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Towards a Framework for the Intersection of Environmental Justice and Climate Change

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Abstract

In 1994, the Interagency Working Group on Environmental Justice (EJIWG) was established by Executive Order 12898 to advance environmental justice principles. In 2011 the EJIWG identified climate change as an important area of focus for increased reporting and for joint development of programs with impacted communities. To achieve these goals, a working group came together to develop a framework that articulates the intersection of EJ and climate change, provides a basis for using common terminology to support federal actions, supports the engagement of communities often left out of climate change conversations, and identifies needs and gaps to inform targeted education, communication, and implementation actions. A list of key terms was compiled from across the climate change science and climate justice research and community based work, as well as from community planning. Key questions that guided the development of the framework were: who is most vulnerable to climate change, and how? How does climate change interact with existing environmental justice disparities? How can disparities arising from the added effects of climate change be reduced, and how can opportunities arising from actions to mitigation and adapt to climate change be leveraged to reduce vulnerability? The framework draws on long- and well-established federal environmental justice programs that seek to reduce disparities in environmental impacts, and integrates more recent actions to address the impacts of climate change. It serves the goals of the EJIWG by illustrating how climate change and environmental justice issues interact to contribute to vulnerability, and how adverse outcomes can be minimized and beneficial outcomes maximized. Meaningful involvement of affected communities is a key factor in leading to these desired outcomes through maximizing co-benefits and utilizing equitable development.

Introduction

In 1994, President Clinton's Executive Order 12898 called for federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of programs, policies and activities on low-income and minority communities. The formal recognition that

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environmental hazards have disparate impacts began the federal government's efforts to address the environmental justice concerns of low-income and minority communities. The executive order created the Federal Interagency Working Group on Environmental Justice (EJIWG) to provide "a forum for Federal agencies to collectively advance environmental justice principles" (EJIWG 2016). The IWG works to enhance communication and coordination among agencies and with the public on EJ issues, enhance support of holistic community-based solutions by fostering collaboration, information sharing and leveraging resources, and advance inter-agency strategies to identify and address environmental justice concerns in agency programs, policies, and activities.

As the impacts of climate change have become more apparent, concern has grown that the impacts would fall disproportionately on groups that are already experiencing environmental injustice – those already burdened by the health effects of climate change such as heat waves, and economic hardships (USGCRP 2016). Adaptation and mitigation activities can generate both benefits and costs, with some of those costs having the potential to be unequally borne (Adger 2006). Actions to mitigate or adapt to climate change will need thorough examination to understand their potential to exacerbate environmental and social inequalities in the U.S.

In 2015 the EJIWG created a subcommittee on climate change impacts to support five goals: (1) promoting collaboration across federal agencies and with communities concerned about environmental justice and climate change issues; (2) ensuring vulnerable populations are considered in agencies' climate adaptation activities, and providing information, services, and data to help; (3) making communities more resilient by providing tools, systems, and policies relevant to communities' and businesses' needs to reduce impacts on natural resources and human health due to climate change; (4) ensuring two way communication around climate-change related issues; and (5) implementing the Educate, Motivate & Innovate (EMI) Climate Justice Youth Project.

Given the variety of approaches to climate change and environmental justice that exist among different agencies and civil society, the subcommittee undertook to create a framework that would provide a common approach and language for work at the intersection of environmental justice and climate change. The framework would articulate that intersection in order to illustrate who is most vulnerable to climate change and how, identify opportunities for co-benefits from mitigation and adaptation activities as well as potential adverse impacts of mitigation and adaptation activities on communities experiencing environmental justice issues, and identify needs and gaps to inform targeted education, communication, and implementation actions.

This effort is still a work in progress, and this paper describes accomplishments thus far, including the research that has been undertaken, preliminary findings, and the work yet to be done.

Terminology related to Climate Change and Environmental Justice

As a first step the subcommittee compiled a list of terms commonly used by federal agencies in climate change and environmental justice work. The terms were drawn from materials submitted by working group members including reports from agency research and inter- and intra-governmental groups such as the Intergovernmental Panel on Climate Change and the U.S. Global Change Research

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Program respectively, as well as agency websites and program materials. Academic literature and grey literature were used to supplement the list for terms that were not widely used in the governmental materials or where definitions were found to be inadequate. The criteria for inclusion in the list were that a term should: have broad applicability across federal agencies, sectors and communities; come from the synthetic literature except when an agency definition provides a unique contribution; and explicitly consider the human dimensions of the concept along with the environmental factors.

For many terms, particularly those related to climate change, different definitions were found that reflected the different perspectives or goals of the agencies. For example, “adaptation” was found to have definitions that varied in emphasis from those that mention reducing vulnerability or risk only to those that added the concept of taking advantage of beneficial opportunities.

Example: Varying Definitions of the Term “Adaptation”

U.S. Global Change Research Program – “efforts to reduce the vulnerability of society to climate change impacts.” (USGCRP n.d.)

International Panel on Climate Change (IPCC) Special Report on Extreme Events – “In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.” (IPCC 2013).

U.S. Department of Agriculture, Forest Service – “Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.” (USDA n.d.)

Executive Order 13653 and Presidential Memorandum, Climate Change and National Security - “Adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.” (EO 13653 2013).

Two terms in particular that provoked much discussion were “resilience” and “vulnerability.” The working group felt that it was important to clarify that the traditional definition of resilience used in the field of ecology and natural resource management was not sufficient as it had the connotation of “bouncing back” to an original state. Instead, a new definition was created by adapting definitions used at EPA (U.S. EPA 2017) and academic literature (Leichenko 2011) which emphasized learning and improving as well as recovery. “The ability of individuals and communities to reduce exposure and sensitivity to, and recover and learn from, gradual climatic changes or extreme climate events, in order

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to retain or improve the integrity of infrastructure and economic systems, vital environmental services and resources, the health and welfare of people and communities, and the flexibility and diversity of institutional and governance structures.”

The term vulnerability also provoked discussion because, while it is widely used, it has different meanings and connotations across some disciplinary fields. In scientific fields vulnerability is a key concept for understanding how human or natural systems are impacted by climate change. However, several working group members encountered concerns from community members about being labelled as “vulnerable,” signaling a perception that the word was disempowering. Therefore, the group decided to adopt the following note to the use of the term vulnerability.

“We acknowledge communities’ desire and right to determine how they are referred to, and that many reject the label of ‘vulnerable.’ We also acknowledge that vulnerability is a key concept in the science of understanding how climate change affects systems and communities, particularly in identifying disparities in impacts and in the ability to prepare, adapt and recover, as well as measures to reduce those disparities. Therefore, we suggest that the concept of vulnerability should play a role in the framework, but that it will not be used to designate particular communities or groups of people as ‘vulnerable.’ Rather, the framework will focus on enhancing adaptive capacity and resilience.”

The list of climate change and environmental justice terminology remains a working list that can be revised or added to as needed. Compiling the list was a useful exercise to elicit different perspectives of the working group members and provide a basis for common language in the next phase of work, drafting the framework.

Towards a framework for the intersection of environmental justice and climate change

The working group articulated the following goals and desired characteristics for the framework: “A top-level conceptual and process diagram that provides a framework that can be used by any federal agency or inter-agency initiative to consider how climate justice can be incorporated into its work.” It should be parsimonious and relatively easy to digest, and apply a holistic approach. It should be able to be used by agencies who want to ensure their climate change related activities, such as grant making, risk management, developing policy, or conducting research, properly consider environmental justice. The framework would be based on the EPA’s definition of environmental justice, “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” (EPA 2016a), as it includes distributive and procedural/process dimensions of justice.

Currently the approaches to environmental justice span a wide variety of federal activities. At EPA progress has been made incorporating environmental justice analyses into regulatory activities including rulemaking, permitting, and enforcement, and in developing the science to support assessment of disparate impacts and cumulative impacts (EPA 2016a, EPA 2016b). EPA, HHS, DOT and others are doing more to promote equitable development to address current and potential future environmental justice issues (DOT 2017, EPA 2016c, HHS 2017). In addition to addressing disparate

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impacts of environmental hazards, agencies have been working to improve fairness in distribution of environmental goods, such as access to nature. This concept of fairness of distribution has been receiving attention at several agencies including EPA, USDA, and the National Park Service (EPA 2016c, Jennings et al. 2012, Richardson 2017).

Developing the framework began with looking at existing frameworks for climate change used by agencies and in the literature. We undertook a literature review for insights into guiding questions: who is most vulnerable to climate change, and how? How does climate change interact with existing environmental justice disparities? How can disparities arising from the added effects of climate change be reduced, and how can opportunities arising from actions to mitigate and adapt to climate change be leveraged to reduce vulnerability?

Who is most vulnerable to climate change and how?

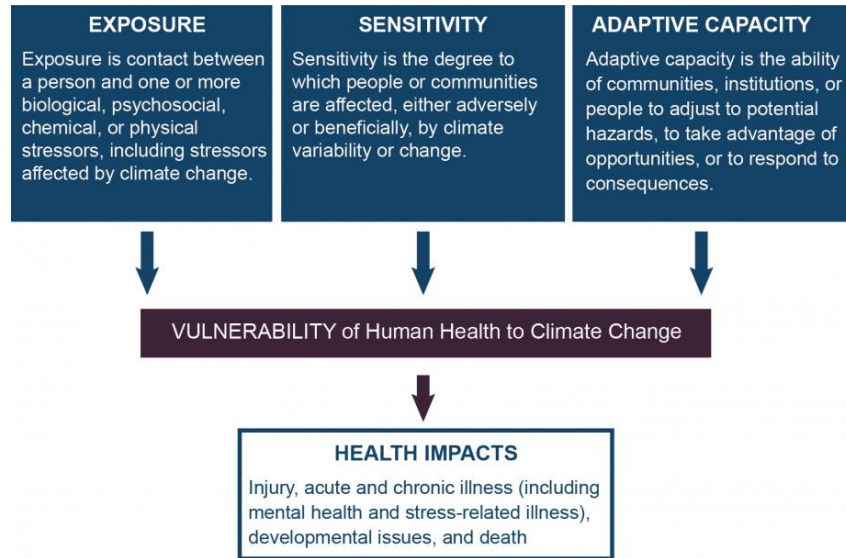
Vulnerability is a key concept in climate change research. It is the starting point for understanding how human and natural systems will be affected by the changing climate and its impacts, including changes in extreme weather, accelerated sea level rise, increases in duration of droughts, etc. and what can be done to minimize the impacts. Researchers who study hazards and disasters have identified characteristics that tend to be associated with greater vulnerability, such as age, income, gender, race, disability, immigrant status, and political marginalization (Peacock, Morrow and Gladwin 1997; Finch, Emrich and Cutter 2008), as well as processes that produce vulnerability, such as colonialism and globalization, historical land use patterns, infrastructure development, and segregation (Watts 1983, Dooling and Simon 2012, Fischetti 2001; Brunkard, Namulanda and Ratard 2008).

As recognition of the social factors of vulnerability to disasters has grown, so have efforts to define and measure vulnerability in order to identify potentially vulnerable places and communities and implement mitigation activities. The Social Vulnerability Index developed by Susan Cutter and colleagues remains perhaps the most well-known and widely replicated effort. It consists of a model that combines biophysical and social indicators to assess vulnerability in a local area (Cutter, Mitchell and Scott 2000, Cutter 1996). However, by Cutter's own admission, the model fails to take into account "the root causes of the antecedent social vulnerability, larger contexts, and post-disaster impact and recovery" (Cutter et al. 2008, 601), factors which are critically important if the model is to be used for assessing and ultimately reducing vulnerability. Dissatisfaction with such models has led researchers to focus increasingly on the concept of resilience, developing models that incorporate temporal dynamics, social learning in the form of preparedness and mitigation, and the interactions between natural systems, social systems, and the built environment (Turner et al. 2003, Cutter et al. 2008, U.S. EPA 2017).

Nevertheless, vulnerability remains a popular framework, particularly among practitioners and those who seek to plan for and implement climate adaptation actions. The USGCRP report *The Impacts of Climate Change on Human Health* defined vulnerability as the interaction of three areas of determinants: exposure, sensitivity, and adaptive capacity (images below). Each determinant consists of identifiable and quantifiable factors, which together can be used to measure relative vulnerability of a population to the health impacts of climate change. In this formulation, social vulnerability factors such as age, income, and race influence vulnerability in all three determinants. For example, poverty

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contributes to exposure in that people in poor neighborhoods are more likely to be exposed to environmental health threats; it contributes to sensitivity in that poor people are more likely to have underlying health disparities; and it is a factor in adaptive capacity in that lack of resources is a hindrance to adaptation.



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Intersection of Social Determinants of Health and Vulnerability

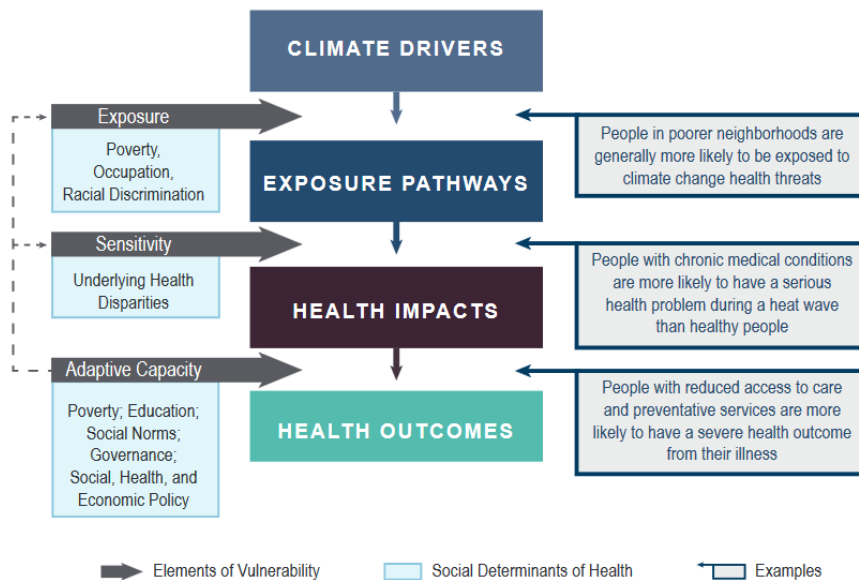


Figure 2: Social determinants of health interact with the three elements of vulnerability. The left side boxes provide examples of social determinants of health associated with each of the elements of vulnerability. Increased exposure, increased sensitivity and reduced adaptive capacity all affect vulnerability at different points in the causal chain from climate drivers to health outcomes (middle boxes). Adaptive capacity can influence exposure and sensitivity and also can influence the resilience of individuals or populations experiencing health impacts by influencing access to care and preventive services. The right side boxes provide illustrative examples of the implications of social determinants on increased exposure, increased sensitivity, and reduced adaptive capacity.

USGCRP 2016.

How does climate change interact with existing environmental justice disparities?

Researchers have found that the distribution of environmental hazards is unequal. Communities of color and low-income communities are more likely to live near polluting facilities and to experience health disparities due to environmental exposures (Konisky 2015). Climate change is expected to exacerbate these disparities (Adger et al. 2006, Angeulovski and Roberts 2011). For example, communities of color and low-income communities are more likely to live near hot spots of air pollution such as particulate matter or toxic sites, and therefore are exposed to relatively greater levels of pollution (e.g., Bell and Ebisu, 2012; Gochfeld and Burger, 2011). Increasing temperatures will exacerbate the health effects of poor air quality, such as asthma and heart disease (USGCRP 2016).

Climate change also increases communities' existing vulnerability to disasters, a fact brought into relief by Hurricane Katrina. Because of historical land use patterns, infrastructure development, and segregation certain communities are already more vulnerable than others to disasters. With climate change, the risk is amplified, increasing the exposure of low-income people and communities of color to impacts such as flooding, and limiting their ability to respond and recover (Finch et al., Fischetti 2001; Brunkard, Namulanda and Ratard 2008).

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Equally important to distribution of environmental impacts are the processes which lead to disparities such as the unequal or negligent enforcement of laws and protections from environmental hazards (Bullard 2000). Some research has indicated that communities undergoing rapid demographic transition in their ethnic and racial composition are more vulnerable to having toxic sites located in the community, providing further evidence of the importance of involvement by communities in siting processes, and suggesting that social cohesion and social capital are important factors in the ability of a community to effectively participate (Pastor et al. 2005).

Not only are the impacts of climate change important, but also the mitigation and adaptation actions that can negatively affect communities. Communities with existing environmental justice concerns have expressed concern about climate mitigation activities such as cap and trade programs that may have unequal impacts on communities already experiencing significant air pollution (Schlosberg and Collins 2014). Their concerns further highlight the importance of meaningful involvement in decision making and bring new significance to the way in which climate change decisions are made. Bullard notes, "It is not possible to build equity into adaptation and mitigation planning without taking into account the history of these communities. Policy and plans should begin by understanding why people become vulnerable in the first place." (Bullard et al. 2016)

How can disparities arising from the added effects of climate change be reduced, and how can opportunities arising from actions to mitigate and adapt to climate change be leveraged to reduce vulnerability?

In identifying ways to reducing environmental justice disparities from the added effects of climate change, as well as opportunities arising from mitigation and adaptation actions, we focused on three main avenues: increasing adaptive capacity, equitable development, and co-benefits. While there is much overlap in these concepts, they occupy different places in the framework. Adaptive capacity is a component of vulnerability. Co-benefits have the potential to increase adaptive capacity or to reduce the other dimensions of vulnerability. Equitable development is an approach to planning and development that emphasizes equity, and therefore has the potential to address root causes of vulnerability such as poverty, exclusion, and health disparities.

Adaptive capacity - Adaptive capacity is defined by the IPCC as: "The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities" (IPCC 2015). Some of the many factors affecting adaptive capacity include socioeconomic status, human and social capital, institutional resources, changes in the private sphere (e.g. family relations, single households), health care provision, mobility, and flexibility (Carter et al. 2016, O'Brien and Leichenko 2007, USGCRP 2016). Cultural practice also plays an important role in supporting shared experiences and social capital (Schlosberg and Collins 2014), and in increasing the empowerment of communities to lead in designing and implementing climate adaptation measures (Berry et al. 2010). Schlosberg and Collins (2014) note that, "Increasingly, the idea of building adaptive capacity to develop more just communities is common across environmental justice groups engaged in climate issues."

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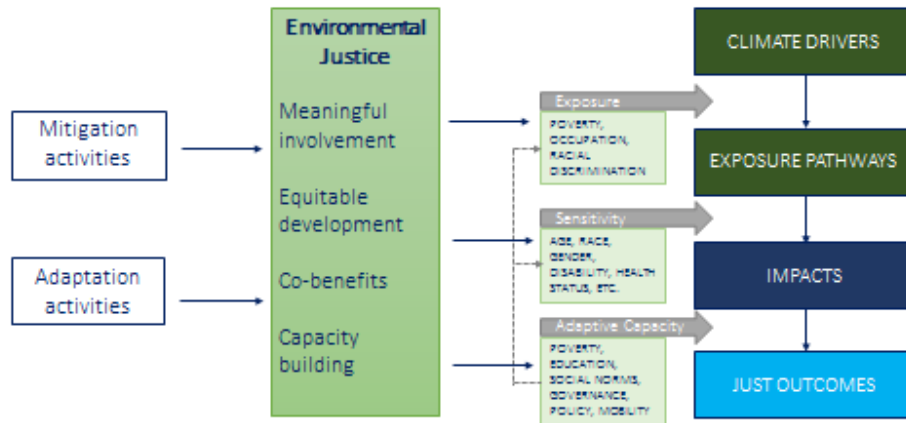
Co-benefits - Climate adaptation and mitigation actions that are not directly related to the reduction of climate change impacts but “are favorable to human welfare” are termed co-benefits (Nehmet et al. 2010). These can include human health, social capital, macro-economic, geo-political, ecosystem, agricultural yields, and employment patterns. One example of creating co-benefits from adaptation is a weatherization program to replace old windows and doors in order to save energy, and at the same time remove sources of lead paint from older homes. The program created additional co-benefits by training residents to get jobs doing the weatherization work (Schlosberg and Collins 2014). Some research indicates that co-benefits are maximized when adaptation is done in a culturally sensitive way, resulting in better health for indigenous people (Berry et al. 2010).

Equitable development - Urban planning offers many opportunities for addressing past environmental injustices and future climate vulnerability. “From the post-Sandy discussions of the environmental justice movement in New York, through the broader C40 Cities movement, ideas of sustainable design, climate adaptation, and justice are being integrated into urban planning” (Schlosberg and Collins 2014). EPA promotes equitable development in order to harness the benefits of planning for disadvantaged communities. Equitable development “draws on both environmental justice and smart growth and generally refers to a range of approaches for creating communities and regions where residents of all incomes, races, and ethnicities participate in and benefit from decisions that shape the places where they live.” It emphasizes the integration of “people-focused strategies” that support community residents with place-focused strategies that stabilize and improve the neighborhood environment (EPA N.d.). People-focused strategies include strategies to improve health, provide job opportunities, and empower communities to participate and make their voices heard in planning processes.

The term “climate justice” is not commonly used in the federal government, and no definitions were found in governmental materials. The use of the term here is intended to signify the intersection of environmental justice and climate change as the core concerns of the working group, but is not intended to create a new definition of climate justice. The draft framework proposed below brings together key concepts from the questions posed above in order to illustrate this intersection.

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A Climate Justice Framework: Reducing vulnerability to climate change through environmental justice



The framework illustrates how vulnerability to climate change may be reduced by addressing environmental justice issues through meaningful involvement of affected communities in mitigation and adaptation actions. Meaningful involvement is a core component of the EPA’s definition of environmental justice, reflecting the idea that “individuals should have an opportunity to participate in government decision about any activity that may result in such harms and risks to them” (Konisky 2015). In addition, a wide body of research has shown that involvement of community members in planning processes, including adaptive management, improves outcomes and builds capacity (Camacho 2005, Adger 2010). By involving community members in planning and implementation of mitigation and adaptation activities, opportunities for co-benefits and equitable development are more likely to be identified and acted upon. This makes meaningful involvement a key component of planning mitigation and adaptation activities for reducing negative consequences that can exacerbate exposure or sensitivity, and harnessing opportunities for reducing exposure and sensitivity and increasing adaptive capacity. Indeed the IPCC definition of co-benefits notes that “co-benefits are often subject to uncertainty and depend on local circumstances and implementation practices” (IPCC-AR5). Without meaningful involvement of affected community members, opportunities for co-benefits are likely to be missed.

Conclusion

In articulating the intersection of environmental justice and climate change, we have focused on the key activities of climate change work: mitigation and adaptation, and how they might be implemented so as to minimize adverse outcomes and maximize beneficial outcomes in terms of

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reducing vulnerability. We have argued that meaningful involvement is a key factor in leading to these desired outcomes, through utilization of co-benefits and equitable development in particular. This approach draws on long and well-established federal environmental justice programs that seek to reduce disparities in environmental impacts, and integrates more recent actions to address the impacts of climate change. The framework serves the goals of the EJIWG by illustrating how climate change and environmental justice issues interact to contribute to vulnerability, and the opportunities that exist for reducing vulnerability through addressing environmental justice issues.

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