saharan Africa has remained fairly constant  
38 (Beltekian and Ortiz-Ospina, 2018) and the statistics of decline in the global average of  
39 extreme poverty is mainly due to the falling of extreme poverty in China (Weiping, 2018)  
40 and India. Furthermore, strategies required for achieving SDGs can be radically different  
41 for high-income, middle-income and low-income nations. High-income nations require  
42 strategies for carbon footprint reduction whilst maintaining quality of life and social  
43 equity. For the middle-income nations, the strategy for sustainable development is mainly  
44 focused on maximising energy efficiencies through innovative technologies and  
45 processes and improve quality of life through social equity, infrastructure, health and  
46 comfort. For low-income nations, sustainability is driven by requirements such as  
47 elimination of poverty, job creation, training of unskilled workforce, providing safe  
48 shelter and drinking water amongst other issues. The main factors that could either enable  
49 or cripple sustainable development in low-income nations have been identified as  
50 complex interactions among poverty, climate change, rapid urbanisation and food  
51 insecurity (Cobbinah et al., 2015).

52 It has been argued that sustainable development and green growth discourses do not  
53 fit the crucial socioeconomic needs of low-income nations (Arif, 2015). This argument is  
54 based on the idea that low-income nations cannot afford to implement the policies of  
55 sustainable development and green growth because the majority of their citizens live  
56 under the poverty line. Similarly, unplanned urbanization and poverty have been reported  
57 to be major threats to sustainable development for low-income nations (Cobbinah, 2015).

58 This paper proposes a systematic approach to formulate and implement robust  
59 sustainability policies solely focused on low-income nations in order to achieve the  
60 SDGs. Firstly, the methodology is described (Section 2) and then the overarching  
61 sustainability policy is divided into manageable policy categories and the key actions  
62 needed to implement each policy category are suggested (Section 3). Given the pressing  
63 need to reconcile sustainable development with poverty alleviation and economic growth  
64 in low-income nations, a proposition that the SDGs be ranked based on their relative  
65 importance is then made (Section 4). To further refine the policy planning, analysis of  
66 interlinkages among three SDGs is carried out by choosing Goals 1 (ending extreme  
67 poverty), 7 (ensuring access to sustainable energy), and 9 (building sustainable  
68 infrastructure and industries) as illustrative examples (Section 5). Then, main research  
69 gaps that need to be addressed to achieve SDGs for low-income nations are highlighted to  
70 promote and stimulate academic research in the field (Section 6) and finally conclusions  
71 are drawn in Section 7.

72 The main original contribution of this paper is that it provides an easy-to-use planning  
73 approach that can be utilised by low-income nations to plan for sustainability without

74 requiring extensive sophisticated resources unavailable to them. Additionally, research  
75 directions are set out to maximise the benefits of academic research to low-income  
76 nations. This paper aims to bridge the gap between academic research and its utilisation  
77 in low-income nations. Therefore, the identified research directions, and evidences and  
78 rationale for the approach presented here are based on intense consultations among  
79 academics, personnel involved in development sector and citizens of the low-income  
80 nations, in addition to literature review.

## 81 **2 Methodology**

82 The planning approach developed in this paper is based on formal and informal -  
83 group discussions with professionals, literature review and the experiences of the authors.  
84 The group discussions on sustainability policy planning for low-income nations were  
85 initiated at the 5<sup>th</sup> conference organised by the Society of Nepalese Engineers, UK in  
86 2019 and continued throughout 2020 (formal and informal discussions are continuing).  
87 Discussions and consultations were held with professionals in the development sector,  
88 government officials and academics with the aim of systematizing sustainability planning  
89 process. The findings of the discussions were then compiled and supplemented with  
90 literature review. Google Scholar and Web of Science were the primary searching tools  
91 utilised to conduct literature review by using keywords such as “Sustainable development  
92 goals”, “sustainability planning for developing countries”, “low-income nations policy  
93 planning” and “sustainability policy framework for poor nations”. The methodology was  
94 also guided by the authors’ experiences of working in the development sector of Nepal  
95 (one of the least developed nations) and an aim of making the findings of academic  
96 research more accessible to low-income nations. Therefore, the methodology attempts to  
97 enhance the interaction between research and practical implementation (Zeigermann &  
98 Böcher, 2020; Böcher & Krott) to maximise overall benefits.

## 99 **3 Classification of principal sustainability policy**

100 This paper proposes a novel classification of overarching or principal sustainability  
101 policy by recognising that sustainability consists of multiple dimensions, inter alia,  
102 politics, society and environment. Critical earth-system processes such as climate change,  
103 rate of biodiversity loss, nutrient cycles and environmental pollutions (Griggs et al.,  
104 2013) are taken into account to prepare the classification. This classification helps  
105 organise the broad sustainability policy into manageable categories so that effective  
106 planning can be systematically carried out for each category. Strategic plan for  
107 sustainability could be developed at the macro level, which can then be detailed further  
108 based on the categories and sub-categories linking to the SDGs individually, which will

109 enable planning, management and monitoring in a methodical manner. Technical  
110 expertise and resources for rigorous planning are often lacking in low-income nations and  
111 this classification will help in systematically planning for sustainability. The authors  
112 could not find similar classification during the literature review and to the knowledge of  
113 the authors, such classification may not yet exist in the context of low-income nations.  
114 The classification proposed here is a bottom-up template that encourages low-income  
115 nations to set their own sustainability priorities, thereby empowering them and at the  
116 same time, also supporting the realisation of the SDGs. By encouraging low-income  
117 nations to set their own regional/national sustainability priorities, this classification  
118 integrates top-down SDGs with bottom-up policies and also enhances the sense of  
119 ownership the low-income nations have on global sustainability agenda. It may be  
120 pointed out here that this classification supplements SDGs and promotes local adaptation  
121 of the SDGs, and in no way is the classification intended to replace SDGs.

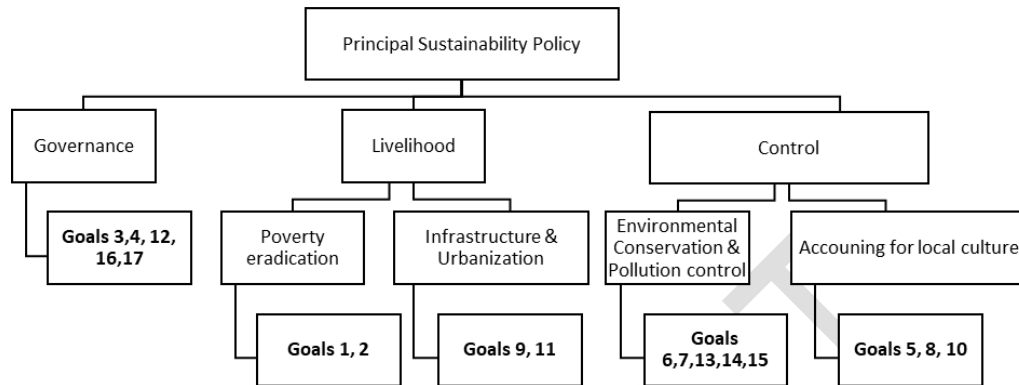
122 As recognised by Game et al. (2018), evidence for sustainability policy should be  
123 drawn from broader domains – e.g. expert knowledge, health communities etc. – rather  
124 than solely relying on standard disciplines.

125 The rationale for the policy classification presented below is that it allows  
126 governments and policy makers of low-income nations to focus exclusively on their most  
127 pressing needs and thus maximise the benefits of their limited resources. The sheer  
128 numbers of SDGs and associated targets can be overwhelming to low-income nations and  
129 it is anticipated that the classification proposed below will aid in consolidating and  
130 prioritising the relevant SDGs in a case-by-case basis. This allows broad SDGs and  
131 targets, which are hard to tackle, to be broken into manageable and affordable chunks.  
132 While a low-income nation does not have adequate resources to tackle all the SDGs  
133 designed for global scale, it may be able to leverage its limited resources to tackle its  
134 most pressing and relevant sustainability issues at local scale.

135 Figure 1 shows the classification of overarching sustainability policy (Principal  
136 Sustainability Policy) into three categories, namely, Governance, Livelihood and Control,  
137 with all seventeen SDGs falling under at least one of these categories. Livelihood  
138 category is further sub-divided into ‘Poverty eradication’ and ‘Infrastructure &  
139 Urbanisation’ sub-categories. Likewise, the Control category is further sub-divided into  
140 ‘Environmental Conservation & Pollution control’ and ‘Accounting for local culture’  
141 sub-categories. The scope covered in each of the categories and associated sub-categories  
142 and key actions needed to achieve the SDGs goals are presented in the following section.

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147 **Figure 1** Classification of sustainability policy  
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150 *3.1 Governance policy*

151 Governance policy guides the management of top-level government operations.  
 152 Meadowcroft et al. (2005) point out that governance for sustainability is a future driven  
 153 continuous process where governments need to address issues such as environmental  
 154 limits, sustainable resource management and demographics among other things. They  
 155 also emphasise that multilevel governance and coordination at local, regional, national,  
 156 international and global scales is crucial where decision-makers remain responsible to  
 157 citizens, communities and stakeholders. Key requirements for sustainability governance  
 158 as pointed out by Meadowcroft et al. (2005) could be adapted for low-income nations.  
 159 Brief summary of key requirements that they have described is provided in Table 1.

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167 **Table 1** Key requirements for sustainable governance (adapted from Meadowcroft et al.  
 168 2005)

Requirements	Examples
Appropriate political frameworks	Goal identification, monitoring, evaluation and continuous improvement at all levels of governance
A long-term focus	Inter-generational strategies, not a reactive response
Understanding of ecological processes and of social/ ecological interactions	Biodiversity, importance of preserving natural habitats, ecosystem services
Knowledge integration from natural and social sciences into decision making process	Circular economy, climate change, sustainable production and consumption patterns
Use learning processes	Experiment with options, draw lessons from failures

169  
 170 The governance policy for sustainability should embrace the principles of  
 171 decentralisation and empowering lower level administrations as well as making them  
 172 accountable. The degree of decentralisation has been found to be much less in low-  
 173 income nations compared to high-income nation (Olowu, 2003). This implies that the  
 174 lesser degree of autonomy of local governments in low-income nations affects their  
 175 growth potential. Sustainability oriented governance policy should ensure and promote  
 176 decentralization so that local governments can effectively execute local level  
 177 development projects and programs. For instance, the need to accelerate the  
 178 decentralization of Cameroon for sustainable development has been highlighted by  
 179 Kimengsi & Gwan (2017). Since decentralization empowers local communities, it should  
 180 be a crucial component of governance policy.

181 The lack of accountability of decision-makers in low-income nations is a key factor  
 182 leading to corruption and malpractices in the implementation of sustainable development.  
 183 Peace, justice and strong institution is Goal 16 (United Nations, 2015) of SDGs and  
 184 Transparency International (TI, 2017) has highlighted that SDGs cannot be achieved  
 185 without tackling corruption. Low-income nations rely heavily on aid from donor agencies  
 186 for various development initiatives. Although finding exact data is hard and maybe not  
 187 even possible, corruption on aid money is one of the biggest challenges in poor nations  
 188 (Kenny, 2017). Donor agencies need to work with governments to develop robust aid  
 189 flow monitoring mechanisms to understand how and where corruption happens.  
 190 Furthermore, all levels of governance require focused political will to combat corruption

191 by ensuring transparent and trackable coordination amongst all stakeholders as suggested  
192 by Mackey et al. (2018).

### 193 3.2 *Livelihood policy*

194 A livelihood comprises the capabilities, assets (including both material and social  
195 resources) and activities required for a means of living. A livelihood is sustainable when  
196 it can cope with and recover from stresses and shocks, maintain or enhance its  
197 capabilities and assets, while not undermining the natural resource base (Krantz, 2001).  
198 The livelihood policy category includes strategies to tackle major livelihood challenges  
199 of low-income nations such as poverty and economic growth. Thus, this policy can be  
200 further sub-divided into poverty eradication policy and infrastructure and urbanization  
201 policy as discussed below:

#### 202 203 3.2.1 Poverty eradication policy

204 This policy aims to achieve Goals 1 (No poverty) and 2 (Zero hunger) of the SDGs.  
205 Approaches to poverty eradication have to be identified on a case by case basis for every  
206 nation (possibly detailed to provincial, municipal and local/village level) and be built into  
207 the poverty eradication policy. Nevertheless, some key guiding principles that generally  
208 apply to majority of middle and low-income nations are: improving agricultural yields,  
209 improving non-farm economy and expanding income-earning opportunities (Yanagihara,  
210 2003) in general.

#### 211 3.2.2 Infrastructure and urbanisation policy

212 This policy combines two major Sustainable Development Goals of the United  
213 Nations, i.e. Industry, Innovation and Infrastructure (Goal 9) and Sustainable Cities and  
214 Communities (Goal 11) (United Nations, 2015). Two main purposes of this policy are to:  
215 a) guide infrastructural development and expansion and b) direct the urbanization  
216 process. As opposed to high-income nations, infrastructure, often built by depleting  
217 natural resources, is not highly developed in low-income nations. Therefore, low-income  
218 nations have the opportunity to utilize sustainable materials, techniques, and technologies  
219 for construction and management of sustainable infrastructure. Therefore, utilization of  
220 energy sources and materials that are regenerative and sustainable has to be built into  
221 infrastructure planning and policy.

222 Since the populations of middle- and low-income nations are expected to move to  
223 urban areas, the United Nations Development Programme (UNDP) has identified  
224 inclusiveness and resilience as important factors to promote sustainable urbanization



225 (UNDP, 2016). Therefore, urbanization policy should help improve equality and  
226 inclusiveness in cities so that equal opportunities are accessible to all the population.  
227 Likewise, a resilient city is able to adapt to changes without compromising its stability  
228 and measures that improve city resilience should be a part of urbanization policy  
229 (Coaffee et al., 2018; Keen & Connell, 2019; Brakman et al., 2015). Other important  
230 factors that should be considered in urbanization policy are approaches to tackle urban  
231 poverty and unsustainable modes of transportation. Options such as a car-free city  
232 (Nieuwenhuijsen & Khreis, 2016), and electric buses and trams also need to be explored  
233 for low-income nations as these options have thus far only been primarily focused for  
234 high-income nations.

### 235 3.3 Control policy

236 Control policy provides regulatory framework to ensure that development and  
237 construction works carried out under infrastructure and urbanization policy (see Section  
238 3.2.2) ensure sustainability. The Control policy can be further divided into two divisions  
239 as discussed below:

#### 240 3.3.1 Policy for environmental conservation and pollution control

241 This policy aims towards achieving Goals 6 (clean water and sanitation), 7 (affordable  
242 and clean energy), 13 (climate action), 14 (life in water) and 15 (life in land).  
243 Infrastructural development and expansion demand massive consumption of natural  
244 resources and energy, which can eventually lead to severe environmental degradation.  
245 Therefore, policy and guidelines need to be developed to control consumption of natural  
246 resources while building new infrastructure, as well as expanding existing infrastructure.  
247 The policy framework for sustainable urbanization as well as sustainable infrastructure  
248 development and expansion should include mandatory sustainability analysis. This  
249 analysis should objectively, and possibly quantifiably, measure sustainability by using  
250 applicable sustainability indices or metrics while planning infrastructural development or  
251 expansion and urbanisation. Carbon footprint, ecological footprint and exergy are some  
252 examples of sustainability metrics that could be utilised; however, formulation of new  
253 easy-to-use metrics may also have to be done on a case by case basis depending upon  
254 practicality. It is noteworthy that low-income nations may not have sufficient resources to  
255 perform complex sustainability analyses, especially if the analyses require high skilled  
256 manpower and high computational processing.

257 Issues of waste management and pollution control are likely to be critical with the  
258 construction and expansion of infrastructure as well as urbanization. Therefore, policies  
259 for the optimal management of waste and pollution are required. Adoption of circular

260 economy can be explored to minimize waste, pollution and natural resources  
261 consumption. Prospects of circular economy in ensuring sustainable development has  
262 been stated by Korhonen et al. (2018) which defines circular economy as economy  
263 constructed from societal production-consumption systems that maximizes the service  
264 produced from the linear nature-society-nature material and energy throughput flow. This  
265 is done by using cyclical materials flows, renewable energy sources and cascading-type  
266 energy flow.

### 267 3.3.2 Policy of accounting for local culture

268 This policy indirectly supports achieving Goals 5 (Gender equality), 8 (Decent work  
269 and economic growth) and 10 (Reduced inequalities) of the SDGs. Culture-led  
270 development programmes promote greater social inclusiveness and rootedness, resilience,  
271 innovation, creativity and entrepreneurship for individuals and communities, and the use  
272 of local resources, skills, and knowledge (UNESCO, 2012). On the other hand, ignoring  
273 culture can lead to bad policy (Small et al., 2010). Furthermore, culture has been  
274 identified as one of the pillars of sustainable development by United Cities and Local  
275 Governments (UCLG, 2018). Therefore, cultural beliefs and sensitivities of a community  
276 have to be carefully taken into account before formulating any policy on community  
277 development.

278 It may be noted that the policy classification proposed here is to help low-income  
279 nations either develop their own or identify high-priority UNSTATS indicators and  
280 actions (UNSTATS, 2017) most relevant to them. We argue that all low-income nations  
281 should be encouraged to identify and adapt the SDGs and their associated targets and  
282 indicators depending on the most pressing needs of individual low-income nations. This  
283 bottom-up approach of low-income nations proactively developing and identifying their  
284 own sustainability agenda will supplement the top-down approach of the United Nations  
285 handing the SDGs to low-income nations. Additionally, this bottom-up approach will  
286 enable the optimal utilisation of local knowledge and empower low-income nations by  
287 actively engaging them in the sustainability planning process.

## 288 **4 Goals prioritisation**

289 Previous sections of this paper systematically classified the overarching sustainability  
290 policy into manageable categories. This allowed detailed planning for implementation of  
291 sustainability policy by identifying key actions and measures that need to be taken in  
292 each category. Furthermore, all of the seventeen Sustainable Development Goals (SDGs)  
293 were assigned to the relevant policy category (refer Figure 1). In this section, we propose

294 that every low-income country prioritize the SDGs by taking local and regional contexts  
295 into account. The benefit of such prioritisation is effective planning that enables low-  
296 income nations to tackle their most pressing issues. For instance, if one takes a case of a  
297 landlocked country like Nepal, Goal number 14 may not be very important because this  
298 goal primarily deals with oceans. On the other hand, this Goal could be extremely  
299 important to the Republic of Maldives, which is also in South Asia, as the Maldives  
300 consists of islands. Furthermore, low-income nations typically have shortages of high  
301 skilled manpower, so addressing all the seventeen SDGs with equal priority is not  
302 practical. Another benefit of this prioritisation approach is that it allows low-income  
303 nations to set their own sustainability priorities and therefore ensures their higher degree  
304 of participation and ownership of the global UN agenda. It also empowers low-income  
305 nations by giving them more flexibility and leverage. The need for the Goals  
306 prioritisation was the main finding of the group discussions.

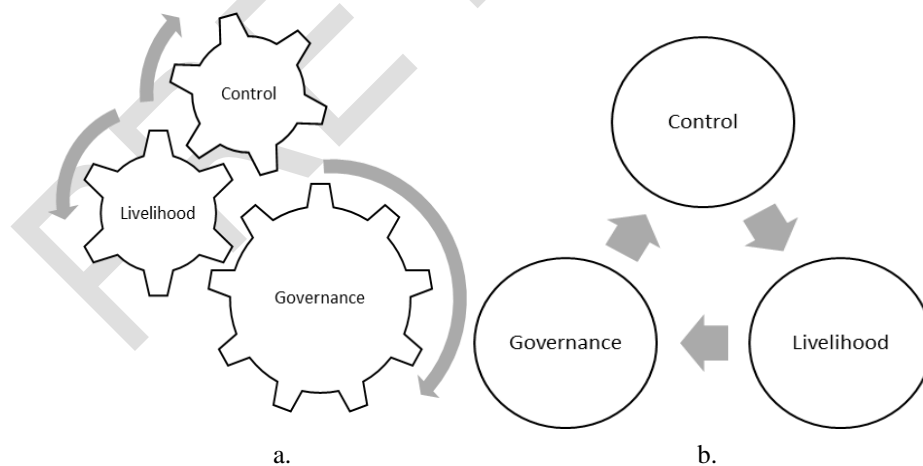
307 One approach to ensure that the prioritisation of SDGs is robust is to quantify the  
308 priority levels of all the Goals. This can be done by simple ranking or assigning a  
309 numerical value to each Goal based on its priority for a specific country. Once the  
310 prioritisation of the SDGs is done, interactions among high priority goals should be  
311 analysed. Such analysis provides valuable insights for planning and policy purposes and  
312 also helps to make the complex planning process more manageable. Here, it is  
313 noteworthy that all SDGs are interlinked and broad analysis of interlinkages among all of  
314 the Goals can be carried out. However, examining only high priority Goals and analysing  
315 their interlinkages can be very useful for regional and local-level planning, particularly  
316 considering the limitations of resources available to low-income nations. This paper  
317 examines Goals 1, 7 and 9 to analyse their interlinkages (Section 5). These goals are  
318 mainly chosen as examples for illustration, and similar analyses can be performed with  
319 other goals. One motivation for choosing these particular three Goals is that they are  
320 generally considered to be major challenges in achieving SDGs (Arif, 2015; Cobbinah et  
321 al., 2015) in low-income nations. It has been reported that focusing on Goal 1 can have  
322 compound positive effects on all SDGs (Lusseau and Mancini, 2019) and low-income  
323 nations such as Ethiopia recognise Goal 7 as a precondition to meet other Goals (Tosun  
324 & Leininger, 2017). Likewise, infrastructure (Goal 9) is at the forefront of G20's work to  
325 strengthen global growth (OECD, UNDP, 2019).

## 326 **5 Analysis of interlinkages**

327 The analysis of interlinkages between the categories, sub-categories and the SDGs  
328 (see Figure 1) is important to ensure that the plans and policies developed for achieving  
329 SDGs are harmonious such that a policy that positively impacts one SDG does not

330 negatively impact other SDGs. Although this might not always be practical, evaluating  
 331 impacts of a policy on all other prioritised SDGs rather than only on the Goal intended by  
 332 the policy will help in fine tuning the policy to optimise the trade-offs. Figure 2a shows  
 333 the interrelationships between the governance, livelihood and control – the governance  
 334 being the main enabler for sustainable livelihood, and both of these leading to the need  
 335 for setting control policy for environmental protection. It highlights the importance of  
 336 sustainable governance policy (see Section 3.1) in ensuring that livelihood enhancement  
 337 does not cause negative environmental impacts. Unchecked consumption of natural  
 338 resources to maintain livelihood is not feasible in the long-term as scarcity of natural  
 339 resources will affect quality of living. Therefore, control policies that ensure conservation  
 340 of natural resources while also enabling poverty alleviation are important. The  
 341 interrelationships between governance, livelihood and control policies mean that any one  
 342 of these policies can affect the other two as shown in Figure 2b. For instance, if the  
 343 control policies only ensure environmental protection by negatively affecting living  
 344 standards and livelihood of people by severely restricting consumption of natural  
 345 resources, such policies will fail and lead to the need of re-formulating governance  
 346 policies. Therefore, policies cannot be developed in isolation and a holistic approach to  
 347 policy development that takes into account the interdependence of governance, livelihood  
 348 and control is necessary.

349  
 350 **Figure 2** Interlinkages between Three Key Categories



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 354 Policy formulation can be an iterative process where each policy option has to be  
 355 evaluated multiple times to understand its collective effect on overall sustainability and  
 356 individual effect on each SDG. For example, if a new policy on poverty eradication  
 357 (Livelihood policy category) is formulated, its effects on environmental conservation and

358 pollution control (control policy category) need to be analysed and vice versa. In order to  
359 illustrate the importance of analysing SDGs for holistic and effective policy formulation,  
360 analysis of interlinkages among Goals 1, 7 and 9 is done below as an example. Planning  
361 for poverty eradication (Goal 1) should not be done in isolation but by ensuring that the  
362 planning is in harmony with other SDGs. If poverty reduction is accomplished by  
363 degrading the environment in such a way that the land eventually becomes infertile and  
364 uninhabitable, then poverty alleviation will only be temporary. Therefore, Goal 1 should  
365 focus on long term poverty alleviation, achieved by ensuring that natural capital is  
366 sustained during poverty alleviation. Long term success of Goal 1 can be greatly  
367 enhanced by access to sustainable energy (Goal 7) and development of sustainable  
368 infrastructure and industries (Goal 9) as Goals 7 and 9 ensure that environmental  
369 sustainability is taken into account while achieving Goal 1.

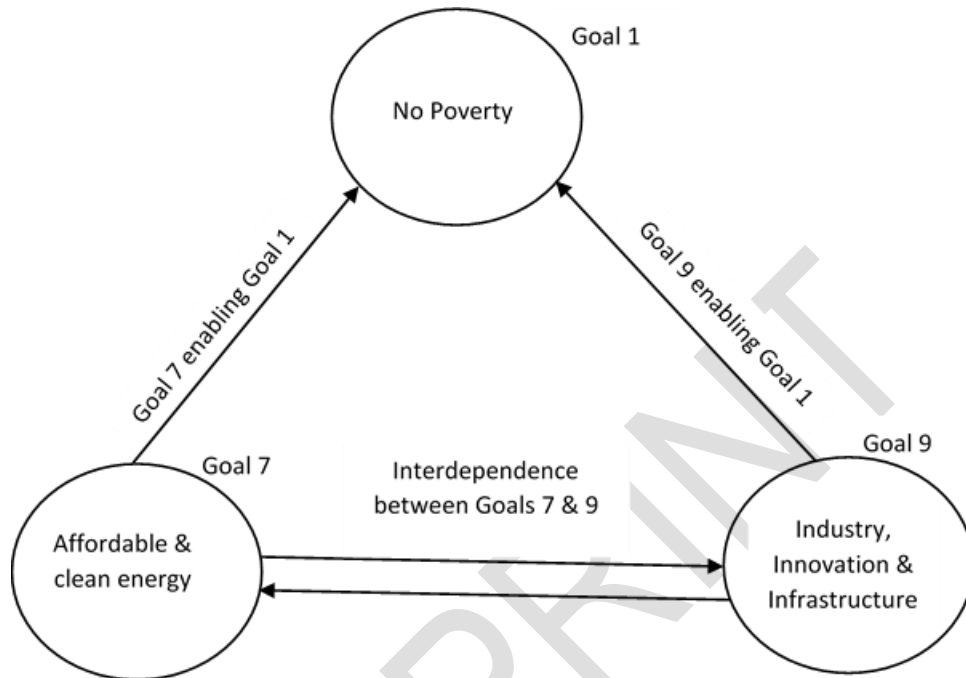
370 The experiences of China and India illustrate the roles of Goals 7 and 9 in achieving  
371 Goal 1. China drastically reduced its poverty over the past few decades (Yao, 2000) in  
372 which massive infrastructure development and industrialization played a major role  
373 (Huang et al., 2017; Athukorala, 2015; Lavopa and Adam, 2012). Likewise,  
374 infrastructure development has been found to be positively correlated with economic  
375 development in India (Kumari and Sharma, 2017). Both infrastructure development and  
376 industrialization require consumption of huge amounts of natural resources and energy.  
377 For instance, China surpassed the US as the world's largest energy consumer in 2009 (US  
378 EIA, 2011), and studies (Gozgor et al., 2018; Ozturk et al., 2010) have shown a direct  
379 relationship between economic growth and energy consumptions for middle and high-  
380 income nations. Overall, poverty eradication (Goal 1), energy access (Goal 7), and  
381 infrastructure development and industrialization (Goal 9) are strongly interlinked and are  
382 likely to be high priority goals for low-income nations.

383 The interrelationships among Goals 1, 7 and 9 are analysed by creating a conceptual  
384 representation shown in Figure 3. This figure shows that the realisation of Goal 9 can be  
385 greatly enhanced by meeting Goal 7. However, achieving Goal 9 can also enable meeting  
386 Goal 7, and thus there exists a co-dependence and synergy between these two Goals.  
387 Likewise, realisation of Goal 1 can be greatly enhanced by meeting Goals 7 and 9.

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**Figure 3** Interrelationships among Goals 1, 7 and 9 of SDGs



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400 As Goals 7 and 9 co-depend on each other and both these Goals support achieving  
401 Goal 1, policy planning that leverages interlinkages among Goals 1, 7 and 9 can be very  
402 effective for achieving the SDGs. Planning based on interlinkages among these Goals is  
403 discussed below.

#### 404 5.1 Planning for Goal 1

405 In order to plan for achieving Goal 1, two key factors, i.e. agricultural sustainability  
406 and rural non-farm sectors, are discussed here.

407  
408

##### 5.1.1 Agricultural sustainability

409 Agriculture plays a vital role in poverty alleviation, and agricultural sustainability is  
410 found to reduce the food-energy-water poverty nexus in Sub-Saharan Africa (Ozturk,  
411 2017). It could be for this reason that one major objective for the Least Developed  
412 Nations has been to make agriculture significantly more productive in order to achieve  
413 greater food security (UNTCAD, 2018). Some policies for higher agricultural output and  
414 income that have been stated are: increasing yields and labour productivity,  
415 diversification, crop upgrading and international certification, strengthening cross-  
416 sectoral linkages, and commercialization (UNTCAD, 2018). However, achieving all

417 these can be greatly facilitated by agricultural mechanization, which in turn requires  
418 energy access. If agricultural mechanization is accomplished utilizing conventional  
419 agricultural machinery, the needed energy is likely to come from fossil fuels such as  
420 diesel and other petroleum products.

421 Since massive consumption of fossil fuels is not sustainable environmentally or, in  
422 low-income nations, feasible economically, sustainable agricultural mechanization should  
423 be supported by deployment and implementation of renewable energy based electric  
424 agricultural machinery. Although mechanization is not mandatory for achieving Goal 1, it  
425 can greatly enhance the prospects of poverty eradication as mechanization increases  
426 agricultural yields and allows farmers to uplift their living standards. Electric drives for  
427 agricultural machinery have been explored (Buning, 2010), and the use of electric tractors  
428 is anticipated soon (NFU, 2017) in high-income nations. However, agricultural  
429 mechanization in low-income nations should also be based on renewable energy in order  
430 to minimize greenhouse gas emissions and ensure energy security. Since renewable  
431 energy generally utilises resources available within a given country instead of importing  
432 from other nations, it increases energy security. Additionally, use of renewable energy  
433 also reduces depletion rate of natural resources. Overall, sustainable energy access (Goal  
434 7) that does not rely heavily on fossil fuels should be considered as the means to realize  
435 poverty eradication in order to achieve long term success of Goal 1.

#### 436 5.1.2 Rural non-farm sector development

437 Rural non-farm activities consist of all non-agricultural activities which generate  
438 income to rural households, either through waged work or through self-employment  
439 (Davis, 2003). These activities are shown to reduce poverty (Davis, 2003; Hoang et al.,  
440 2014; Imai, et al., 2015) and are important to achieve Goal 1. Since all these activities  
441 require energy and infrastructure, sustainable energy (Goal 7) and infrastructure (Goal 9)  
442 should be utilized for the development of the non-farm sector because poverty alleviation  
443 that utilizes non-renewable energy resources, unsustainable infrastructure, or other  
444 limited natural resources will only be short term. For example, if a small agro-processing  
445 enterprise is planned as a non-farm activity, the electricity used by the agro-processing  
446 machineries should be renewable energy based. Likewise, if a construction of a house to  
447 be utilised as a hotel/tourist home-stay is planned as a non-farm income generating  
448 activity, the construction of house could be done by utilising sustainable building  
449 materials.

## 450 5.2 *Planning for Goals 7 and 9*

451 The planning for achieving Goals 7 and 9 should take into account the co-dependence  
452 of these Goals and the roles of these Goals to achieve Goal 1. Improvement in living  
453 conditions of the low-income people of Rwanda after access to electricity has been  
454 documented (Lenz et al., 2018). However, there is a need to couple energy access with  
455 income generating productive activities by developing the non-farm sector. Furthermore,  
456 energy access should support infrastructure development that aids in poverty reduction.  
457 For instance, communication and information have been identified as catalysts for  
458 poverty reduction and sustainable development (UNESCO, 2016), and energy is required  
459 to build communication and information infrastructure. On the other hand, infrastructure  
460 development is also required to enable energy access, e.g. power plants construction and  
461 distribution infrastructure. Additionally, factories and other industrial infrastructure that  
462 manufacture renewable energy components such as wind turbines, water turbines, and  
463 electric generators secure energy access. Thus, Goals 7 and 9 enable one another and  
464 these two goals have to be met by understanding their co-dependence and synergistic  
465 relationship.

## 466 **6 Research gaps**

467 This section points out research gaps in sustainable development studies of low-  
468 income nations in order to set out an agenda for future research. While some of the  
469 research gaps discussed below are derived from previous sections, it may be noted that  
470 this section also encompasses other broad sustainability issues pertaining to low-income  
471 nations that were identified from focused group discussions and consultations with  
472 development practitioners during the research period. Therefore, addressing these  
473 research gaps can facilitate in bridging the gaps between academic research and practical  
474 implementations in low-income nations. An important research gap for ensuring  
475 sustainability is the lack of qualitative and quantitative indicators that prioritize SDGs for  
476 low-income nations. This may have to be performed on a case by case basis for every  
477 low-income country because priorities can be country specific. Systematic approaches to  
478 prioritize SDGs also need to be explored for different geographical, political and cultural  
479 contexts.

480 Low-income nations lack sufficient data on the natural resources required to build  
481 large scale renewable energy systems and other infrastructure, which has been identified  
482 as one major challenge to achieving Sustainable Development Goals (Ndzabandzaba,  
483 2015). Research is required to develop robust data acquisition and management systems  
484 for low-income nations because these nations lack the sufficiently detailed data needed  
485 for almost every aspect of development. Furthermore, analysis based on ecological



486 footprint and biocapacity accounting has found that there is no strong correlation between  
487 per capita biocapacity and economic growth in low-income nations (Wackernagel et al.,  
488 2019). Biocapacity here refers to the capacity of a geographical area to supply renewable  
489 resources on a continual basis and to absorb its spillover wastes. This means that only  
490 very small portions of economic value chains are flowing back to the low-income people  
491 who own and manage their bioresources. Therefore, research is needed to better  
492 understand the interactions between biocapacities and poverty reduction in rural  
493 communities. Also, given the importance of a country's resource security, investigating  
494 the economic implications of resource dynamics is crucial (Wackernagel et al., 2019).

495 Another major gap is the lack of research on methodologies for the robust evaluation  
496 of international aid effectiveness. International development and donor agencies provide  
497 financial and other support for low-income nations, but how much of the provided  
498 support really reaches low-income people? Objectively verifiable indicators to evaluate  
499 the effectiveness of international aid need to be developed. Likewise, proper mechanisms  
500 to monitor public trust in governments need to be developed. Although the importance of  
501 governance structures based on welfare regimes that guarantee basic human rights and  
502 social security have been highlighted (Wood and Gough, 2006), such welfare regimes  
503 cannot function efficiently unless the public trust in government is high. The public trust  
504 in government and the public perception of the legitimacy of the government needs to be  
505 thoroughly examined for international financial and other supports to effectively function  
506 in low-income nations.

507 Analysis of the consistency of SDGs based on the DPSIR (Drivers, Pressures, States,  
508 Impacts and Responses) framework by Spangenberg (2016) has pointed out that  
509 pressures and drivers causing unsustainability are not sufficiently analysed and this is a  
510 major challenge in achieving the SDGs. In this context, it is necessary to identify  
511 pressures and drivers of unsustainability in low-income nations.

512 From a global sustainability point of view, an important research gap is the lack of  
513 analysis on the share of responsibility of low-income nations in causing impacts that  
514 threaten global sustainability such as anthropogenic climate change and environmental  
515 degradation compared to middle and high-income nations. If the share of low-income  
516 nations is insignificant compared to that of middle and high-income nations in  
517 threatening global sustainability, the United Nations should consider developing new  
518 sustainability agenda exclusively targeting middle and high-income nations. The  
519 discourse on sustainable development is considered to be of great significance because it  
520 is viewed as a crucial tool to achieve global sustainability but is the notion of 'sustainable  
521 development' still suitable for high-income nations or is this notion only suitable for  
522 middle and low-income nations? This question needs to be explored, specifically since  
523 the idea that perpetual growth and development can be indefinitely sustained is debatable.

524 Exploring this question will allow us to rigorously define the term ‘development’ and  
525 provide us valuable insights on how the definition of ‘development’ could be different for  
526 high, middle and low-income nations. It is noteworthy that the high relevance of  
527 ‘sustainable development’ is only due to the fact that it is considered to be a pathway and  
528 process to achieve sustainability at a planetary scale. Therefore, it is necessary to explore  
529 the types of ‘development’ that can be sustained indefinitely.

## 530 **7 Conclusions**

531 This paper provides a systematic approach to conduct sustainability policy planning  
532 for low-income nations by creating three categories of policies, i.e. Governance,  
533 Livelihood and Control. The Livelihood category is further divided into poverty  
534 eradication, and infrastructure & urbanisation. Similarly, the Control category is further  
535 divided into two sub-categories, namely, ‘environmental conservation & pollution  
536 control’ and ‘accounting for local culture’. Relevant United Nations Sustainable  
537 Development Goals (SDGs) are assigned to each category/sub-category. We then  
538 highlight key actions needed in each policy category to achieve SDGs. By creating a  
539 sustainability policy structure (Figure 1), we facilitate much needed analysis on  
540 sustainability policy planning exclusively focused on low-income nations.

541 We underscore the importance of prioritising SDGs based on their relative importance  
542 in a case by case basis for different countries as every low-income nation can have  
543 different priorities and therefore generalisation may not be feasible. We then provide an  
544 approach to further support the policy planning for the fulfilment of the SDGs based on  
545 analysing interlinkages of high priority SDGs. The importance of studying the  
546 interactions amongst categories, themes and SDGs goals has been discussed. This  
547 approach is illustrated by conducting interlinkage analysis of Goals 1, 7 and 9 (Figure 3)  
548 as an example since these Goals are of high priority to many, if not all, low-income  
549 nations. Moreover, research gaps that need to be filled are identified and discussed in  
550 order to set out research agenda for future research. We call for extensive collaborations  
551 among research institutions, universities, government bodies, international development  
552 and donor agencies and other stakeholders to work towards filling the research gaps  
553 highlighted in this paper.

554

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558

## References

559

Athukorala, P.C., Kunal, S. (2015) 'Industrialisation, Employment and Poverty',  
Forthcoming in Michael Tribe and John Weiss (eds.), *Routledge Handbook of  
Industrial Development*, London: Routledge, pp. 84- 95 [Online]  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2630400](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2630400) (Accessed 28 July  
2019).

564

Beltekian, D., Ortiz-Ospina, E. (2019) *Extreme poverty is falling: How is poverty  
changing for higher poverty lines?*, Our World in Data 2018 [Online]  
<https://ourworldindata.org/poverty-at-higher-poverty-lines> (Accessed 28 July 2019).

567

Böcher M., Krott, M. (2016) 'The RIU Model as an Analytical Framework for Scientific  
Knowledge Transfer', In: *Science Makes the World Go Round*, Springer, Cham,  
[https://doi.org/10.1007/978-3-319-34079-1\\_2](https://doi.org/10.1007/978-3-319-34079-1_2).

570

Brakman, S., Garretsen, H., van Marrewijk, C. (2015) 'Regional resilience across  
Europe: on urbanisation and the initial impact of the Great Recession', *Cambridge  
Journal of Regions, Economy and Society*, Vol. 8, Issue 2, pp. 225–240.

573

Broman, G.I., Robert, K.H. (2017) 'A framework for strategic sustainable development',  
*Journal of Cleaner Production*, Vol. 140 No. 1, pp. 17-31.  
<https://doi.org/10.1016/j.jclepro.2015.10.121>.

576

Buning, E. A. (2010) *Electric drives in agricultural machinery - approach from the  
tractor side*, 21<sup>st</sup> Annual Meeting Bologna; Club of Bologna [Online]  
[http://www.clubofbologna.org/ew/documents/KNR\\_Buning.pdf](http://www.clubofbologna.org/ew/documents/KNR_Buning.pdf) (Accessed 28 July  
2019).

580

Coaffee et al. (2018). 'Urban resilience implementation: A policy challenge and research  
agenda for the 21st century', *Journal of Contingencies and Crisis Management*,  
<https://doi.org/10.1111/1468-5973.12233>.

583

Cobbinah, P.B., Erdiaw-Kwasie, M.O., Amoateng, P. (2015) 'Rethinking sustainable  
development within the framework of poverty and urbanisation in developing  
nations', *Environmental Development*, Vol. 13, pp. 18-32.

586

Davis, J.R. (2003) *The rural non-farm economy, livelihoods and their diversification:  
Issues and options*, Natural Resources Institute, NRI Report No: 2753 [Online]  
<https://econwpa.ub.uni-muenchen.de/econ-wp/dev/papers/0510/0510016.pdf>.  
(Accessed 28 July 2019).

590

DESA (2020) *Progress of goal 1 in 2019*, Division of Sustainable Development Goals,  
United Nations [Online] <https://sustainabledevelopment.un.org/sdg1> (Accessed 1  
June 2020).

593

Game, E.T., et al. (2018) 'Cross-discipline evidence principles for sustainability policy',  
*Nature Sustainability*, Vol. 1, pp. 452-454.

595

Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M. C.,  
Shyamsundar, P., Steffen, W., Glaser, G., Kanie, N., Noble, I. (2013). 'Sustainable  
development goals for people and planet', *Nature Comments*, Vol. 495, pp. 305-  
307.

599

Gozgor, G., Lau, C.K.M., Lu Z. (2018) 'Energy consumption and economic growth: New  
evidence from the OECD nations', *Energy*, Vol. 153, pp. 27-34.

600

- 601 Hoang, T.X., Pham, C.S, Ulubaşođlu, M.A. (2014) ‘Non-Farm Activity, Household  
602 Expenditure, and Poverty Reduction in Rural Vietnam: 2002–2008’, *World*  
603 *Development*, Vol. 64, pp. 554-568.
- 604 Huang, Z., Lahiri, T. (2017) ‘China’s path out of poverty can never be repeated at scale  
605 by a country again’, *Quartz* [Online] [https://qz.com/1082231/chinas-path-out-of-](https://qz.com/1082231/chinas-path-out-of-poverty-can-never-be-repeated-at-scale-by-any-other-country/)  
606 [poverty-can-never-be-repeated-at-scale-by-any-other-country/](https://qz.com/1082231/chinas-path-out-of-poverty-can-never-be-repeated-at-scale-by-any-other-country/) (Accessed 28 July  
607 2019).
- 608 Imai, K.S., Gaiha, R., Thapa, G. (2015) ‘Does non-farm sector employment reduce rural  
609 poverty and vulnerability? Evidence from Vietnam and India’, *Journal of Asian*  
610 *Economics*, Vol. 36, pp. 47-61.
- 611 Jabareen, Y. (2008) ‘A New Conceptual Framework for Sustainable Development’,  
612 *Environment, Development and Sustainability*, Vol. 10, No. 2, pp. 179-192.
- 613 Keen, M., Connell, J. (2019) ‘Regionalism and Resilience? Meeting Urban Challenges in  
614 Pacific Island States’, *Urban Policy and Research*, Vol. 37, Iss. 3, pp. 324-337.
- 615 Kenny, C. (2017) ‘How Much Aid is Really Lost to Corruption?’, *Center for Global*  
616 *Development* [Online], [https://www.cgdev.org/blog/how-much-aid-really-lost-](https://www.cgdev.org/blog/how-much-aid-really-lost-corruption)  
617 [corruption](https://www.cgdev.org/blog/how-much-aid-really-lost-corruption).
- 618 Kimengsi, J.N., Gwan, S.A. (2017) ‘Reflections on Decentralization, Community  
619 Empowerment and Sustainable Development in Cameroon’, *International Journal*  
620 *of Emerging Trends in Social Sciences*, Vol. 1, No. 2, pp. 53- 60, DOI:  
621 10.20448/2001.12.53.60.
- 622 Korhonen, J., Honkasalo, A., Seppälä, J. (2018) ‘Circular Economy: The Concept and its  
623 Limitations’, *Ecological Economics*, Vol. 143, pp. 37-46.
- 624 Kumari, A., Sharma A.K. (2017) ‘Physical & social infrastructure in India & its  
625 relationship with economic development’, *World Development Perspectives*, Vol. 5,  
626 pp. 30-33.
- 627 Lavopa, A., Adam, S. (2012) Industrialization, employment and poverty. MERIT  
628 Working Papers 081, *United Nations University - Maastricht Economic and Social*  
629 *Research Institute on Innovation and Technology (MERIT)* [Online]  
630 <https://ideas.repec.org/p/unm/unumer/2012081.html> (Accessed 28 July 2019).
- 631 Lenz, L., Munyehirwe, A., Peters, J., Sievert, M. (2015) ‘Does Large-Scale Infrastructure  
632 Investment Alleviate Poverty? Impacts of Rwanda’s Electricity Access Roll-Out  
633 Program’, *World Development*, Vol. 89, pp. 88-110.
- 634 Loorbach, D. (2010) ‘Transition Management for Sustainable Development: A  
635 Prescriptive, Complexity-Based Governance Framework’, *Governance*, Vol. 23,  
636 No. 1, pp. 161-183.
- 637 Lusseau, D., Mancini, F. (2019) ‘Income-based variation in Sustainable Development  
638 Goal interaction networks’, *Nature Sustainability*, Vol. 2, 242–247.
- 639 Mackey, T. K., Vian, T., Kohler, J. (2018) ‘The sustainable development goals as a  
640 framework to combat health-sector corruption’, *Bulletin of the World Health*  
641 *Organization*, Vol. 96, No. 9, pp. 634- 643.
- 642 Meadowcroft, J., Farrell, K.N. and Spangenberg, J. (2005) ‘Developing a framework for  
643 sustainability governance in the European Union’, *International Journal of*  
644 *Sustainable Development*, Vol. 8, Nos. 1/2, pp. 3–11.

- 645 Mustunsir, M. (2015) ‘Sustainability vs economic growth: a third world perspective’,  
 646 *World Journal of Entrepreneurship, Management and Sustainable Development*,  
 647 Vol. 11, No. 4, pp. 312-324, <https://doi.org/10.1108/WJEMSD-04-2015-0018>.
- 648 Ndzabandzaba, C. (2015) *Data sharing for sustainable development in less developed*  
 649 *and developing nations*, Brief of GSDR 2015, United Nations, [Online]  
 650 [https://sustainabledevelopment.un.org/content/documents/615860-Ndzabandzaba-](https://sustainabledevelopment.un.org/content/documents/615860-Ndzabandzaba-Data%20sharing%20for%20sd%20in%20less%20developed%20and%20developing%20nations.pdf)  
 651 [Data%20sharing%20for%20sd%20in%20less%20developed%20and%20developing](https://sustainabledevelopment.un.org/content/documents/615860-Ndzabandzaba-Data%20sharing%20for%20sd%20in%20less%20developed%20and%20developing%20nations.pdf)  
 652 [%20nations.pdf](https://sustainabledevelopment.un.org/content/documents/615860-Ndzabandzaba-Data%20sharing%20for%20sd%20in%20less%20developed%20and%20developing%20nations.pdf) (Accessed 28 July 2019).
- 653 Nieuwenhuijsen, M.J., Khreis, H. (2016) ‘Car free cities: Pathway to healthy urban  
 654 living’, *Environmental International*, Vol. 94, 251-262.
- 655 NFU (2017) *Electric tractors by 2020? – a review of advanced vehicle technology in the*  
 656 *agricultural sector*, National Farmers Union, UK [Online]  
 657 <https://www.nfuonline.com/assets/93644> (Accessed 28 July 2019).
- 658 OECD, UNEP (2019) *G20 contribution to the 2030 Agenda - Progress and Way*  
 659 *Forward*, Organisation for Economic Co-operation and Development and the  
 660 United Nations Development Programme [Online]  
 661 <https://www.oecd.org/g20/topics/agenda-2030-development/G20-SDG-Report.pdf>  
 662 (Accessed 15 April 2021).
- 663 Olowu, D. (2003) ‘Challenge of multi-level governance in developing countries and  
 664 possible GIS applications’, *Habitat International*, Vol. 24, No. 4, pp. 501- 522.
- 665 Ozturk, I., Aslan A., Kalyoncu H. (2010) ‘Energy consumption and economic growth  
 666 relationship: Evidence from panel data for low and middle income nations’, *Energy*  
 667 *Policy*, Vol. 38, No. 8, pp. 4422-4428.
- 668 Ozturk I. (2017) ‘The dynamic relationship between agricultural sustainability and food-  
 669 energy-water poverty in a panel of selected Sub-Saharan African Nations’, *Energy*  
 670 *Policy*, Vol. 107, pp. 289- 299.
- 671 Robert, K.H. (2000) ‘Tools and concepts for sustainable development, how do they relate  
 672 to a general framework for sustainable development, and to each other?’, *Journal of*  
 673 *Cleaner Production*, Vol. 8, No. 3, pp. 243-254.
- 674 Spangenberg, J.H. (2016) ‘Hot Air or Comprehensive Progress? A Critical Assessment of  
 675 the SDG’, *Sustainable Development*, DOI: 10.1002/sd.1657.
- 676 Tosun, J., Leininger, J. (2017) ‘Governing the Interlinkages between the Sustainable  
 677 Development Goals: Approaches to Attain Policy Integration’, *Global Challenges*,  
 678 <https://doi.org/10.1002/gch2.201700036>.
- 679 TI (2017) ‘No sustainable development without tackling corruption: the importance of  
 680 tracking SDG 16’, *Transparency International* [Online],  
 681 [https://www.transparency.org/en/news/no-sustainable-development-without-](https://www.transparency.org/en/news/no-sustainable-development-without-tackling-corruption-SDG-16#)  
 682 [tackling-corruption-SDG-16#](https://www.transparency.org/en/news/no-sustainable-development-without-tackling-corruption-SDG-16#).
- 683 UCLG (2018) *Culture in the sustainable development goals: A guide for local action*,  
 684 *United Cities and Local Governments*. [Online],  
 685 [https://www.uclg.org/sites/default/files/culture\\_in\\_the\\_SDG.pdf](https://www.uclg.org/sites/default/files/culture_in_the_SDG.pdf).
- 686 UNCTAD (2018) *Achieving the sustainable development goals in the least developed*  
 687 *nations: A compendium for policy options*, United Nations, [Online]  
 688 [https://unctad.org/en/PublicationsLibrary/aldc2018d4\\_en.pdf](https://unctad.org/en/PublicationsLibrary/aldc2018d4_en.pdf) (Accessed 28 July  
 689 2019).

- 690 UNDP (2016) *Sustainable urbanization strategy*, United Nations Development  
691 Programme [Online],  
692 [http://www.undp.org/content/dam/undp/library/Sustainable%20Development/Urban](http://www.undp.org/content/dam/undp/library/Sustainable%20Development/Urbanization/UNDP_Urban-Strategy.pdf)  
693 [ization/UNDP\\_Urban-Strategy.pdf](http://www.undp.org/content/dam/undp/library/Sustainable%20Development/Urbanization/UNDP_Urban-Strategy.pdf).
- 694 UNESCO (2012) *Culture: a driver and an enabler of sustainable development*, United  
695 Nations Educational, Scientific and Cultural Organization [Online],  
696 <https://en.unesco.org/about-us/introducing-unesco>.
- 697 UNESCO (2016) *Sustainable Development in the Least Developed Nations - Towards*  
698 *2030*, United Nations [Online]  
699 <http://unesdoc.unesco.org/images/0024/002448/244835E.pdf> (Accessed 28 July  
700 2019).
- 701 United Nations. (2015) *Transforming our world: the 2030 Agenda for Sustainable*  
702 *Development* [Online]  
703 [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E)  
704 (Accessed 28 July 2019).
- 705 United Nations. (2018) *World Economic Situation and Prospects. Statistical Annex-*  
706 *Country Classifications* [Online] [https://www.un.org/development/desa/dpad/wp-](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2018_Annex.pdf)  
707 [content/uploads/sites/45/WESP2018\\_Annex.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2018_Annex.pdf) (Accessed 28 August 2019).
- 708 UNSTATS (2017) *Work of the Statistical Commission pertaining to the 2030 Agenda for*  
709 *Sustainable Development* [Online] <https://undocs.org/A/RES/71/313> (Accessed 20  
710 April 2021).
- 711 US EIA. (2011) *China and India account for half of global energy growth through 2035*,  
712 US Energy Information Administration 2011 [Online]  
713 <https://www.eia.gov/todayinenergy/detail.php?id=3130> (Accessed 29 July 2019).
- 714 Wackernagel, M., Lin, D., Evans, M., Hanscom, L., Raven, P. (2019) ‘Defying the  
715 Footprint Oracle: Implications of Country Resource Trends’, *Sustainability*, Vol. 11  
716 No. 7, <https://doi.org/10.3390/su11072164>.
- 717 Weiping, T. (2018) *China's Approach to Reduce Poverty: Taking Targeted Measures to*  
718 *Lift People out of Poverty*, International Poverty Reduction Center in China  
719 [Online] [https://www.un.org/development/desa/dspd/wp-](https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2018/05/31.pdf)  
720 [content/uploads/sites/22/2018/05/31.pdf](https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2018/05/31.pdf) (Accessed 28 July 2019).
- 721 Wood, G and Gough I. (2006). ‘A comparative welfare regime approach to global social  
722 policy’, *World Development*, Vol. 34, No. 10, pp. 1696-1712, ISSN 0305-750X.
- 723 Yao, S. (2000) ‘Economic Development and Poverty Reduction in China over 20 Years  
724 of Reforms’, *Economic Development and Cultural Change*, Vol. 48, No. 3, pp. 447-  
725 474. <https://doi.org/10.1086/452606>.
- 726 Zeigermann, U, Böche, M. (2020) ‘Challenges for bridging the gap between knowledge  
727 and governance in sustainability policy – The case of OECD ‘Focal Points’ for  
728 Policy Coherence for Development’, *Forest Policy and Economics*, Vol. 114.