



SUMMARY OF OUR GREEN/DUWAMISH STAKEHOLDER ENGAGEMENT

Attachment 4: Synthesis Cards

biodiversity

in the green duwamish watershed



BACKGROUND

The Green Duwamish watershed is home to an impressive array of wildlife species. Their varieties include marine, intertidal, and freshwater aquatic species living and traveling within and between important habitat from the highly modified Duwamish Estuary to the upper reaches of the Green River. The watershed is also home to birds of prey, charismatic mammals, and a stunning palette of plants, fungi, old growth trees, and much more. The landscapes that provide food and shelter to many of these varied species are actively conserved, protected, and restored through the actions of numerous government agencies, non-profits, community groups, and individuals.

In spite of these many concerted efforts, habitat within the watershed is threatened by urban development, invasive species, and climate change, among other factors. As a result, historically abundant aquatic species such as Chinook salmon and steelhead, for instance, have been declared endangered as a result of decades of habitat degradation. Increases in water temperature, changes to water quality, and modifications to river morphology have made the Green and Duwamish Rivers and their tributaries less hospitable to the aquatic life that once thrived there.

Terrestrial plants and animals face similar stresses in the watershed due primarily to the combined effects of historic resource extraction (agriculture, mining, timber, etc.), expansion of urban development, and dramatic modifications to the landscape. Additional threats to species viability within the watershed include historic and continued contamination of air, land, and water from industry, transportation, and other activities.

PRIMARY INDICATORS

- Habitat Extent & Quality
- Food Sources
- Water Quality
- Air Quality
- Degree of Predation
- Degree of Extraction

KEY PLANS / PROGRAMS

EPA Record of Decision for Lower Duwamish Waterway Superfund Site - "To be protective of human health and the environment," the cleanup will involve 7 years of construction, with contaminant concentrations in fish to be achieved 17 years after the start of construction.

Floodplains by Design (DOE +TNC + PSP) - Capital projects grant program for flood protection and habitat protection to reduce flood risk to people and property.

Puget Sound Action Agenda (PSP) - "The Action Agenda is driven by six goals mandated by the Washington State Legislature to restore the health of the Puget Sound by 2020." Outcomes are measured in acres of estuarine habitat restored and net miles of shoreline armoring removed.

Near Term Actions for South Central Action Area (PSP) - Specific recommendations for the PSP South Central Action Area. Multiple targets to reach by 2020, including acquiring, protecting, and restoring floodplain, riparian, and habitat areas and implementing stormwater retrofit projects.

King Conservation District 2015 Program of Work - Special district working to promote the sustainable use of natural resources through responsible stewardship. Outcomes are measured in forest area planted, stewarded, and farmers recruited to actively steward their properties.

King County Open Space Plan: Parks, Trails, and Natural Areas - A 5-year plan to enhance regional quality of life through stewardship of parks, trails and public open space, including acquisition, stewardship, and conservation of natural areas and working resource lands.

System-Wide Improvement Framework (KC) - Focused on the Lower Green River, the "SWIF is a Corps-sanctioned process to achieve flood protection solutions that satisfy the multiple and often competing federal mandates and legal requirements that apply to levee systems."

Salmon Habitat Recovery Plan (WRIA 9) - A long-range plan to "protect, rehabilitate and enhance habitat to support viable salmonid populations in response to the Endangered Species Act listing of Chinook salmon and bull trout using an ecosystem approach." Target summer/fall spawning counts of Chinook should fall between 17,000 and 37,000.

KEY PLANS / PROGRAMS (cont'd)

Cascade Agenda (Forterra) - Land conservation planning to "maintain forests, protect fresh water and marine ecosystems, farms and the farming business preserved as permanent elements of the landscape and way of life, provide parks and recreation in all neighborhoods," with a goal of conserving 1.3 million acres of forest and farmland in the State by 2105.

Green Cities Program (Forterra) - Partnership initiative between Forterra and collaborating cities to bring about healthy city parks and green spaces free of invasive plant species. In Seattle and Kent, there is a current effort to restore all 2,500 and 1,189 acres respectively of forested park lands.

Shoreline Master Programs (All Jurisdictions) - State-mandated shoreline planning to prevent inherent harm of an uncoordinated piecemeal approach to development of the state's shorelines. Updated every 8 years.

KEY CHALLENGES & OPPORTUNITIES

Challenges:

- The long term viability of terrestrial and aquatic species is threatened in the watershed primarily because of urban development, climate change, and invasive species
- Threats to biodiversity are not well understood by the public, and the actions underway to address biodiversity are not coordinated at a watershed scale
- Funds available are not sufficient to meet habitat restoration and conservation targets

Opportunities:

- Watershed-wide information exchanges and coordination of projects could facilitate funding and actions to meet habitat preservation and restoration targets
- Expediting conservation and restoration projects in key tributary basins could promote revitalization of main stem Green and Duwamish Rivers
- Planning and coordinating for improved stormwater and flood management in the watershed could yield improved habitat along with economic benefits and increased community well-being

climate change

in the green duwamish watershed



BACKGROUND

While scientists have a strong understanding of how climate change is likely to affect the broader world, conditions are more uncertain when considering impacts at the watershed or even regional scale. What is known is that climate change is an important issue that will affect environmental, social, and economic conditions in the Green Duwamish watershed and greater Puget Sound.

Surface Air Temperatures and Extremes

Temperatures in Pacific Northwest states are expected to rise by 3 - 10°F, on average, by the end of the century.¹ Changes may vary significantly by geographic location and season, with the greatest temperature increases expected during summers.² In the Puget Sound region, models expect increases of 2°F by 2020, 3.2°F by 2040, and 5.3°F by 2080, compared to 1970-1999 levels.³ The region will experience more extreme temperature days (heat waves) throughout the year that will work to exacerbate other temperature related issues such as Urban Heat Islands (UHIs). Already in 2014, the City of Seattle had one of the worst UHI temperature differentials in the United States, with temperatures in the urban core reaching up to 17°F hotter than nearby rural areas.⁴ This is expected to worsen as suburban areas within the region become more urbanized due to population growth.

Average Precipitation and Extremes

Changes in annual and seasonal precipitation will continue to be primarily driven by year-to-year variations rather than long-term trends in the region, but heavy rainfall events are projected to become more severe.² There will also be extreme seasonal variability with estimated decreases in summer precipitation levels, and increases in fall and winter precipitation. Changing precipitation patterns will likely lead to both increased flooding and drought days in the region. Coupled with increased temperatures overall in the region, changes in precipitation are expected to decrease the snowpack in Washington's mountain ranges as more precipitation falls as rain instead of snow. It is expected that by the end of the 21st century, all of the watersheds within Washington State, except the North Cascades, will be fed primarily by rainfall as opposed to a snowfall or a mixture of the two.⁵

¹ Climate Impacts Group, 2013

² US FWS, 2011

³ US FWS, 2011

⁴ Climate Central, 2014

⁵ College of the Environment, 2015

BACKGROUND (cont'd)

Snowmelt and Streamflow Timing

Changes in volume, timing, and types of precipitation will play a significant role in the availability of water. It is expected that lower elevations will experience more flooding, while higher elevation snowmelt-fed basin systems could see increased drought frequency. Overall, low stream flows during the summer months are predicted to become even lower, and the waters will become warmer, negatively impacting the long-term viability of aquatic species such as salmon. Low flow will also decrease the amount of water available in the region for agricultural, domestic, and recreational uses. The Green River is already seeing low summer flows that no longer allow recreational boating in places that were previously well-used.²

Sea Level Rise and Ocean Acidification

Sea levels within the Puget Sound region are expected to rise between 13 and 50 inches by 2100. In addition, the world's oceans have absorbed 127 billion metric tons of carbon dioxide since the industrial revolution, lowering overall pH by 0.1. Temperature increases coupled with rising sea levels and acidifying oceans will put pressure on infrastructure and ecosystems not adapted to the warmer, flooded, and acidic environments. These changes may create inhospitable living and working environments for people, as well as declining habitat for native species.

PRIMARY INDICATORS

- Surface Air Temperature & Extremes
- Average Precipitation & Extremes
- Mountain Snowpack
- Snowmelt and Streamflow Timing
- Sea Level
- Ocean pH
- Timing of Ecological Events
- Geographic Range of Plants and Animals
- Composition of Ecological Communities
- Air Quality

KEY PLANS / PROGRAMS

PSCAA Strategic Plan - "Protect public health, improve neighborhood air quality." PSRC planning area jurisdictions pay per capita into this emissions reduction program, with a 2020 target for reducing the annual economic impact of air pollution (AP) health effects by \$300 million; reducing cancer risk from AP by 50%; reducing greenhouse gas emissions to 1990 levels; along with several other targets.

Strategic Climate Action Plan (KC) - A climate change adaptation and mitigation plan aimed at reducing greenhouse gas emissions and preparing for the impacts of climate change. Emissions reduction targets county-wide, relative to a 2007 baseline: 25% (by 2020), 50% (2030), 80% (2050).

Climate Action Plan (Seattle) - A plan to reduce greenhouse gas emissions and improve quality of life in the city, with multiple phased targets, to include increases in bicycling, electric cars, and housing and job availability within urban centers/villages.

KEY CHALLENGES & OPPORTUNITIES

Challenges:

- Greenhouse gas emissions continue to increase, contributing to climate change
- Climate-driven flooding, storm surge, and precipitation changes will adversely affect livability within the watershed and disrupt industry
- Anticipated temperature increases and more extreme weather events will tax the resources and health of people and ecosystems in the watershed

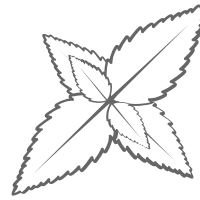
Opportunities:

- Pursue management of stormwater, flooding, and storm surge comprehensively, as an interconnected system
- Advance efforts to increase tree canopy and other types of vegetation that can decrease heat effects in developed areas and help reduce potential impacts of extreme weather (runoff, flooding, etc.) everywhere
- Prioritize and facilitate local reduction of greenhouse gases by reducing emissions and increasing carbon sequestration

Share
Connect
Thrive

human health

in the green duwamish watershed



BACKGROUND

Environments in which people live, work, and play matter for their health. Physical factors like air, land, water, building conditions, and social factors like community cohesion, political power, and economic conditions, help determine overall well-being. Such aspects of the human environment contribute to health disparities known to affect populations in King County. People of color, those with Limited English Proficiency, and those with low incomes persistently face health inequities. To address this problem, King County and The Seattle Foundation launched the Communities of Opportunity Initiative to identify and improve community features that shape well-being. Under the Initiative, 20% of County census tracts that rank lowest on an index including life expectancy, disease, housing quality, and economic opportunity have been prioritized as Communities of Opportunity (COO). In the Green Duwamish watershed, most of these priority communities are in the Nearshore, Duwamish Estuary, and Lower Green sub-basins. Some watershed-specific health concerns are summarized below.

- Life expectancy at birth varies widely across the watershed, ranging from 76.6 years in S Auburn and 79.7 years in E Kent, to 84.1 years in Seattle's Magnolia/Queen Anne area.
- Higher rates of low birth weight deliveries (6.8 to 7.7 babies per 100 births) are reported for Seattle's Downtown and North Highline areas, SeaTac/Tukwila, S Renton, Kent (West and Southeast), and N Auburn.
- Much of the Lower Green River subwatershed sees the high death rates from both heart disease and diabetes.
- The childhood asthma hospitalization rate in Seattle's South Park/Georgetown/Beacon Hill area is 328 per 100,000 residents, higher than Seattle overall (212 per 100,000) and King County overall (137 per 100,000).
- Areas including Burien, S Renton, Kent, E Federal Way, S Auburn, Covington/Maple Valley, and Enumclaw/Black Diamond/SE King County have high percentages of obese adults (29.3 to 42.7%). Almost half of the adults in E Federal Way (42.7%) and S Auburn (40%) report being obese, and 55% of adults in Seattle's ZIP code 98108 are overweight or obese, higher than Seattle overall (48%).
- Areas of the watershed with high percentages of adults reporting frequent mental distress (11.8 to 16.2%) and poor mental health (11.9 to 16.7%) include Seattle's Downtown and South Park/Georgetown/Beacon Hill areas, Burien, South Renton, Kent, Federal Way's Central/Military Road area, and South Auburn.

BACKGROUND (cont'd)

- King County's Local Food Initiative reports that only 12% of County adults, and 26% of middle- and high school-age youth, consume recommended amounts of fruits and vegetables. In recent community reports (including South Seattle, Delridge and Auburn), affordability- more than transportation or store proximity- was commonly cited as a barrier to healthy eating.

PRIMARY INDICATORS

Environmental Conditions

- Contaminated Land
- Food Health & Safety
- Shelter
- Outdoor Air Pollution
- Access to Physical Activity
- Potable Water Quality & Supply

Human Health Conditions

- Life Expectancy
- Respiratory Illness
- Overweight & Obesity
- Mental Health
- Poverty
- Birth Weight

KEY PLANS / PROGRAMS

EPA Record of Decision for Lower Duwamish Waterway Superfund Site - "To be protective of human health and the environment," the cleanup will involve 7 years of construction, with contaminant concentrations in fish to be achieved 17 years after the start of construction.

Washington State Action Plan to Eliminate Health Disparities

- Statewide initiative to eliminate negative health outcomes correlated with race, culture, and income. Targets include increasing access to health services, reducing health disparities, and reducing poverty and its impacts on health disparities.

NPDES - TMDL Water Quality Improvement Projects (EPA + DOE)

- National program requiring compliance by each municipality discharging to waterbodies, such that they meet Clean Water Act standards for water quality - "requires that all states restore their waters to be 'fishable and swimmable.'"

Regional Trails Needs Report (KC) - Comprehensive inventory of projects within King County's trail network, identifying current and priority improvements.

Flood Hazard Mitigation Plan (KC) - Ongoing program providing flood hazard services that help reduce public safety risks. Implemented by the King County Flood Control District, with a capital budget of \$18.6 M for the Green River Basin in 2015, focusing on levees, revetments, and acquisitions.

KEY PLANS / PROGRAMS (cont'd)

Local Food Initiative (KC) - "Expand our local food economy to ensure job growth and economic viability for King County food businesses and farms" and "improve access to healthy, affordable food in low-income communities." This initiative aims to meet these goals within ten years (2014 - 2024), with actions aimed at expanding local food production, increasing demand for local food, reducing food waste, among others.

Healthy River / Healthy Communities Project (DRCC) - Aims to implement aspects of the Lower Duwamish Waterway Superfund Cleanup Health Impact Assessment, Cumulative Health Impact Assessment, and Duwamish Valley Vision, with green space, jobs, and alternatives to contaminated fish.

KEY CHALLENGES & OPPORTUNITIES

Challenges:

- Polluted air, land, and water may adversely influence health in the watershed, particularly in the Duwamish Estuary and Lower Green sub-basins
- Healthful subsistence fishing can be a challenge in the watershed where seafood consumption advisories apply due to chemical contamination of certain species in Puget Sound, Elliott Bay and the Lower Duwamish River
- Access to affordable, healthy foods is limited in some areas of the watershed
- Some developed areas of the watershed lack sufficient walkability, open space, trails, and recreational opportunities that can be important assets for healthy living

Opportunities:

- Explore land use planning and other strategic interventions to yield cleaner air, land, and water resources
- Investigate opportunities to increase public access to healthful fishing, particularly along Puget Sound in South King County and possible fishing ponds in the Duwamish Estuary
- Align efforts with the Local Food Initiative to increase urban agricultural opportunities in priority communities, and engage diverse stakeholders to learn about opportunities and barriers regarding hunting, foraging, and fishing as strategies to increase food security
- Support implementation of local and regional bicycle and pedestrian plans, planned trail connections, open space investments, and other recreational opportunities, to provide access to nature and physical activity

social equity

in the green duwamish watershed



BACKGROUND

Differences in well-being that advantage some individuals or groups over others are inequities. Environmental inequities may occur when people of color or low-income populations disproportionately live in unhealthy, ecologically damaged areas. Such inequities are not random. They are systemic and patterned, resulting from past and current decisions, systems of power and privilege, and policies and their implementation.

Though the Puget Sound region is growing and becoming more prosperous, many new and longtime residents are not sharing in the prosperity. Further, this pattern of disparity follows racial and economic lines. In the last decade, growth among communities of color contributed more than 90 percent to population growth in the Puget Sound region, with immigrants accounting for approximately 40 percent of that growth. Within King County, demographics indicate that people of color, those with low income, and those with low educational attainment are more likely to reside in the Green Duwamish watershed than in other parts of the County. Members of these communities within the watershed have limited access to decision-making processes, and exhibit poorer health outcomes and lower life expectancies than those in other local communities. Such social and physical circumstances, and access to resources and opportunity, may propagate through generations and perpetuate an inequitable ability to enjoy the quality of life that the Puget Sound region so prides itself on.

As one example of local environmental inequity on the county scale, affluent neighborhoods in King County have almost twice the amount of robust park access (variety in park size and travel distance) as areas with a higher concentration of people of color, limited English proficiency, and low-income households. Lack of access to such open space resources restricts the associated mental and physical health benefits for community members, thus inhibiting well-being and potentially constraining productive social and political engagement.

DETERMINANTS OF EQUITY

- Education & Early Childhood Development
- Jobs, Job Training, & Community Development
- Health and Human Services
- Food Systems
- Parks and Natural Resources
- Built and Natural Environment
- Transportation
- Affordable & Quality Housing
- Community and Public Safety
- Civic Participation
- Digital Access

KEY PLANS / PROGRAMS

Puget Sound Clean Air Agency (PSCAA) Highly Impacted Communities - Report to inform implementation of PSCAA's Strategic Plan, by identifying communities within the PSRC planning area that bear disproportionate burdens of air pollution.

Communities of Opportunity (KC & Seattle Foundation)

- A grant-making initiative helping community agencies address health and income disparities. Aimed at achieving "a measurable closing of the gap in a cross-section of highly significant economic, social, and health indicators." Goals for 2018 focus on housing, jobs, safety, and health.

King County Equity and Social Justice Strategic Plan - "Will impact lives and change inequities by focusing on institutional policies, practices and systems; and serve as a blueprint for change and a dynamic action plan for achieving greater institutional and regional equity and social justice."

Equity and Environment Initiative (Seattle) - Environmental justice initiative to ensure that all people benefit from Seattle's environmental progress, by engaging highly impacted communities in planning processes, and ensuring mainstream environmental movement leadership opportunities for people of color, immigrants, refugees, people with low incomes, and limited-English proficiency individuals.

Race and Social Justice Initiative (Seattle) - City initiative to address racial equity in economic and health outcomes. By 2017, the city will ensure racial equity in city programs, work with community organizations toward ending structural racism, and help lead networks for racial equity. Emphasis on job training, outreach, education, and contracting with Women and Minority Owned Businesses.

KEY PLANS / PROGRAMS (cont'd)

Duwamish Community Action for Clean Air (DRCC) - Partnership project to improve health outcomes among Lower Duwamish River Valley communities, by improving communities' understanding of air pollution sources, reducing exposure to diesel particulate, and reducing the frequency and severity of asthma attacks among local residents.

Duwamish Valley Vision (DRCC) - Community engagement and green space planning to inform upcoming planning processes that impact Lower Duwamish River Valley communities.

South Park Green Space Vision Plan (SPF) - Community engagement and green space planning to "Identify priorities for improved parks, trails, open spaces and recreational facilities in South Park."

KEY CHALLENGES & OPPORTUNITIES

Challenges:

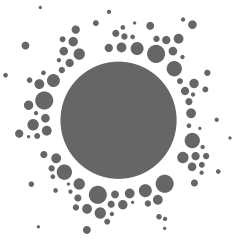
- People of color, low income, and limited English proficiency living in the watershed are less likely to enjoy the prosperity of our thriving region, in the form of health and access to economic opportunity
- These same populations are less likely to be part of decision-making processes that further impact health and economic conditions
- These inequities are structural, unjustly inherited from social and political systemic failures, and require specific action in order to be reversed

Opportunities:

- Advance initiatives to ensure that people of color, low income, and limited English proficiency are leading decision-making processes, particularly those that impact their health and well-being
- Prioritize open space planning for highly impacted communities in a way that increases access to beneficial resources without promoting gentrification or displacement

economic development

in the green duwamish watershed



BACKGROUND

The Green Duwamish watershed is home to the industrial core of the Puget Sound Region. Goods and services produced here reach local and global customers, and all scales in between. In the Green Duwamish, the Pacific Northwest's most active international seaport and airport, Fortune 500 companies and their facilities (Amazon, Boeing, Costco, Starbucks), myriad innovative small businesses, the second largest warehousing district on the west coast, and abundant natural resources, feed thriving commercial productivity. The Lower Green River Valley alone contributes 1/8th of Washington State's GDP.

The diverse employment sectors in the Green Duwamish watershed include manufacturing, agriculture, aerospace, outdoor recreation/tourism, transportation, and other Port related activities. As such, the watershed is an economic engine for the region and employs hundreds of thousands of residents. The watershed also boasts a highly educated and entrepreneurial workforce that is both homegrown and drawn to the region from around the world.

Woven through the watershed's commercial and industrial landscapes are sensitive natural resources, crucial habitat for threatened species, and diverse human ecosystems rich with culture, yet facing challenging economic and health conditions. The juxtaposition places the watershed squarely in the middle of a debate regarding economic, environmental, and social vitality. Along with King County, the watershed's economy is expected to continue to grow over the next 10 years. However, the quality and sustainability of such growth are at risk if measures are not taken to address environmental harms, mitigate climate change effects, advance workforce training, and ameliorate economic and health inequities in communities that fuel the local economy.

PRIMARY FACTORS

- Unemployment Rate
- Job Growth Projections
- Business Income
- Business Start-ups and Closures
- Educational Attainment
- Income Distribution
- Cost of Living

KEY PLANS / PROGRAMS

NPDES – TMDL Water Quality Improvement Projects (EPA + DOE) - National program requiring compliance by municipalities and businesses discharging to waterbodies. Compliance requires that each municipality or company meet Clean Water Act standards for water quality. "Requires that all states restore their waters to be 'fishable and swimmable.'"

PSRC Regional Economic Strategy - PSRC convened the Prosperity Partnership, a coalition of more than 300 government, business, labor, and community organizations dedicated to improving long-term economic prosperity for the central Puget Sound region. Priority actions include those that promote job growth, entrepreneurship, technology innovation, environmental stewardship, vibrant communities, and a high quality of life for all.

Vision 2040 (PSRC) - A 30-year plan to "protect the environment, support and create vibrant, livable, and healthy communities, offer economic opportunities for all, provide safe and efficient mobility, and use our resources wisely and efficiently."

Growing Transit Communities (PSRC) - Land use, transportation, and growth management strategy serving as an implementation element of Vision 2040. Intended outcomes include channeling population growth within existing urban areas; especially in compact, walkable communities that are linked by transit.

King County Jobs Initiative - This initiative provides job training for low-income individuals and communities. The intended outcome is for low-income adults to prepare for, find, and keep living-wage jobs, particularly in fields that have the most potential for wage growth.

System-Wide Improvement Framework (KC) - Focused on the Lower Green River, the "SWIF is a Corps-sanctioned process to achieve flood protection solutions that satisfy the multiple and often competing federal mandates and legal requirements that apply to levee systems."

Flood Hazard Mitigation Plan (KC) - Ongoing program providing flood hazard services that help reduce public safety risks. Implemented by the King County Flood Control District with a capital budget of \$18.6 M for the Green River Basin in 2015, and focusing on levees, revetments, and acquisitions.

KEY PLANS / PROGRAMS (cont'd)

Job Readiness Training Program for Immigrant / Refugee Youth and Families (Seattle) - This program funds partner community organizations working with immigrants and refugees as they strive to overcome multiple barriers to school success. The intended outcome is to help ELL (English Language Learner) youth & adults obtain livable wage jobs and become self-sufficient.

Youth and Family Job Readiness Program (El Centro de la Raza) - This ongoing program provides job readiness and retention assistance for ELL youth.

Core Plus (MIC) - A partnership between business, industry, and education to train and prepare secondary school students for skilled jobs in the industrial sector.

KEY CHALLENGES & OPPORTUNITIES

Challenges:

- Industrial and manufacturing sectors located in the Nearshore, Duwamish Valley, and Lower Green face redevelopment pressures as the local economy and human populations grow
- Agriculture and farming enterprises face similar land conversion pressures in the Lower and Middle Green as urbanization spreads
- Business owners near the Green and Duwamish Rivers find it difficult to navigate onsite stormwater regulations, which can seem sometimes arbitrary and costly to businesses
- Unpredictable changes in climate and development patterns pose an uncertain future for some business sectors within the watershed

Opportunities:

- Coordinate stormwater compliance actions to maximize positive user experiences
- Advance efforts to incorporate climate resilience (mitigation & adaptation) within the built environment
- Prioritize community development programs in the watershed, such as job training for ecological stewardship, that will support economic, social, and environmental sustainability