**The effects of flood buyouts and green infrastructure on nearby property values**

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Property buyouts have been widely implemented as a hazard mitigation strategy to relocate residents to a safer location and reduce potential flood damages. Green infrastructure (GI) is an established stormwater management tool that can help to detain and filter stormwater runoff and lower any heat island effects through rich vegetation and permeable land surface. Amenity effects from increased tree canopy, open green space, and vegetation coverage are not only site-specific but can increase values at the neighborhood level and in adjacent areas. Both amenity and risk reduction aspects might, at least, minimize negative effects from proximity to flood-prone areas; more optimistically, they might increase property values. While these benefits of buyout programs and GI are well-known, how buyout activities impact the community and the municipality and how existing GI interacts with flood buyout activities have not been studied. Through examining the dynamics of climate adaptation policies - buyout programs and GI - and their effects on nearby property values, this study enhances the understanding of how land-based approaches such as residential relocation and ecological restoration policies can interact with property values and municipal finance.

We use Harris County, Texas, as a case study to examine flood buyout activities in and around the City of Houston mainly focusing on assessed property value change in relation to buyout activities. Our goal is to improve the understanding of the indirect effects of land-based hazard mitigation (or climate adaptation) strategies on nearby properties and neighborhoods. Specifically, we question what are the effects of floodplain buyout activity on nearby tax-assessed property values. To answer the question, we will measure and disentangle the effects of buyout activity with respect to the potential: (1) negative effects of buyouts on nearby single-family property values due to the signaling of future hazard risks and neighborhood depopulation and disinvestment; and (2) increased resiliency of property values to nearby flood damages facilitated through green infrastructure. Assessor property data downloaded from the Harris County Appraisal District (HCAD) was used to identify single-family parcels from 2008 to 2020. Flood buyout properties were received from the Harris County Flood Control (HCFCD) where the buyout process is managed and executed. We then measured the number of buyouts in four different ring sizes around each property using 500, 1,000, 1,500, and 2,000 feet as the ring thresholds. For GI, we used the 2016 EarthDefine tree canopy data. To identify the effect of flood buyouts on nearby property values, we estimated a series of panel regression models.

Our findings suggest that nearby buyout activities, particularly those that are seen in close proximity to the property, tend to have a negative influence on nearby property values and may result in a loss of the municipal tax base. This study also suggests that a buyout within the past year actually has a short-term positive effect on the property value. Though, this positive effect does not last long as it changes to a negative effect after one year has passed. It is possible that this pattern is related to the condition of post-buyout properties, that is, how these properties have been managed after move-out and demolition. We also measured the level of tree canopy coverage around each single-family property to see how influential it is to have tree canopy coverage not only as a climate adaptation tool but also as a way to reduce the loss of tax base caused by property buyouts. We find that properties with higher tree canopy levels tend to have

higher property values, which is in line with the existing literature. Additionally, a mitigating effect of tree canopy coverage on the relationship between buyout activities and property values is observed, though the effect is not linear.

This study points to the possibility of a reduction in the local tax base as a result of the increased flood buyout properties in Harris County, Texas. While the loss of property taxes due to buyout and relocation may be expected, additional losses from spillover effects onto nearby properties can be concerning. This raises further questions about equity for remaining residents who may be already dealing with disinvestment and population loss in the area. Further considerations should be asked: should a relocation within the same municipality be prioritized so the amount of tax base collected through property taxes can be sustainable? To sustain the tax base in the face of tax revenue loss from buyout activity, is it inevitable to collect a higher rate of property taxes or find other revenue sources? More importantly, what do municipalities envision for communities experiencing consistent buyout activities in the past decades? How buyout properties are managed after closing and demolition could potentially determine whether the buyout properties are considered as green infrastructure or as vacant/abandoned properties, or more abstractly, as an amenity or a disamenity. As our study suggests that existing tree canopy coverage can increase property values and diminish the negative effects of buyout activities, potential tax loss from buyout activities could be minimized by enhanced greenery and the natural environment. While it may be inevitable to move forward with a buyout program, this study stresses the importance of post-buyout maintenance and the conversion into green infrastructure.