Assessing the Integration of Environmental Justice and Sustainability in Practice: A Review of the Literature

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Abstract: The environmental justice (EJ) movement has been a key factor in the United States’ struggle to provide a healthy environment for all to thrive. The origins of the movement date as far back as the 1960’s, led primarily by people of color and low economic status communities living in America’s most polluted environments. More recently, the just sustainability movement calls for the inclusion of EJ considerations, including social justice, equity, and human rights, into sustainability science and initiatives. Whereas previous work has elucidated synergies between both concepts, this paper provides a literature review of studies that apply the concepts of EJ and sustainability in the US to inform ways in which the concepts are merging (or not) for practical applications. The primary objectives of this review are (1) to identify the common themes in which EJ and sustainability are applied, (2) to qualitatively assess the progression of the integration of these important movements in practical applications, and (3) to inform research gaps that exist in this area. In general, we find that despite the increasing conceptual emphasis on the need to integrate these important concepts, the reviewed scholarship reveals that in practice, the integration of EJ and sustainability remains piecemeal.

Keywords: environmental justice; sustainability; just sustainability; equity; sustainable development

1. Introduction

An abundance of environmental injustices plagues the United States (US), from lead poisoning, stemming from a shift in water supply for Flint, Michigan; cancer-causing toxins leaking from landfills in Dickson County, Tennessee; dichloro-diphenyl-trichloroethane (DDT) pollution discharged in wastewater effecting downstream communities in Triana, Alabama; and nuclear waste disposal conflicts in Sierra Blanca, Texas; to industrial air pollution from a steel plant in Dearborn, Michigan [1]. These are just a few examples highlighted by the United States Environmental Protection Agency (EPA), which focuses on environmental injustice case studies impacting communities in the US. In each case study, they share an underlying narrative of legacy industries who created pollution, causing exposure to pollution and/or major health issues (e.g., higher asthma and cancer rates) for communities of color and poor communities living nearby who were not the cause of the contamination.

These and other similar cases are told through the lens of environmental injustice—typically understood as the unequal exposure of low-income, minority communities to environmental risks and burdens that typically occur at the local to regional scale [2–5]. Thus, much environmental justice (EJ) research is concerned with issues of distribution, focused on who is burdened by environmental harms and who has access to environmental goods or services. However, another important aspect of EJ is considerations of equity in the procedural aspects of environmental management and decision-making. Because of the inclusion of both distributive and procedural aspects of EJ and its relevance to the U.S., here we adapt the US EPA’s definition of EJ as the fair treatment and meaningful
involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies [1].

Across the globe and in many disciplines, EJ has increasingly been incorporated and considered. As such, the interdisciplinary field of sustainability is ideal for increasing the incorporation of EJ and justice issues more generally. In a globalizing world with an increasing population and limited resources, there is growing demand for research and scholarship focused on addressing current and future sustainability challenges in an equitable manner. For example, emerging attention to global climate change has emphasized EJ related concerns, such as sea level rise impacts on small island states and agricultural impacts for indigenous communities related to a warming climate, predominately driven by greenhouse gas emissions generated by wealthier and industrialized economies. Because of this, and other resource distribution conflicts (e.g., conflicts over mining and palm oil), we are experiencing a global EJ movement [6]. Moreover, the field of sustainability, especially scholars doing place-based sustainability work, demands transdisciplinary approaches that require collaboration or co-production of knowledge between academics and non-academics, such as community stakeholders [7]. Thus, the opportunity for EJ considerations within sustainability practice increases since it is a concern likely to be of interest to communities. Without considerations for EJ in sustainability planning and practice, there is a risk of unintentionally perpetuating existing inequalities or creating new injustices within communities.

Despite the growing emphasis on the need for integrating EJ and sustainability, at least conceptually [8–10], there remains some sustainability scholarship that focuses on conservation-based or deep ecology concepts that lack attention to the social, economic and political contexts, including justice and equity issues [11–14]. Fortunately, much progress towards more interdisciplinary and systems-based approaches to studying sustainability issues have emerged. For example, the field of earth systems science offers a way for natural scientists to work across disciplines to build a more unified understanding of our planet, including the impact of human activities on global change [15]. Additionally, from social science theory, ‘ecological modernization’ provides a framework for analyzing the institutional reforms necessary for reducing human impacts on our environmental systems or natural resources [16]. Despite these increasing opportunities for more meaningful, cross disciplinary scholarship, the consideration of justice and equity in sustainability scholarship remains a challenge, particularly in practice or in application. This is a bit counterintuitive, given that the frequently quoted definition of sustainable development in the 1987 Brundtland Report is ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ [17] (p. 43). This definition explicitly calls for intergenerational justice as a central and underlying principle of sustainability. On the other hand, intragenerational equity considerations, although arguably important, remains often under-developed in the general concept of sustainability.

Perhaps the most utilized model of sustainability is described as having three main pillars: environmental, economic, and social. This triple bottom line approach is typically illustrated using three intersecting circles, with sustainability or sustainable development at the center. This particular conception emerged from the academic literature as a response to critiques of traditional economic based thinking and approaches that lacked adequate consideration for social and ecological perspectives and the need for a more balanced approach to economic growth as a solution to social and ecological problems sought by the United Nations [18]. Early publications on the three-pillar model explicitly refer to equity and justice considerations as part of the social system/pillar (e.g., [19,20]). However, the three-pillar approach to sustainability has often been criticized for neglecting the social pillar relative to the environmental and economic dimensions [21], in part because it can be challenging to realize and operationalize in practice [22]. In particular, equity is considered a neglected or under-researched aspect of the social pillar, especially at the local level [23]. It is important to note that many scholars call for the expansion of the three-pillar conception
of sustainability to create a more modern approach that incorporates additional pillars. For example, ‘culture’ is often referenced as a necessary fourth pillar [24,25], while others encourage frameworks that emphasize more integrative thinking across pillars [26].

This lack of attention to the justice related elements of sustainability is particularly evident in sustainability education programs. For example, a recent study examining new sustainability requirements for undergraduates attending the University of Vermont found that although sustainability courses are found throughout many different disciplines, most of which address all three pillars of sustainability, issues of EJ were only addressed in 17% of those courses in science, technology and math [27]. Another study on sustainability curriculum assessment at the University of Wisconsin–River Falls found, among other things, that many of the sustainability courses in the program favored environmental themes alone, with little or no consideration for EJ [28].

Nevertheless, we see an increase in the incorporation of EJ in sustainability scholarship, namely coining the term ‘just sustainability’ which emphasizes the need for a meaningful integration of sustainability and EJ concepts [9,29]. In particular, this concept adjusts the widely used Brundtland definition of sustainable development to the following, “The need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems” [30] (p. 5). One challenge for this integration of EJ with sustainability is the greater focus on and allocation of funding for research on the scientific and/or technological aspects of sustainability, yet the major barriers to achieving and practicing sustainability remain in the social or cultural domains of the issue. For example, Keivani (2010) [31] discusses key challenges for urban sustainability across the globe, stemming from poor governance and the resulting intra-urban social inequities characterized by exclusion, poverty, and crime. Moreover, numerous scholars have made the case that it is our cultural values and worldviews that drive people to accept or reject the science of climate change, and that without building a social consensus around climate as an urgent issue to address the problem will go largely unresolved [32–34].

To help address this relative lack of attention to the social pillar of sustainability, and more specifically explore the integration of EJ and sustainability in the academic literature, we completed a literature review. While previous work has already outlined the need for the integration of EJ and just sustainability and offers comparisons and synergies between the two movements [8–10,35], the key contribution of this paper is to explore the integration of these movements in actual scholarly practice within the US. To accomplish this, we conducted a literature review of scholarship in the EJ and just sustainability space published between 1990–2020. While we acknowledge that studies exist that investigate the integration of sustainability and EJ using other methodologies [33–35], we are not aware of any literature reviews on this particular topic. The primary objectives of this review were to (1) identify common themes for which EJ and sustainability are being integrated, (2) qualitatively assess the progression of the integration of these important movements, and (3) inform research gaps that exist in this area. The overarching goal is to help guide and inform sustainability scholars and changemakers seeking to aid in the transformation of the sustainability field to more broadly address social needs and welfare in balance with important environmental concerns.

2. Materials and Methods

The literature review was completed using all databases available within the Web of Science (WoS) at the University at Buffalo. WoS is an online literature database library system that provides access to multiple databases that provide citation data for peer-reviewed papers across disciplines such as physical and life sciences, health sciences, social sciences, and arts and humanities. Although the WoS does not provide an exhaustive literature review on a topic (other articles on this topic can be found on Google Scholar, for example), the results are scholarly and reproducible. Our goal is not necessarily to include all papers on EJ and sustainability topics, but to assess the overall trends of
integration, common themes, and identify areas that are underrepresented in the scholarly
work reviewed. This choice to focus on a single database also allowed for a thorough and
detailed review of each article that fulfilled our criteria, which we consider a strength of
this analysis.

Our initial search terms included “Environmental Justice” AND “Sustainability” (query: (TS = (“Environmental Justice”)) AND TS = (“Sustainability”)), from 1900 to 2020 (index date: 1 January 1900 to 31 December 2020), which yielded 688 results. To make our search more manageable, it was decided to help narrow the search further by limiting it to case studies or applications in the US. With the additional search term of “United States” added to our query (TS = (“Environmental Justice”)) AND TS = (“Sustainability”) AND TS = (“United States”), the search yielded 65 results. For context, a search over the same timespan using only the search term “Sustainability” yielded 236,850 results. This means that less than one percent of the literature inventoried by the WoS explicitly integrates sustainability with EJ. Additionally, comparing our 65 results using all three search terms (EJ, Sustainability, and United States) to the total hits when searching for “EJ” and “Sustainability” reveals that only about nine percent of the sustainability literature inventoried in WoS that integrates EJ has a particular focus on the US. Thus, our literature review contributes to an underexplored subtopic of sustainability scholarship.

It is important to note that we chose not to include other specific forms of justice as
search terms (e.g., distributive, recognitional, or procedural justice) to keep our results
focused on EJ issues in particular. Although these terms are considered to be specific forms
of EJ [36], and do ultimately come up in our review findings (see Section 3.2), they are also
used to define particular aspects of social equity and justice more generally [37]. Therefore,
including them in our initial search terms, we felt, would broaden the scope of our review
to include scholarship not necessarily related to environmental injustices.

We refined the initial search by selecting peer-reviewed articles written in English
only, which left 60 articles. In compiling the 60 articles, we applied our screening questions
to determine whether or not they were appropriate for our study. Our screening questions consisted of:

1. Do the authors use the term ‘environmental justice’ AND sustainability?
2. Was the article focused on a place in the United States?
3. Is the research applied to a particular case study or does it use empirical data?
4. Was the article written within the window of 1990–2020?
5. Is the article published in a peer-reviewed journal?

In screening the articles, we noted if a study was included or excluded. Out of the 60 screened, 21 articles were excluded. Thirteen were excluded because they were commentaries about EJ and/or sustainability without actual application or empirical results. We also excluded two articles that were categorized as review papers without a specific application, and five that were not focused on data or case studies within the US. One other article was excluded because it was an empirical study about sustainability education, not applied to an actual community (however we do cite this paper in the introduction of this article).

Given our screening criteria, 39 of the 60 articles remained in our literature review,
which are the focus of the initial analysis. We conducted an iterative coding process on
these 39 articles that involved reading the articles, generating coding terms, coding for
key terms, and comparing and contrasting potential codes. Our coding process entailed
identification of the following codes; (1) How are the terms EJ and sustainability defined
or used in the paper? (2) What is the key contribution of the study to the literature?
(3) What was the key issue or injustice being analyzed/studied? (4) Was there a particular
population/demographic being disadvantaged or discussed? (5) Was the injustice explicitly
related to sustainability or did the sustainability study explicitly integrate aspects of equity
or justice? These codes allowed us to qualitatively identify themes and sub-themes based
on observations from the literature. To assess the integration of EJ and sustainability, we
primarily used the results from coding question number 5. To help with this assessment,
we also refer to notions of weak vs. strong just sustainability to help articulate the range of integration found and differentiate between the types of justice (distributive, procedural, and recognitional) discussed or referenced in the literature review.

Based on the results of our initial search, a second search was conducted for literature focusing on the topic of “just sustainability”. This term repeatedly appeared in the articles reviewed in our initial analysis and was interpreted as an important movement, influencing the integration of EJ and sustainability. The term ‘just sustainability’ was coined by Julian Agyeman and colleagues as an explicit way to link social inequities and environmental sustainability policy and practices [38,39]. Specifically, it is defined as development that addresses four policy principles or criteria: wellbeing and quality of life; meeting the needs of present and future generations; enabling justice and equity in terms of recognition, process, procedure, and outcome; and living within ecosystem limits [29,39]. Although this concept refers more explicitly to incorporating social justice and equity more broadly as a core component of sustainability, it was discovered in our review of the literature as a term that often encompassed the incorporation of “environmental justice” and “sustainability”. Therefore, we felt that the incorporation of this term was relevant to understand the current landscape of integration between EJ and sustainability in practice.

During this secondary search, 61 articles were yielded (query: TS = (“just sustainability”)) from 1900 to 2020 (index date: 1 January 1900 to 31 December 2020) across all databases within the WoS. Records not published in English, not classified as an article, and published outside of the US were marked ineligible, eliminating 31 records. Of the remaining 30 articles, four appeared in the initial search (i.e., duplicates), 10 were not considered empirical or case studies, five were not cases or analysis within the US, and one was an education study, leaving 10 articles that were added to the data analysis. The 10 articles were reviewed using the same coding process as our initial search, allowing us to integrate the search results into one more comprehensive literature review. With the addition of these articles focusing on just sustainability, our literature review included 49 articles in total.

Although the 49 articles included were thoroughly reviewed, we acknowledge that there are limitations to the scope of this work. Because we limited our search to the WoS database, there likely remains a significant amount of scholarship in the area of EJ and sustainability that was not reviewed as part of this study. Additionally, our focus on practical applications within the US also means that there are perhaps many examples from other places and contexts that were not considered. Moreover, the narrow search terms employed, although enabling our literature review to be focused on EJ issues in the US in particular, may have excluded scholarship that focuses on more specific forms of EJ (including procedural, distributive and/or recognitional justice), which are also considered important aspects of social equity more broadly. Future studies exploring integrated applications of EJ and sustainability across other scholarly databases and/or other places and contexts and reviews focusing on particular forms of EJ and how they are represented within sustainability scholarship would be of interest.

3. Results

Our findings are organized into three sections, one for each of our key research objectives. First, we summarize the themes generated from this literature review, next we describe the integration of EJ and sustainability, and lastly, we identify research gaps.

3.1. Research Objectives 1: Themes within the Literature

The literature review revealed five major categories of EJ and sustainability topics, as illustrated in Table 1. Each category will be discussed separately below, providing brief information about each article reviewed and an overall summary of the key findings for each category.
Table 1. Summary of the major themes found in our literature review.

| Theme                                                | Description                                                                                       | Articles (n = 49)                                                                 |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Distribution of environmental risks and harms         | Unequal exposure or impacts from pollution or other harms on underrepresented and/or vulnerable groups. | Mittlefehlfdt 2018 [40] Thomas 2020 [41] Abel, White, and Clauson 2015 [42] Benediktsson 2017 [43] Loring 2013 [44] Pellow & Vazin 2019 [45] Gen, Shafer and Nakagawa 2012 [46] Pulford, Polidoro, & Nation 2017 [47] Sansom et al. 2016 [48–51] |
| Distribution of environmental amenities                | Unequal access and/or distribution of environmental resources in communities.                     | Tarrant & Cordell 1999 [48–51] Yi et al. 2019 [52] Jennings, Larson & Yun 2016 [53] Rigolon et al. 2020 [54] Flocks et al. 2011 [55] Riley & Gardiner 2020 [56] Youth et al. 2016 [57] |
| Food justice and urban agriculture (UA)               | Studies that focus on the different benefits and social constructions of UA for different populations, and unintended consequences of UA on justice issues. | Martin, Clift, & Christie 2016 [58] Egerer et al. 2018 [59] Maurer 2020 [60] Alkon, Cadji, & Moore 2019 [61] Egerer & Fairbairn 2018 [62] Davenport & Mishtal 2019 [63] Stanko & Naylor 2018 [64] Alkon 2008 [65] McClintock et al. 2016 [66] |
| Justice in sustainable development and planning       | Studies that connect EJ issues with sustainable development. Many papers offer specific case studies and examples of this integration and lessons learned for future planning. | Krueger & Savage 2007 [67] Di Chiro 2018 [68] Finn and McCormick 2011 [69] Hess and Winner 2007 [70] Liao, Warner, & Homysy 2019 [71] Rosan, 2012 [72] Burke et al. 2009 [73] Brady & Monani 2012 [74] Lubitow & Miller 2013 [75] Mahmoudi, Lubitow, & Christensen 2019 [76] Roman et al.2017 [77] Garcia-Cuerva, Berglund, & Rivers 2018 [78] Jayakaran et al. 2020 [79] Meenan, Howell & Hachadorian 2019 [80] Houston & Zuniga 2019 [81] Agyeman & Evans 2003 [82] Meenan, Fromuth, Soro 2018 [83] Seymour 2012 [84] Hirsch 2008 [85] Vivoni 2013 [86] |
| Metrics and Tools (4 articles)                        | Various approaches are described for integrating EJ and sustainability.                            | White-Newsome et al. 2009 [87] Norman et al. 2012 [88] Wilson et al. 2015. [89] Opp 2017 [90] |

3.1.1. Distribution of Environmental Risks and Harms

A significant category in our review included nine articles that described EJ issues related to environmental risks experienced by vulnerable or disadvantaged communities, many of which were analyzed on the local scale (i.e., city and county), often placed within a historical context. This localized understanding was able to reveal the inequitable impacts of environmental harms on marginalized communities who were often excluded from com-
munity planning processes. There were three main types of studies in this category: (1) two papers focused on point-source pollution and implications for surrounding communities, (2) five papers that describe environmental risks not connected to a specific point source, and (3) three studies that compare communities’ perceptions with environmental pollution analysis.

The first paper that focused on point-source pollution and implications for surrounding communities is Mittlefehldt (2018) [40], who provides a historical account of the development of the Genesee Power Station, a wood-burning power plant in Flint, Michigan as an example of how the burdens of industrial-scale biomass power systems built in the 1980s and 1990s tend to fall on poor, non-White communities. In a more recent article, Thomas (2020) [41] mapped the distribution of New York State’s industrial pollution from 2000 to 2015 with a particular focus on Tech Valley, known as the geographic hub of the state’s investment in high tech job growth. It was found that the worst aspects of older ‘low technology’ have not been offset by newer ‘high technology’ in the region, despite the industry’s claim of environmental sustainability. An interesting result of this study is that the recent exposures to pollution are shifiting to more privileged communities, potentially decreasing environmental inequalities in this region.

Second, our literature review revealed that the concept of EJ seems to be expanding beyond legacy industrial pollution cases to include examples of unequal environmental harms and risk not related to a particular pollution source. For example, in a 2015 Seattle case study, Abel, White and Clauson (2015) [42] found that conflicts related to gentrification, greening of the city, and growth management have led to pollution exposure risk in the same places as populations that have socioeconomic vulnerability. In ‘Beyond the Sidewalk’, Benediktsson (2017) [43] argues that the distribution of pedestrian risk across American suburbs should be thought of as a form of environmental injustice, with more deaths occurring from pedestrian injury each year than asthma in the US. Like EJ issues related to airborne toxins, pedestrian risk is distributed unequally with regard to socioeconomic status. That is, people with low financial resources are more likely to travel on foot, placing them at a higher risk of being struck by a vehicle.

In an essay by Loring (2012) [44], it is described how commercial fisheries in Alaska are often perceived as sustainability success stories through marketing campaigns, yet problems of food insecurity and disenfranchisement of Alaska Natives are well documented. The paper explains how metrics and technologies used in current fisheries management are based upon maximum sustainable yield approaches, which are oriented to single-species outcomes. The essay makes the case for other management models that draw from alternative ecological concepts to promote more diversified strategies for natural resource harvesting. It is argued that these approaches may more holistically and equitably improve sustainability outcomes in Alaska.

The last article in this section, Pellow and Vazin (2019) [45] focused on an example of environmental racism occurring in prisons, in which the majority of inmates are people of color and undocumented people suffering from disproportionate health risks and harms. The paper discusses conditions that have shaped the present political landscape of racial and immigration conflicts and considers those dynamics in the context of the literature on EJ. It includes specific case studies that exemplify these injustices and racism in prisons and discusses the need for future analysis to help address these issues in the future.

In terms of community perceptions of pollution, the papers reviewed examine the assumption that communities have accurate perceptions about the existence and distribution of environmental harms. In particular, Gen, Shafer and Nakagawa (2012) [46] tested this assumption using survey and operational data related to San Francisco’s wastewater system. When compared, these data suggest that people’s perceptions of the distribution of environmental harms do not align with empirical measures. Instead, perceptions of exposures were more associated with socio-economic and physical characteristics of the neighborhoods than their actual exposures. The authors conclude that the perceptions of EJ in this case resembled social equity issues more than environmental equity issues.
In contrast, other studies indicate that communities perceive environmental risks accurately. Pulford, Polidoro, and Nation (2017) [47] conducted a pilot study of six urban recreational fishery lakes in Phoenix Arizona, many located within or near lower income and higher minority populations. They surveyed anglers to determine their fish consumption patterns and perception of pollution in the lakes to compare the results with actual water contamination analysis. The anglers reported eating recreationally caught fish, even though they thought the water might be polluted. Indeed, the surface water samples collected showed varying levels of potentially harmful organic contaminants. In this case, the anglers’ perceptions of pollution were correct. The authors discuss how the economic and minority status may play a role in increasing one’s vulnerability and exposure to pollutants, in this case local anglers that depend on the fish they catch as a source of food.

Finally, Sansom and colleagues (2016) [48] perform a comparative study that collected survey data and conducted surface water analysis for heavy metals in a small neighborhood of Houston, Texas. The goal was to determine if the community concerns for environmental contaminants would be validated through environmental research in an area plagued by industrial sites, poor infrastructure, flooding, and poor air quality. Findings indicate that most respondents were concerned, and rightfully so, given that water samples revealed alarming levels of a variety of metals known to be toxic. The alignment between concern and the analysis supports the notion that residents within a community can offer valuable insights and assistance to community-based environmental research.

In summary, the authors found it interesting that although most of the EJ case studies reported through the US EPA are cases of pollution related to specific sources, there were only two of the papers reviewed that could be classified this way. There were, however, several papers not related to a pollution point source at all, but to more spatially dispersed non-pollution issues, namely gentrification in Seattle, pedestrian risk for the American suburban poor, food insecurity and disenfranchisement among Alaska Natives, and racism in American prisons. For many of these cases, it is the lower-income or minority groups being studied that were indeed suffering from higher exposure or impacts related to environmental or situational harms. One exception however was Mittlefehldt [40], who found that the recent exposures to air pollution in Tech Valley in upstate NY are shifting to more privileged communities. This may be more common in the future as higher tech business districts become located in more affluent areas. Another few papers in this category compared the perceptions of harms and risks associated with pollution to measured pollution, finding that community perceptions are often validated empirically, however the distribution of harms related to pollution may be perceived inaccurately by communities. Regardless, all three papers indicate that the results have important implications for the role of government agencies in their engagement with the public on efforts to improve EJ and sustainable development.

3.1.2. Distribution of Environmental Amenities

Seven articles illustrate a shift in EJ, which has moved beyond exploring the distribution of environmental harm to include the inequities associated with environmental amenities. In general amenities tend to increase the attractiveness of a given location. They can increase the value of land or housing and contribute to local growth and well-being [49,50]. The key amenities discussed in our literature review are outdoor recreation sites, ecosystem services, urban tree cover, and reservoir shorelines.

The earliest study is by Tarrant and Cordell (1999) [51], who examined the spatial distribution of outdoor recreation sites and their proximity to census block groups (CBGs) in order to determine potential socio-economic inequities, particularly surrounding Chattahoochee National Forest in North Georgia. Results revealed that CBGs with a higher proportion of lower income households were significantly more likely to be situated within 1500 m of desirable recreation sites (i.e., wilderness area, campground, and/or good fishery habitat) than CBGs with higher incomes. The study suggests that the traditional concern over environmental equity (i.e., that lower income and/or non-populations are discrimi-
nated against) may be unfounded in this case. The study (and its overall approach) has implications for recreation management, calling for managers and planners to be more aware of who is receiving the benefits of outdoor recreation.

Along similar lines, Yi and colleagues (2019) [52] focused on the inequity in accessing ecosystem services among redlining communities in San Antonio. The paper presents an empirical investigation of the relationship between the supply of ecosystem services (including vegetation as a proxy for carbon storage and species diversity) to the distribution of human-wellbeing, finding that Hispanic and African American minorities derive fewer ecosystem benefits and experience greater health risks and socio-economic disadvantages than White, more privileged areas of the city.

Additionally, focused on ecosystem services, Jennings, Larson, and Yun (2016) [53] argue that achieving health equity involved all communities having access to cultural ecosystem services that influence social determinants of health. They explore relationships between cultural ecosystem services (e.g., aesthetic value and recreation) and social determinants of health (i.e., factors related to community context, the built environment, and socio-economics) provided by urban green space in particular. This study highlights contributions that are widely recognized (e.g., connections between green space and physical activity) and also those that warrant further investigation (e.g., links between green space, sense of place, and social capital). The paper concludes by offering examples of future EJ research questions that explore mechanisms for improving social determinants of population health through urban green spaces.

Speaking of green spaces, Rigolon and colleagues (2020) [54] describe a ‘Just Green Enough’ approach to prevent environmental gentrification surrounding parks and greenways. Using comparative case studies of park projects in Atlanta, Chicago, and Philadelphia, the article presents four sets of strategies meant to be used by park and recreation professionals to more equitably develop new or renovate existing parks and greenspaces in marginalized communities. Strategies consider issues relevant to maintaining affordable housing and ethno-racial diversity in communities surrounding parks and allowing for diverse engagement with community outreach activities.

Flocks and colleagues (2011) investigated disparities in benefits of urban tree cover in Miami-Dade County, Florida [55]. This study analyzed variables such as urban forest cover, diversity of trees, and tree condition among White, African American, and Hispanic communities. The results indicate that White communities enjoyed the greatest amount of energy savings due to trees. Hispanics however, benefit from more air pollution removal than the other two groups. African American communities received the least amount of ecosystem services in terms of air pollution removal and energy savings than did the other two groups. African American communities had the greatest amount of potential planting space for trees and the greatest percentage of street trees. The article discussed how existing challenges in the built environment for low-income and communities of color (i.e., substandard housing and higher initial pollution levels) can negatively influence their ability to improve their environment and can mediate the benefits that communities receive from tree cover. Additionally, focused on urban tree cover, Riley & Gardiner (2020) [56] examined the distributional equity aspects of urban tree canopy cover and the derived ecosystem services across nine U.S. geographical diverse cities. The authors hypothesized that both the tree cover and ecosystem service benefits would be positively associated with variables of higher income and education levels and negatively associated with variables related to poverty, lower education levels, population density, etc. These results did not consistently support their predictions, suggesting that inequities are not universal but context specific. The study concluded that understanding and addressing challenges with inequities requires understanding the local social-ecological system if broader sustainability goals are to be achieved.

Drinking water supply reservoirs as an amenity was analyzed in Youth and colleagues (2016) [57]. The authors investigated if reservoirs in North Carolina have induced demographic shifts in the communities adjacent to the newly created lakeshores. They found the
ratio of White to non-White people was significantly higher in communities located near the reservoir shorelines, and even as North Carolina overall became less White from 1990 to 2010, the ratio of White to non-White people near the shoreline increased. The authors suggest that the results are consistent with other studies, indicating shifts associated with environmental gentrification and amenity migration and raising concerns about EJ and social sustainability that should be considered when planning and building infrastructure that creates environmental amenities.

In summary, the variety of articles focusing on distributional equity of environmental amenities as a form of EJ in this category illustrates a broadening of the EJ field beyond historical, point-source pollution type cases. Here, we see a variety of different amenities being researched, ranging from outdoor recreation sites, urban tree cover, ecosystem services, and shorelines. Although most of the studies found unequal access and/or disparities in benefits derived from these amenities, with the poorer and minority populations typically being at a disadvantage, in the case of outdoor recreation sites in North Georgia [51], it was actually the lower income and non-White demographics who were more likely to be situated in closest proximity to desirable recreation sites. This case, among others, support the notion that inequities are not universal and are often context specific.

3.1.3. Food Justice and Urban Agriculture

Another category includes nine articles focused on a particular form of an environmental amenity related to local food production, which included urban agriculture (UA), community gardens, farmer’s markets, and other food related initiatives. Gardening and accessing local produce have become popular in many urban areas for a variety of reasons, as the following articles suggest.

To inform the nutritional, ecological, and social sustainability contributions of urban agriculture, Martin, Clift, and Christie (2016) [58] explore three case studies of community gardens in New York, London, and San Francisco. Although the study finds that the benefits differ according to many local conditions, their field studies indicate very low food outputs relative to the populations of their catchment areas, meaning that a great share of urban food will continue to come from multiple foodsheds well beyond their urban peripheries. The authors discuss that a major benefit of community gardens is social, providing an opportunity to increase ecological knowledge of urban populations and a growing appreciation for organic food and its role in promoting sustainability and health.

Egerer and colleagues (2018) [59] investigated the role of community gardens across three counties in California. They measured how aspects of self-reported gardener well-being varied in relation to the social opportunities of surrounding neighborhoods and the biophysical features of the landscapes surrounding the gardens. The results show improvements in gardener wellbeing through gardening across social and biophysical gradients. The study also reveals that gardeners are motivated by diverse reasons, varying from gardening in order to connect to nature, to improve food access, and/or to enhance time spent with family. The study concludes that community gardens are important for supporting many wellbeing benefits and that policies to maintain and protect gardens should prioritize neighborhoods with needs for connecting to nature and enhancing social interaction within the community.

Additionally, Maurer (2020) [60] investigates the distinctions between gardens created for two different primary purposes in Elmwood, MA, including gardens created for neighborhood upkeep and those created for ecological sustainability. The article identifies differences in gardening methods, spatial forms, and aesthetics, depending on the gardeners’ motivations, which are related to experiences of race and inequality. The article concludes with the realization that gardening can serve to both perpetuate inequities, while at the same time represent opposition to the lack of market and policy responses to climate change and social inequity.

On the other hand, Alkon, Cadji, and Moore (2019) [61] investigate the issue of green gentrification occurring in Oakland, California. The authors found that activists, who are
attempting to solve issues related to the accessibility of healthy food and address other food injustices, have realized that the creation of environmental amenities such as gardens, health food stores and farm-to-table restaurants have been contributing to an upscaling of neighborhoods, causing displacement of low-income households. Similarly, Egerer, and Fairbairn (2018) [62] explore the effects of urbanization on community formation and commons management in community gardens, which they suggest is a necessary step for just sustainability in urban areas. In particular, they examine how the pressures associated with urbanization have influenced three community garden landscapes in the central coast of California. The findings suggest that the production of space and the social relations within the garden are both influenced by urbanization, specifically causing issues of resource struggles and social inequities.

With a different focus, Davenport and Mishtal (2019) [63] critically examine the sustainability initiatives and practices of urban farming in Florida. The authors explore the extent to which these initiatives consider a community’s race and socioeconomic class when working to provide sustainably grown food in diverse communities. The findings reveal that because the initiatives are focused on non-political environmental benefits over community benefits (using the same or similar approach to food justice across disparate communities), they overlook the experiences of the low-income, marginalized communities that they sought to help, inhibiting the success of their food initiatives. Along the same lines, Stanko and Naylor (2018) [64] examine measures enacted in recent years to facilitate UA in Philadelphia, finding that there is a disconnect between the processes by which UA gains acceptance and the way UA advocacy and policymaking is approached, which the authors argue may perpetuate existing inequalities around food production and access. More specifically, the paper argues that the sustainability narrative of UA tends to be viewed as an urban amenity promoting environmental consciousness, whereas this narrative is not beneficial for those who have been growing food to feed their families and communities for decades. Moreover, making UA a part of achieving equity does not address existing injustices, such as access to jobs, land, resources, and economic opportunities and oftentimes as UA becomes formalized, it can result in the exclusion of those that have the community-based knowledge.

To inform different perspectives of UA within a community, Alkon (2008) [65] investigated the social construction of the environment for two urban farmers’ markets in the San Francisco Bay Area, one located in an affluent, White neighborhood the other in a low-income, largely minority and food insecure area. Alkon found distinct framings for each. In the former, locally grown organic food is predominantly viewed as a way that urban residents can connect to nature, which aligns well with the wilderness narrative that dominates the US environmental movement. However, the latter tends to frame local food systems as a response to racism and inequality, more in line with EJ issues. The author indicates that the variation in social constructions of the environment suggests that not all projects working for justice and sustainability envision the integration of the two in the same way, suggesting that the just sustainability paradigm is more like a cross-pollination than a fusion.

Additionally, more recently, McClintock and colleagues (2016) [66] examined the motivations behind and spatial distribution of residential gardens across two socio-economically differentiated areas of Portland. Based on their results, it is suggested that engagement in UA is differentiated along spatial and socioeconomic lines. They found that the more educated respondents were engaging in UA for environmental reasons, whereas the more low-income respondents were relying on their gardens for food security. The broader impacts of this work speak to the need for differentiated sustainability messaging that is sensitive to the motivations that resonate with diverse populations.

The above articles emphasize that UA is often framed as a promotion of environmental sustainability, despite its implications on equity and justice. According to our review, positive impacts of UA include addressing food access and food insecurity, connections with nature in an urban environment, and increased health and social capital. In contrast,
several papers take a critical look at UA initiatives, investigating if and how the initiatives consider race and socioeconomic issues, finding that justice related considerations are often lacking. It is also clear from these articles that different population groups benefit from and perceive the importance of UA differently, ranging from issues of food security, opportunities to connect with nature and/or other community members, increases in health and wellbeing, and mechanisms to address issues of racism and EJ. The articles speak to the implications of these diverse social constructions, including the need for differentiated messaging related to UA to more effectively resonate with diverse populations.

3.1.4. Justice in Sustainable Development and Planning

Twenty articles in our review focused on sustainable development and planning, particularly how to better integrate methods of addressing EJ issues into planning for sustainable development. This was the largest category. Interestingly, most of the articles found in our second search on just sustainability were placed here. Although some of the papers already discussed in our review may have implications for planning, these papers are specifically framed as useful for urban development and strategic sustainability initiatives. We further divided these articles into subcategories, including the following: two primarily conceptual pieces that discuss the integration of EJ and sustainable development but also include examples or cases to support the conceptual contributions; four articles that offer a review of sustainability planning documents and/or websites looking for evidence of EJ integration; nine papers that discuss the integration of EJ and sustainability through specific types of greening projects (i.e., green infrastructure, wind energy, bike paths, urban forestry, etc.); and finally we have a subcategory with five papers that claim to offer effective frameworks or models of just sustainability projects.

First, examining the conceptual relationship between sustainability and justice, Krueger and Savage (2007) [67] argue that despite some excellent work on the concept of just sustainability, current constructions of sustainable development are inadequate to capture the broad array of social and economic issues found in the city-region. In particular, the authors emphasize the lack of consideration for economic development concepts in urban sustainability, which tend to be focused on environmental problems. The authors provide an example case study of a hospital privatization process in Boston, helping to illustrate the consequences of this socio-economic inadequacy of sustainable development.

A very different concept is explored by Di Chiro (2018) [68], who offers an interesting examination of cautionary tales about environmental crises and how these stories support a portfolio of sustainability theories in response. One particular story that is emphasized is the ‘miner’s canary’ which the author describes as a metaphor to argue that ‘some of us are more vulnerable and bear more of the costs of a toxic social and economic system, while others of us benefit from these disparities’ (p. 537). Di Chiro explains how this narrative illustrates the importance of addressing the suffering of the most vulnerable within sustainability planning, in order to protect society’s social and environmental systems from peril. Di Chiro also provides an account of his own work with community groups with the goal of co-producing a model for a more just sustainability.

In terms of promoting EJ in sustainability planning, the following four articles examine sustainability websites and/or plans, looking for evidence of integration between EJ and sustainability. Each emphasizes the lack of attention to justice and equity concerns.

First, Finn and McCormick (2011) [69] analyze climate change adaptation and mitigation plans, each with environmental issues as an identified goal, for the three largest cities in the U.S. (New York, Los Angeles, and Chicago) to evaluate the degree to which they engage economic and social equity issues. Consistent with other studies, they reveal a lack of meaningful attention to issues of equity in particular. In many cases, issues of procedural and geographic equity are referenced, however they were often vague and lacked specificity about solutions to the acknowledged inequities. The authors point out the disconnect between theory and practice, concluding that while all three plans make
introductory claims alluding to a holistic approach, none seem to have robustly supported that claim’ (p. 413).

Next, Hess and Winner (2007) [70] examined city government web sites, each located within the 20 largest metropolitan areas in the U.S., looking for evidence of sustainability initiatives and connections between those initiatives and social justice. They found that only a few cities had an office specifically devoted to sustainability, while a handful of others had environmental departments with sustainability initiatives within them. However, most showed no evidence of high priority sustainability programing or sustainability work was occurring on a piecemeal basis in various departments. The authors also found that even in cities where sustainability was a high priority goal there was a lack of evidence indicating that social justice issues were being considered as part of the effort. The paper goes on to describe case studies of cities undertaking urban greening initiatives with integrated social justice goals to offer examples where city governments can enhance the level of equity and sustainability with minimal financial commitments.

Third, Liao, Warner, and Homsey, (2019) [71] examined a 2015 survey with almost 1900 cities and counties across the United States and found that only 26% of local governments report prioritizing social equity in their sustainability policy. In their study they used distributional justice as a framework to connect social equity policy, and a procedural justice to determine how communities were being engaged. They press the need for more formal structures that are intentional about involving minoritized communities to be involved throughout the sustainability planning process.

Lastly, Rosan (2012) [72] focuses on New York City’s 2007 sustainability plan, called PlaNYC, to investigate how the plan deals with equity and EJ concerns. In particular, it explores the extent to which the plan has influenced the City’s actual planning process related to land-use decisions. The paper presents a framework for evaluating sustainability plans like PlaNYC for promoting EJ and just sustainability. Rosan finds that PlaNYC does include a number of programs that promote EJ through sustainability planning, but that there is room for NYC’s consultation process with EJ communities.

The earliest paper published representing a specific example and/or case study where EJ and sustainability are integrated within sustainable development/planning projects was Burke and colleagues (2009) [73], which focuses on increasing active living in densely populated and diverse Somerville, MA. Many interventions to strategically improve active living over time are discussed, which include working with community-based organizations and communicating messages about active living to diverse communities. The described community planning process led to the prioritization of EJ and active living issues jointly. This case study offers lessons learned for other cities and regions, seeking to create positive change in an equitable fashion.

Next, Brady and Monani (2012) [74] discuss the complexities of wind energy projects on tribal lands using the framework of just sustainability (following Agyeman and colleagues). The authors discuss how this alternative framing can empower disenfranchised groups involved, due to the focus of social justice (i.e., generate economic benefits for tribes) as an integral aspect of achieving sustainability goals (i.e., mitigate or offset greenhouse gas emissions). Ultimately, they argue that the models used in their case studies demonstrate efforts to advance many of the goals of just sustainability and are successful in some respects but fall short in others. The article suggests that shifts towards just sustainability in renewable energy projects, particularly on tribal lands, will result in more equitable outcomes for participants.

One year later, Lubitow and Miller (2013) [75] offer details of a bikeway development project happening in a gentrifying area in Portland, Oregon. The authors provide two distinct narratives around this project, one was apolitical, that focused on the improved safety and access features of the new bike path from predominantly the cyclist community. The other narrative was one of historical injustices, including exploitation and marginalization from the African American community. This polarization of the bikeway project led to the city using a more inclusive planning process with a more diverse stakeholder committee.
that allowed for discussions about gentrification and discrimination, ultimately leading to an alternative design for the project that included a much greater consideration for equality and justice. Ultimately, the paper suggests that “Cities interested in embracing the idea of sustainability should not assume that the broader popularity of “green” infrastructural changes will meet community demands for greater efficiency, security, or safety; rather, planners and decision makers should assume that all community members have a unique vision for their local environment and that their input is a critical mechanism for truly sustainable outcomes—and for formulating a vision of sustainability that resonates with a broader set of constituents” (p. 126).

Building on the same bikeway development case study in Portland, Mahmoudi, Lubitow, and Christensen (2019) [76] combine digitized spatial data from participatory mapping exercises and focus groups with the community. It is found that most participants’ travel destinations are outside of downtown Portland and that participants experience planning and sustainability in a highly localized manner, challenging the equity rationale of the downtown investment. The authors argue that the top-down planning model used in this case study, which presumes the spatial diffusion of benefits is equitable, is inherently ahistorical and fails to benefit those in historically marginalized neighborhoods. They also argue for the value of community-oriented research, which, in this case study, inspired community organizations to formally oppose a city-led project based on the inequitable distribution of infrastructure benefits.

Particular to urban forestry, Roman and colleagues (2017) [77] discuss long-term urban forest change on the University of Pennsylvania’s urban college campus. The study discusses influential greening, development and planning movements both on and off campus that played significant roles in supporting this change. The study concludes that increasing urban tree cover requires long time scales and systematic management, along with a clear urban design vision and long-term commitments. Although this study does not explicitly call out implications for EJ communities, it does emphasize the importance of including diverse perspectives from community members during the planning process to incorporate EJ considerations in urban tree planting campaigns.

Next, Garcia-Cuerva, Berglund, and Rivers (2018) [78] seek to address EJ concerns related to the implementation of green infrastructure (GI). GI projects are increasingly being developed to offer a sustainable urban stormwater solution that provides a range of ecosystem services and can foster communities through increased aesthetics, increasing property values, and providing shared green spaces. However, like many other environmental amenities GI tends to be favored in privileged communities, whereas more marginalized groups tend to be located in areas suffering from environmental degradation. The modeling approach described helps planners prioritize the placement of GI in underprivileged communities and is applied to a particular underprivileged community in Raleigh, North Carolina. Findings indicate that underprivileged communities can benefit from GI-based stormwater practices, such as providing opportunities for environmental education and awareness, and offer strategies for water conservation and reduced flooding, which can provide economic relief.

Another study on GI was Jayakaran and colleagues (2020) [79], who offer perspectives on successes and challenges of GI implementation to manage stormwater in Oregon and Washington based on discussions at a regional summit. The paper describes six challenges that impact GI adoption and six themes for possible strategies to overcome these challenges. The six challenges that were identified include: the lack of coordination, traditionalism, site-specific scales, environmental costs, a lack of expertise, and little consideration for maintenance. The six strategies identified were: the need for adaptive design and maintenance, the placement of GI for maximum impact, the concept of collective impact, valuation of GI, equity and GI, and the intersection of GI and community health. As such, the paper includes a section that summarizes GI through an equity lens, revealing a pronounced risk of green gentrification in areas with GI, and suggests more research is needed to determine causal relationships between GI and displacement.
Additionally, Meenar, Howell, and Hachadorian, (2019) [80] conducted a qualitative analysis to assess USEPA Brownfield redevelopment plans to understand the potential impacts on vulnerable communities. Their findings demonstrated most plans discuss economic cost and gains without much consideration for the people in these brownfield locations. Many of the projects highlighted the “greening” of brownfield sites but they often did not explore how these efforts could have a human impact. While EJ was presented as the premise of these USEPA efforts, they often had little evidence of fully committing to the human aspect of valuable communities. The authors summarize brownfield redevelopment planning efforts and provide strategies for incorporating EJ throughout.

Lastly, Houston and Zuniga (2019) [81] assess the design, function, and placement of a strategy for greening freeways known as freeway cap parks, or parks built on decks above sections of low-grade freeways to help regenerate communities, conceal traffic, reduce air pollution, and provide green space. The paper examines cap parks in 24 US cities to identify four cap park development models that can be adapted worldwide to green freeway segments and reconnect communities. The authors also examined the distribution of cap parks and found that they are located in areas that could help address disparities in park access in freeways corridors. The case studies stress the struggle within the cap park sustainability discourse to balance economic, environmental, and equity concerns. The study concludes that planners considering cap parks as part of their greening and sustainability initiatives should take strong steps to address housing affordability and gentrification concerns for adjacent communities.

This final sub-section of our planning category includes five papers that explicitly claim to offer lessons learned and helpful models for successfully integrating the concepts of sustainability and justice. The most comprehensive article in this category is by Agyeman and Evans (2003) [39], who investigate the nexus of theoretical compatibility between EJ and sustainability across a portfolio of projects. Five topics relevant to both movements including land use planning, solid waste, toxic chemical use, residential energy use, and transportation are described, offering what the authors call tentative conclusions, including how the empowerment of community members into decision making processes is essential for procedural justice.

Next, Meenar, Fromuth, and Soro (2018) [36] explain the process of using an EJ framework (including considerations of distributive, procedural/participatory and recognition justice) to address watershed concerns while managing risks within the EJ community of West Ambler in southeastern Pennsylvania. The study emphasizes aspects of community engagement in this planning process. The lessons learned from this case study may be beneficial for other communities interested in taking a similar approach towards sustainable watershed planning.

Third, a case study by Seymour (2012) [82] considers the Audubon Center at Debs Park, an urban nature center in Los Angeles, CA, as an example of a justly sustainable project in an urban park. The authors conclude that the project, in vision at least, may embody the concept of ‘weak’ just sustainability, since the justice and equity portion of the concept’s definition are ‘attended to but not privileged’ (p. 176). The paper goes on to describe what a ‘strong’ just sustainability project looks like, one that places justice and equity at the core of its environmental sustainability goals. The author recognizes the complexity and challenges of translating stated goals of just sustainability into practice.

Fourth, Hirsch (2008) [83] looks specifically at an initiative in Chicago called the New Allies for Nature and Culture that promotes the integration of environmental and social justice work. The initiative conducted an applied anthropological research methodology and focus groups with representatives from diverse stakeholders in the region. Hirsch identifies five common concerns shared by both the environmental and social justice organizations: health and food, youth development, arts/creative practices, economic development, and climate change. Three models for integrating social and environmental issues are also described, each with the potential to build stronger relationships between
both types of organizations. The article discusses the need for ‘translation’ experts that work between both movements to promote just sustainability.

The last paper in this subcategory interestingly highlights the intersection of skateboarding and sustainability initiatives in Chicago by Vivoni (2013) [84]. This unique paper makes the case that young people, specifically skateboarders, are agents of change, as they promote an ethic of care for the built environments in which they live. One of the example sustainability-theme projects included in this paper includes grassroots activism by the Little Village Environmental Justice Organization, in which a local competition showcased skateboarding as a way to educate young people about EJ. Vivoni claims that an alternative model of sustainability emerges from the concept of caring for the built environment through play.

For this category, many of the manuscripts offered case studies of specific sustainability and planning projects, providing lessons learned to better consider EJ issues in future planning efforts. The types of projects in this category range from EJ considerations in brownfield redevelopment plans, freeway cap parks, urban forestry, bikeway planning, green infrastructure, and projects related to renewable energy. These case studies range in terms of the depth in which EJ concerns were addressed. From this category in particular we see some common practices or recommendations to support the integration of EJ and sustainability, notably the importance of empowerment and inclusion of key stakeholders and community groups within the decision-making processes to promote procedural equity, which ultimately helps produce more just and equitable outcomes. The recommendation provided by Hirsch [83] about the need for translation experts working between the EJ and sustainability movements to promote just sustainability was found to be a particularly meaningful and perhaps actionable recommendation. Additionally, the authors agree with Vivoni’s [84] suggestion, about considering youth as effective change-agents within communities and the importance of providing EJ education opportunities as part of a strategic plan to increase awareness and prevent future inequities.

3.1.5. Metrics and Tools

Our last category offers measures and tools that were found in our literature review to inform or aid in the integration of EJ and sustainability for planning purposes. While the first two articles have specific types of applications, these studies present more generally applicable tools for scholars.

First, White-Newsome and colleagues (2009) [85] offer an approach for identifying potential areas of vulnerability to heat, focusing on Wayne County, MI as a case study. Extreme heat is known to have varying impacts among different socio-demographic groups, especially in urban areas, depending on a variety of factors, including income, age, and race. The method involves using secondary data sources (i.e., census tract and land cover/land use data) with primary data collection of temperatures across urban areas to validate the need for heat warning systems for specific locations that are particularly vulnerable. The authors emphasize how visually showing spatial overlaps between areas of high population vulnerability and higher environmental exposure may be particularly useful for understanding the EJ implications of climate change for U.S. cities. A few years later, Norman and colleagues (2012) [86] presented a Modified Socio-Environmental Vulnerability Index (M-SEVI) for cross-border planning efforts involving vulnerable and/or underrepresented populations, using the Arizona–Mexico border as an example application. The authors suggest that the M-SEVI can be used as a first step in addressing EJ issues for binational planning and decision-making.

Another tool called “Environmental Justice Radar” offered by Wilson and colleagues (2015) [87], is a form of public participatory geographic information system (GIS). The community-centered approach provided community members with an opportunity to assist with the development of the tool and to understand environmental health issues related to pollution through data exploration. The researchers argue that more community-based mapping approaches are needed to be thoughtful about the impacts of sustainability
efforts while eliminating environmental hazards and health disparities. Finally, Opp (2017) [88] identifies a gap in sustainability efforts in American cities, namely the lack of consideration for social equity. It is argued that a measure to help define and assess social equity is needed, given that the concept remains nebulous and understudied. Therefore, this article offers a working definition of social sustainability in order to facilitate the identification of measurable aspects of the concept for American cities. This definition is then used to introduce four key dimensions of social sustainability (i.e., equal access and opportunity, EJ, community and the value of place, and basic human needs) and some sources for measuring these dimensions.

In this final category, scholars have begun to guide the integration of EJ and sustainability through metrics and tools. Some of the tools are fairly specific to certain applications, such as the approach described by White-Newsome and colleagues [85] for identifying vulnerability to extreme heat, which has strong implications for justice issues related to climate change. Additionally, the Vulnerability Index offered by Norman et al. [86] is specific to justice issues within cross-border planning efforts. On the other hand, the Environmental Justice Radar [87] is more general, offering a way in which to engage the public and communities in reporting EJ cases and sharing relevant data with communities. Additionally, the social equity measures discussed by Opp [88] are viewed as being widely applicable to a range of projects and planning efforts, seeking to meaningfully integrate justice into sustainability initiatives.

3.2. Research Objectives 2: Assessing Integration of EJ and Sustainability

In general, our literature review revealed a wide range of how well EJ and sustainability concepts were integrated in academic scholarship. We found many case studies where equity and justice considerations were being considered explicitly in sustainable development projects or played a central or underlying component of the planning process. However, some of the studies only refer to EJ issues with brief mentions of sustainability and others are more heavily focused on sustainability related initiatives, with scant attention to EJ considerations. For example, the Roman and colleagues (2017) case study, which focuses on tree cover on an urban college campus, briefly refers to the importance of the inclusion of diverse perspectives in the planning process for incorporating EJ considerations in tree planting initiatives [77]. On the other end of the spectrum, the Brady and Monani (2021) paper explicitly utilizes just sustainability principles to analyze case studies of wind energy projects on tribal lands, providing lessons learned for incorporating just sustainability considerations in sustainability initiatives much more broadly [74]. In the former, justice is a minor consideration, in the latter it is a primary focus and goal of the paper.

This observed range in integration of EJ and sustainability can be conceptualized as weak vs. strong just sustainability, as suggested by Seymour [82]. This builds upon notions of weak vs. strong notions of sustainability in environmental economics more generally, where weak sustainability assumes that human capital can substitute for natural capital, whereas strong sustainability assumes that human and natural capital are not interchangeable but complimentary [89]. Seymour suggested that in cases where justice concepts are considered in sustainability planning and projects, but not of primary importance, they represent examples of weak just sustainability, whereas strong just sustainability projects place justice at the core of their environmental sustainability goals. We find this classification helpful to communicate the progression of integration of EJ and sustainability. Whereas our literature review predominately includes papers with strong justice considerations by design, and therefore considered potential cases for strong just sustainability, we still came across several papers in the sustainability space that did not take explicit steps to address injustices, although they did recognize the need and importance of doing so.

Another way to assess the integration of EJ and sustainability concepts is to refer to distinct types of social equity and justice and how they are considered throughout the EJ focused literature we reviewed. Following Meerow, Pajouhesh, and Miller [37]...
there are three dimensions or types of equity to consider: (1) Distributional equity, or the distribution of goods, services, and opportunities; (2) procedural equity, which is the equitable participation in decision making processes; and (3) recognitional equity, which includes acknowledgement and respect for different groups (including the recognition of history and needs). There is one paper we reviewed by Meenar, Fromuth, and Soro (2018) that utilizes an EJ framework that included considerations for all three forms of justice in the context of sustainable watershed planning [36]. In most of the papers we reviewed, however, the authors tend to focus on one, sometimes two forms of equity, but only a select few incorporated considerations for all three. Below we provide a short description of the consideration of all three types of equity and justice found in our review.

Many of the studies in our review refer to issues of distributional equity in particular. All of the papers in the ‘Distribution of Environmental Harms’ and the ‘Distribution of Environmental Amenities’ categories explicitly refer to the inequitable distribution of environmental related harms or benefits across communities. Although the actual harm or amenity of focus vary greatly, this form of inequity is clearly the most studied and arguably the most closely associated with EJ case studies. This aligns with the findings of Meerow, Pajouhesh & Miller [37], which found considerable variation in the extent to which cities focus on equity in resilience planning in particular, with the dominant conceptions of equity being associated with the distributional dimension.

In terms of procedural equity, we did find a reoccurring theme in several articles about the lack of inclusion within environmental planning or decision-making processes, resulting in unjust outcomes for certain population groups. This was particularly explicit in the category of ‘Distribution of Environmental Harms’, where several authors referred to procedural equity as the cause or driver of unjust outcomes related to the distribution of environmental harms. Agyeman and Evans (2003) also emphasize the need for empowerment of community members into decision making processes as particularly essential for procedural justice [39].

Perhaps the least considered form of equity was recognitional, although it was mentioned or referred to a few times. For example, the Mahmoudi, Lubitow, and Christensen (2019) [76] case study focusing on a bikeway development in Portland described how the traditional top-down planning model used initially to develop the bike path was ahistorical, resulting in a plan that did not recognize and therefore would not benefit historically marginalized neighborhoods. Moreover, in the context of urban agriculture (UA) Stanko and Naylor (2018) [64] say that attempting to promote equity through UA does not address existing or historical injustices, including access to land and other resources and jobs and economic opportunities. Other articles commonly mentioned the importance of including diverse perspectives and inclusive processes in planning as a way to address justice related concerns in sustainability work. In fact, this point is perhaps the most common suggestion from scholars in our review for integrating EJ and sustainability in a meaningful way, and we feel it is a generalizable result of our review.

All in all, our literature review revealed a body of literature that recognizes the importance of EJ considerations within sustainability work, despite the variance in the actual integration of the two concepts. The specificity of approaches for integration in our review, however, may be helpful for scholars in particular disciplines to think about potential EJ considerations in their work. For example, scholars that have tended to focus on distributional aspects of environmental harms may be inspired to consider broadening their scope to also consider investigations of procedural and/or recognitional aspects of justice, as some papers in our review emphasize. This may offer more actionable recommendations to help remedy the distributional harms revealed.

3.3. Research Objective 3: Identifying Knowledge Gaps

Based upon the major themes identified, and the wide range of EJ and sustainability integration observed, we found some gaps in the literature that may inform future work. Perhaps the most obvious gap is that there remains no commonly used or agreed upon
way to integrate EJ and sustainability. It is obvious that a lot of thought and effort has been
devoted to this topic, especially conceptually. Many papers that we reviewed heavily cite
Agyeman and colleagues when referring to the concept of just sustainability and often
stress the importance of an inclusionary, bottom-up decision-making processes to ensure
consideration of justice concerns. However, the scholarly literature is piecemeal in terms of
actual application of just sustainability principles. Despite the many studies included in this
review and elsewhere providing lessons learned from on-the-ground cases, many scholars
indicate that the success of certain planning efforts or initiatives in this space are often
context specific, making the development of general principles of practice more difficult.
Thus, a major focus of future work should be on developing best practices or guiding
principles for scholars and practitioners seeking to better integrate EJ considerations within
sustainability research and practice.

We also found a heavy emphasis on urban agriculture and food related studies in our
literature review. Although some papers on this topic were expected, we were surprised
that other critical resources or services such as drinking water, energy services, and/or
mobility/transportation were not well represented in our review. Although we recognize
that our sample may not be representative of all of the papers in this space, our findings
suggest that more work focusing on the distribution and access to important critical
services and infrastructure may be a ripe area for future just sustainability work, especially
considering the growing emphasis on community resilience to increasing natural and
human-caused disasters.

The final knowledge gap we observed was the lack of studies related to the justice
implications of climate change, climate mitigation, and climate adaptation. These are
undoubtedly growing areas of research with major implications for EJ. Yet our literature
review found scant evidence of these topics. Where climate is mentioned, it is an example
issue and not the focus of the analysis. For example, in Hirsh (2008), climate change
is identified as a common area of concern shared by environmental and social justice
organizations and therefore a topic that offers promise for meaningful integration [83],
and in White-Newsome and colleagues’ (2009) case study, assessing vulnerability to heat
is of growing importance in the context of climate change [85]. The study that most
explicitly addresses climate change justice is Finn and McCormick (2011) where a review
of climate change adaptation and mitigation plans was conducted for evidence of EJ
considerations [69]. Not surprisingly the three plans reviewed in the study revealed an
insufficient consideration for EJ and social equity more broadly.

4. Discussion & Conclusions

Despite much effort and focus on the concept of just sustainability and many scholars
calling for better integration of EJ issues and sustainability, our literature review suggests
that current constructions of environmental sustainability and sustainable development
remain inadequate to meaningfully do so consistently. Our literature review revealed many
examples where the concepts are beginning to come along with mixed success in practice.
Each case study and paper show a variety of methods for approaching the integration,
making it challenging to understand and develop best practices on one hand, while at the
same time showing promise for successful integration of EJ and sustainability for different
types of sustainability scholars. Still, much of this evidence points to barriers in strategically
integrating justice and equity concerns into sustainability scholarship and research, despite
growing theoretical guidance and strong willingness in many cases to do so.

Regardless of the variety of approaches and pathways that the reviewed scholarship
revealed for integrating EJ and sustainability, ultimately, there is a consensus about the
importance of empowering stakeholders and communities to be a part of decision-making,
sustainability planning, and sustainability scholarship to promote more just and equitable
outcomes. The authors view this emphasis as a call for more sustainability scholars who
seek to meaningfully integrate justice and equity considerations into their work to do so
through community-engaged scholarship. Although a wealth of information has been
published on this topic (e.g., [90]), the basic concept is to remove barriers between academic scholarship and more practical research and knowledge for greater social impact. This often involves collaborative work with communities to address jointly defined goals and interests for societal impact and is considered critical to sustainability practice in general [90–93]. While we acknowledge that much local and place-based sustainability work already engages with community stakeholders on a variety of topics, considerations of EJ may require an extension of existing stakeholder engagement efforts focused on including representatives from populations where injustices have occurred and/or organizations whose missions are related to local EJ or broader social equity missions. Even if the focus of sustainability work and/or planning centers on other sustainability goals, such as climate change mitigation or the greening of society, the inclusion of these voices and perspectives can help prevent unintended justice related consequences of well-intentioned initiatives. Without this type of engaged-scholarship, we argue that the meaningful integration of EJ considerations with sustainability science will remain disjointed and lacking in academic scholarship.

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