

Corrections & Climate: Evolving Solutions & Implications

Chandrika M. Kelso, J.D., M.F.S., Ph.D.

College of Law and Public Service
National University; Ckelso@nu.edu

Abstract—Climate change continues to be an ongoing discussion topic locally, or globally, whether it is methane from cattle or green-house emissions from various activities that help humankind on a daily basis. The paper explores the impact of prisons, density, architecture and design on the environment and inmate mental wellness. It unpacks the changes that have been incorporated in California, and the future benefits of these implementations in reducing the carbon footprint of prisons thereby improving resident mental health outcomes.

Keywords— *Environmental justice; ethics; prisons; restorative; green-house gasses; carbon emissions; prison architecture.*

I. INTRODUCTION

June 5th is designated and celebrated as World Environment Day, “to highlight that the protection and health of the environment is a major issue, which affects the well-being of peoples and economic development throughout the world. The celebration of this day provides us with an opportunity to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprise and communities in preserving and enhancing the environment. The energy-intensive building sector alone accounts for 39 per cent of global carbon emissions. 28% of which are associated with the energy required for the so-called “building operations” alone – such as heating, cooling, ventilation and lighting. The carbon emissions associated with construction account for the remaining 11 per cent. Thus, a fundamental transformation is the only option for the sector to become eco-responsible. Innovative technologies, the role of recycling in the built environment, the use of natural materials, and construction techniques adapted to local conditions are some of the paths to be explored in the quest for more sustainable architecture” [1]

A. Carbon footprint of Corrections

The long arm of climate and carbon impacts reaches, touches, caresses and perhaps in some instances, mangles many facets of life. Something that might appear to be innocuous might lead to something inconceivable. For example, a study published in Yale's Journal of Industrial Ecology attempts to “quantify the “carbon footprint” of crime, calculating

that crime committed in England and Wales during 2011 was responsible for more than 4 million metric tons of carbon dioxide. or the equivalent of the carbon footprint about 900,000 UK homes. The researchers broke down the carbon impacts by crime type, the subsequent costs associated with criminal justice system services, including police investigations and the impacts of operating prisons and court buildings. Among criminal offenses, burglary produced the largest proportion of the total footprint (about 30 percent), largely due to the emissions associated with replacing stolen or damaged goods” [2].

The American Correctional Association's (ACA) Commission on Accreditation for Corrections establishes the building criteria for prison construction ranging from safety features, accessibility, health services, and general living conditions for prisoners to cell size, advanced networks of cameras, motion sensors, X-ray machines, metal detectors, communication lines, electronic locking systems, and more. In general, it costs an average of 200-300,00 per cell, with double occupancy; costs vary by the security levels and also the number of inmates the prison plans to house, construction costs for a maximum security facility that houses 2.000 inmates could be over \$400 million [3] [4].

Colocation of prisons and preexisting pollution include landfills and waste sites. The concept of LULU- Locally Undesirable Land Uses, was the brain child of Professor Frank Popper, and is applicable to some but not all prisons. Decline in quality of life, land values, community image, creating stress on services, drop in property values are some of the impacts of LULUs becoming Prison fields. One study found that Oklahoma zip codes encompassing prisons have statistically higher levels of TRI emissions than zip codes without prisons [5] [6] [7]. However, research by Eason (2012) indicates marginalized communities often desire prisons, and Not In My Backyard' (NIMBY) has potential to become 'Please In My Backyard' therefore, community's LULU can be another's wish fulfillment [8] [9].

“For a long time, prisons were marginalized even within environmental justice research” (Cartier, 2023). The American Institute of Architects (AIA), professional codes of conduct due to their lack of engagement in ensuring prison architecture is ethically and morally sound [11]. In the year 2017,

prisons were officially included in the Environmental Justice Screening and Mapping Tool (EJScreen), to identify areas and groups of people that may have a greater need for environmental conservation efforts or have been exposed to undue environmental burdens. Ulrich's Supportive Design Theory (1991) focuses on how we can design buildings and environment that creates positive distractions in physical surroundings, social support and sense of control to help reduce stress and promote the healing process (Ulrich, 1991). While it addresses the needs of healthcare industry as a whole, the rationale of this theory can be applicable to prison designs as well because of similarities, both entities serve and house large groups of diverse people, and both have to have a certain amount of self sufficiency as part of the daily operations [12].

B. Prisoner Mental health and well-being

There is ample research that has delved into the mental health of the incarcerated population from impacts of environmental designs, and location of the prison, to contamination dangers of communal living in close quarters. We now know that the well-being of the incarcerated population is positively influenced when prison designs incorporated color and material textures [11]. There is a constant din of noise in any prison, regardless of the location or design. The day to day activities of the inmates, the usage of toilets and showers, the varying sleep and activity cycles, the radio, tv and other tools of entertainment, day room phones, tablet usages, books and magazines, footsteps reverberating on the waxed floors, doors clanking, the jingling keys as officers walk by, all contribute to an endless steady background noise that is inescapable.

Research in the field of environmental psychology has observed that "unpredictable, intermittent and uncontrollable noise. . . causes significant stress, with powerful and enduring negative impacts on wellbeing" [13]. This kind of repeated exposure to noise also negatively affects relationships between staff and incarcerated individuals, and exacerbates chronic stress, such as hypertension, vascular disorders, and asthma [14] [8].

Positive mental health outcomes have also been demonstrated in prisons where resident boredom, fatigue, and irritability was reduced while perceived safety and comfort increased when they were exposed to long-distance window views including images that simulate great depths of field. Additionally, the thermal comfort in prisons is influenced by the heat that is absorbed and radiated due to construction materials of brick, stone, and concrete [15] [16].

C. Climate Registry

Kyoto Protocol might be regarded as the first real global attempt to deal with the problem of climate change. According to Harvard Law Review (2023), environmental issues of climate change and pollution

that cause changes in weather patterns and/or temperatures have impacts on prisons. In 2007, the US and Canadian provinces established the Climate Registry which is responsible for the design and operation of voluntary and compliance greenhouse gas (GHG) reporting programs globally, and assists organizations in measuring, reporting, and verifying (MRV) the carbon in their operations in order to manage and reduce it. Green House Gasses regulated under the Kyoto protocol include Direct Emissions that "generally result from the use of fossil fuels or other manmade chemicals from boilers, furnaces, burners, turbines, heaters, incinerators, engines, flares, fuels in transportation sources, emissions from non-road equipment such as those in construction, agriculture and forestry, gases from the Physical and chemical processes (from manufacturing of cement, aluminum, adipic acid, ammonia, etc. Fugitive sources from intentional or unintentional releases such as SF6 from electrical equipment; HFC releases during the use of refrigeration and air conditioning equipment; and CH4 leakage from natural gas transport or landfills. We have to take into account the GHG emissions that occur at a natural gas power plant as a result of providing electricity to a local manufacturing company contribute to the manufacturer's indirect emissions and broad category of indirect emissions that includes all anthropogenic indirect emissions, and Biogenic CO2 emissions are generated during the combustion or decomposition of biologically-based material. Mobile emissions come from sources capable of emitting GHGs while moving from one location to another. These include both on-road and nonroad vehicles such as automobiles, trucks, buses, trains, ships and other marine vessels, airplanes, tractors, construction equipment, forklifts, ride-on lawn mowers, snowmobiles, snow blowers, chainsaws, and lawn care equipment" [18].

Many prisons lack systematic monitoring of water, air, and soil quality. Columbia University in New York researchers gathered EPA data for about 37,000 community water systems serving the same population year-round. They compared arsenic concentrations of systems that supply only correctional facilities with those of systems that also supply residential communities. They concluded that "Water systems that exclusively serve correctional facilities in the southwestern U.S. had average 6-year arsenic concentrations that were twice as high as those reported for other community water systems" in the region. The groundwater that supplies most water systems in the region has naturally occurring elevated arsenic levels because of the geochemical conditions in the aquifers and is leading source of arsenic contamination in the region and it is relatively easy to filter out [5].

The National Institute of Corrections Green Corrections Initiative seeks to increase awareness among corrections professionals about environmental issues related to the practice of corrections and focus

attention on the need to make correctional facilities more energy and resource efficient [19].

D. Green empowerment-California Dept of Corrections and Rehab-CDCR

This concept of Comte's that adversity compels improvement is evident in the changes made by the California Dept. of Corrections & Rehab (CDCR), they undertook an ambitious effort in the year 2007 as the first California State agency to measure its carbon emissions and report on these emissions in partnership with The Climate Registry. For starters, efficient cooling technologies are incorporated into construction and renovation projects at CDCR facilities. CDCR's light-duty fleet has increased the number of fuel-efficient vehicles over the last several years. CDCR has 682 traditional hybrid vehicles, 47 plug-in hybrids vehicles and eight battery electric vehicles (BEV). CDCR utilizes 'California Green' cleaning products manufactured by the California Prison Industry Authority (CALPIA). CALPIA products meet the Green Seal™ standard. Per section 2807 of the California Penal Code, CDCR must order items provided by CALPIA unless an exemption has been approved [19] [20].

"Water usage is continuous given the fact that prison building infrastructure includes housing units for inmates and the staff necessary to maintain a 7 day, 24-hour operations, CDCR was a diligent conservator of water even before it was popular or mandated. Flushometers are devices that limit the number of times toilets may be flushed in a predefined time period. From 2006 through 2008, the Department installed over 45,800 flushometers, on inmate cell toilets across the State, and yielded total water consumption reductions averaging 40 percent at each institution where they were installed" [20].

"California is required to invest resources in Disadvantaged Communities (DACs) using CalEnviroScreen, a tool that ranks census tracts based on a combination of social, economic, and environmental factors. several CDCR facilities are located within a DAC as identified by the CalEnviroScreen. CDCR is often the largest employer within the region. To ensure local residents were afforded the opportunity to obtain employment with CDCR, its last three major construction projects included contract language that required the construction firm to prioritize local hiring to build the projects.

CDCR also has Mutual Aid agreements with local first responder organizations to assist as needed in public service emergencies. Additionally, the Department provides community work crews comprised of inmates that will assist local partners with needed cleanup and infrastructure repairs. In instances where CDCR projects are unable to fully avoid effects to natural

resources, off-site mitigation is typically implemented through purchase of conservation credits within various habitat preserves. For all third-party energy conservation/generation projects, such as new on-site photovoltaic installations, CDCR performs life cycle costing to account for all costs related to construction, operation, maintenance, and disposal at the end of the useful life of a structure [20].

CDCR will continue to utilize energy efficiency projects to reduce GHGe. From 2019 through 2022, CDCR has a total of 51 energy efficiency and savings by design projects that are either in development or included in future projections. These projects are expected to provide annual cost savings of \$884,368 and additional GHGe reductions of over 6,538 metric tons per year" [20].

E. Discussion & Conclusions

"Sustainable practice also implicates responsibility for the long-term stewardship of buildings and their materials, encompassing the creation, operation, maintenance and renewal over generations. This also relates to the retention and adaptive re-use of existing buildings, highlighting the intersection between sustainable development and architectural conservation" [1].

Therefore, political decisions must involve the difficult conversations about our role in preserving and respecting the nature around us, whether it is for our immediate use and needs or for future generations. It must remain on our radar. Being eco-centric might be our most successful path forward in achieving this goal.

We can continue to institute successful preventive and curative measures from utilizing ethical, environmentally sound designs and architecture for prisons, reducing GHEs, solar panels to create enough energy for prisons to be self-sustaining, composting food waste in prison, recycling plastic and paper products in all prisons, to encouraging and empowering inmates to grow fruits and vegetables on the prison yards or in raised beds and more. There are so many opportunities and tools at our disposal which initially might cause minor stress on the facility's budget but will yield long term restorative gains not only for inmate physical and mental health but most importantly will maintain the integrity of the land and nature around us for many generations by simply adopting and deploying climate conscious prison practices. This has to include all correctional facilities regardless of the location, rather than our current piece-meal approach to protecting our world and nature. I close with this beautiful quote "*Nature never did betray the heart that loved her*" Wordsworth, Tintern Abbey.

REFERENCES

- [1] UNESCO Courier (2024, January 30). Architects and urban planners at the forefront, Retrieved from <https://www.unesco.org/en/days/environment>
- [2] Skudder, H. (2016, June 21). Addressing the carbon-crime blind spot: A carbon footprint approach. *Journal of Industrial Ecology*, Yale University. Retrieved from <https://environment.yale.edu/news/article/the-carbon-footprint-of-crime>. 2016, June 21.
- [3] Prison Inside-Prison Guide (2023, September 14). How much does it cost to build a prison: A comprehensive guide. Retrieved from <https://prisoninside.com/how-much-does-it-cost-to-build-a-prison/>.
- [4] Rosenberg, L. (2021, December 01). Yet another reason to abolish prison systems: Their environmental impact. *Green Matters*. Retrieved from <https://www.greenmatters.com/p/environmental-impact-prisons>.
- [5] Cartier, K. M. S. (2020, November 10). An unfought geoscience battle in U.S. prisons, *Eos*, 101, <https://doi.org/10.1029/2020EO150533>. Published on 10 November 2020.
- [6] Leon-Corwin, L., et al. (2020), Polluting our prisons? An examination of Oklahoma prison locations and toxic releases, 2011–2017, *Punishment Soc.*,22(4),413-438, <https://doi.org/10.1177/1462474519899949>.
- [7] Opsal, T., & Malin, S,A, (2019, May 07). Prisons as LULUs: Understanding the parallels between prison proliferation and environmental injustices. *Sociological Inquiry*. Retrieved from <https://doi.org/10.1111/soin.12290>
- [8] Eason JM (2012) Extending the hyperghetto: Toward a theory of punishment, race, and rural disadvantage. *Journal of Poverty* 16: 274–295.
- [9] Perdue, R. T. (2023). Trashing Appalachia: Coal, prisons and whiteness in a region of refuse. *Punishment & Society*, 25(1), 21-41. <https://doi.org/10.1177/14624745211011526>
- [10] Cartier, K.M. (2023, December 11). Satellites map environmental vulnerabilities in U.S. prisons. Retrieved from <https://eos.org/articles/satellites-map-environmental-vulnerabilities-in-u-s-prisons>
- [11] Engstrom, K.V., Van Ginneken, E.F. (2022, June 22) Ethical prison architecture: A systematic literature review of prison design features related to wellbeing. *Space and Culture (SAC)* Volume 25 (3). Retrieved from <https://doi.org/10.1177/120633122211042>
- [12] Ulrich R. S. (1991). Effects of interior design on wellness: Theory and recent scientific research. *Journal of Health Care Interior Design*, 3, 97–109.
- [13] Karthaus R., Bernheimer L., O'Brien R., Barnes R. (2017). *Wellbeing in prison design: A design guide*. <http://www.matterarchitecture.uk/research/>
- [14] Beijersbergen, K.A., Dirkzwager, A.J., Van der laan, P., and Nieuwbeert, P. A. (2014). Social Building? Prison Architecture and Staff–Prisoner Relationships. *Crime and Delinquency*, vol.62, no.7. 2014. <https://doi.org/10.1177/0011128714530>
- [15] Clear, T.R. & Cole, G.F. & Reisig, M.D. (2021). *American Corrections*. 13th Ed. 978-1-305-09330-0. 2021. Available at <https://nu.vitalsource.com/reader/books/9798214337265/epubcfi/6/2%5B%3Bvnd.vst.idref%3Dcover-page%5D!4/2%5Bcover-page%5D/6%5BJCREHXR596UQ4WV3Y699%5D/2%4051:98>
- [16]. Moran D., Turner J.(2019). Turning over a new leaf: The health-enabling capacities of nature contact in prison. *Social Science & Medicine*, 231, 62–69.
- [17] Harvard Law Review. Climate carceralism: The future of climate-linked prison labor. Vol. 137 (2). Retrieved from <https://harvardlawreview.org/print/vol-137/climate-carceralism-the-future-of-climate-linked-prison-labor/>. 2023, December 11.
- [18] The Climate Registry. General reporting protocol 2019. Version 3.0. Retrieved from <https://theclimateregistry.org/wp-content/uploads/2022/11/General-Reporting-ProtocolV3.pdf>. 2019.
- [19]. National Institute of Corrections (NIC, n.d.). <https://nicic.gov/green-corrections-challenge>
- [20] Beland, D., Ahmed, T., & Fong, D. (2018). Department of Corrections and Rehabilitation sustainability roadmap 2018-2019. Progress report and plan for meeting the Governor's sustainability goals for California state agencies. Retrieved from <https://www.cdcr.ca.gov/green/wp-content/uploads/sites/176/2020/05/2020-21-1->