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# **FEMA-Funded Property Buyouts: The Impacts on Land and People**

Literature Review

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# 1. Executive Summary

The Federal Emergency Management Agency (FEMA) spent over \$2 billion in land acquisitions (buyouts) from 1993-2011 (Polefka, 2013; Maly & Ishikawa, 2013). Through the Hazard Mitigation Grant Program (HMGP), FEMA helps communities implement hazard mitigation measures and support cost-effective post-disaster initiatives that eliminate or reduce long-term risks to people and property (FEMA, 2016). Despite the continued use of buyouts, not enough research exists on how buyouts affect land uses or the people who have participated in buyout programs. The goal of this literature review is to help establish best practices for local governments to use to (1) decide whether implementing a FEMA-funded buyout program is the best choice, (2) administer FEMA-funded buyouts if they choose to implement a program, (3) properly assist their constituents in the process of relocating, and (4) improve how acquired land is managed. To do so, this literature review attempts to answer the following research questions:

1. How do FEMA buyouts impact the **land** bought by the local government? Specifically, how have properties been converted? What are the challenges to conversion? How are communities involved in the process?
2. How do FEMA buyouts impact the **people** who participate in the program? Specifically, where do people relocate? What were their experiences with the process? What convinced them to relocate rather than rebuild?

This report reviews 14 articles. The results generally indicate that there are wide varieties of outcomes for land uses and people's experiences given how dependent each buyout program is on the municipality. In terms of **land**, the literature informed us of the following:

- There is a lack of evidence that buyout programs have evolved over time or exhibited signs of policy learning despite past failures (Greer & Binder, 2016).
- The majority of FEMA-funded buyouts remained as vacant lots from 1993-2000 (Zavar, 2015; Zavar & Hagelman, 2016). The same seems to be true after more recent natural disasters.
- Two of the biggest challenges to managing bought-out open space are (1) maintenance of the land, and (2) costs associated with the management (Zavar & Hagelman, 2016).
- Efforts to engage the community in land conversion decisions are inconsistent (Zavar & Hagelman, 2016).
- Fiscal impact analyses indicate that buyouts can create value (rather than loss) for governments if appropriately managed, such as relocating people within municipal boundaries but outside of floodplains (Freudenberg, Calvin, Tolkoﬀ, & Brawley, 2016).

In terms of the **people**, the literature informed us of the following:

- Buyouts negatively impact a community's social and psychological health, and these effects are mediated by certain sociodemographic factors (i.e., race and income). Transparent communications, inclusive engagements with the community, and integrating help at multiple governmental/organizational levels can offset the negative impacts. (Freudenberg et al., 2016; Muñoz & Tate, 2016)
- Buyouts are more successful for the community when municipalities provide housing counseling and upfront relocation costs, and "when pre-storm value is more competitive." (Freudenberg et al., 2016)
- Trust plays a key role in who chooses to participate in a buyout. Counterintuitively, those who choose to participate in a buyout are less likely to trust buyout managers than those who decide to rebuild (De Vries & Fraser, 2012).
- A primary reason people would consider relocating is for the safety of their family (Bukvic & Owen, 2017; Henry, 2013).
- Active participation in buyout programs occur when local officials engage or partner with community based organizations to make shared decisions (Binder, 2014).
- Little research exists as to where people relocate. However, Mcghee, Albright, and Binder (2017) identified trends in relocation with people who participated in New York City's buyout programs. Three-fourths relocated within the same county, with almost a quarter relocating within the same zip code in Staten Island. "None of the case studies consider the relocation of buyout participants or confirm that they have moved outside of the area vulnerable to flooding" (Mcghee et al., 2017, p. 40).

The results of this literature review mark a need to conduct empirical analyses on land and socioeconomic outcomes post-buyouts, and using such evidence to develop a best practices guide for local governments.

## 2. Introduction

In 2016, fifteen natural disasters led to \$46 billion in direct costs and 138 fatalities in the United States ([Smith, 2017](#)). Numerous federal, state, local, and private efforts exist to minimize the damages caused by these natural disasters. One of the main hazard mitigation initiatives is done through Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP). The program aims to help communities implement mitigation measures, and support cost-effective post-disaster initiatives that eliminate or reduce long-term risks to people and property ([FEMA, 2016](#)). The HMGP allows governments to help complete property acquisitions (or buyouts) as a hazard mitigation measure after a major disaster declaration. Buyout programs are voluntary, meaning that if a government obtains funding, property owners are under no obligation to sell their home. FEMA describes the intention of buyout programs as such:

*"Acquisition projects are based on the principle of fair compensation for property. Property acquisitions present owners with an opportunity to recoup a large part of their investment in property that probably has lost some, if not most of its value due to damage after a disaster. Under the Stafford Act, any land purchased with Hazard Mitigation Grant Program funds must be restricted to open space, recreational, and wetlands management uses in perpetuity" - FEMA, 2016*

To obtain HMGP funding for buyouts, a state emergency management office must apply with an approved hazard mitigation plan and potential projects the grant will fund within the state ([FEMA, 2016](#)). A government or tribal organization must also meet a 25% cost-sharing requirement from a variety of sources as HMGP only covers 75% of the cost. HMGP-funded buyouts do not cover any real estate transaction costs or relocation expenses for individuals.

It is estimated that FEMA spent over \$2 billion on land acquisitions between 1993 and 2011, resulting in about 20,000 acquired households ([Polefka, 2013](#); Maly & Ishikawa, 2013). Despite the popularity of buyouts with natural hazard mitigation, little research has been conducted on what happens to the land and the people after the buyout process ends. This literature review will explore how buyouts affect a community's land uses and the long-term effects of buyouts on people who participated in the program. The goal of this literature review is to help create a best practices document that local governments can use to (1) administer FEMA-funded buyouts, (2) properly assist their constituents in the process of relocating, and (3) improve how newly acquired land is managed.

### *Research Questions*

As a way to understand what happens to the land and people post-buyouts, we tried to answer the following two questions:

1. How do FEMA buyouts impact the **land** bought by the local government? Specifically, how have properties been converted? What are the challenges to conversion? How are communities involved in the process?

2. How do FEMA buyouts impact the **people** who participate in the program? Specifically, where do people relocate? What were their experiences with the process? What convinced them to relocate rather than rebuild?

### 3. Approach and Methods

To identify research articles to inform best practices, we followed a seven-step process:

1) identify research questions of interest, 2) specify inclusion/exclusion criteria and search terms, 3) search the literature (grey and published), 4) review titles and abstracts, 5) retrieve and review full articles, 6) review the data, and 7) prepare this summary report.

The eligibility criteria for this literature review covered the parameters shown in **Table 1**. We excluded studies not published in English and those that did not address our key research questions. In addition, we excluded articles that do not study buyouts funded by FEMA (i.e., buyouts funded by state governments and other funding sources were excluded).

**Table 1. Parameters for the Literature Search**

<b>Study Populations</b>	Local governments using HMGP funds for buyouts
<b>Study Topics</b>	<ul style="list-style-type: none"> <li>• What occurs to land that has been acquired through HMGP funds?</li> <li>• How is the community involved in the buyouts?</li> <li>• What are the community’s experience with participating in the program?</li> <li>• What are the challenges of land conversion post-buyout?</li> </ul>
<b>Disaster Types</b>	Floods, Fires, Hurricanes
<b>Dates</b>	2012–present (to understand recent trends in management of buyouts)
<b>Publication Languages</b>	English only
<b>Study Location</b>	United States only
<b>Article Types</b>	Published and unpublished; journal articles, books, government reports, etc.

In conducting the search, we started with the search terms shown in **Table 2**.

**Table 2. Selected Search Terms**

Search Terms			
Program Terms	Natural Hazard Terms	Effect Terms	Actor Terms
FEMA buyouts~	Flood	Impact	Decision-making
Government buyout and FEMA	Fire	Aftermath	Volunteer
Buyout program and FEMA	Hurricane	Post-disaster relief	Participate
FEMA acquisition		Land value	Participants
		Land use	Disaster mitigation
		Consequences	
		Vulnerability	

Using the identified set of search terms, we conducted an electronic literature search in the following databases:

- UNC Articles+
- Google Scholar
- PAIS Index

In addition, we searched gray literature to locate empirical, non-research publications that might not be found in the academic literature. Techniques for searching gray literature included using Google Scholar through snowballing methods by identifying relevant articles and searching for similar results.

### *Search Results*

Using the approach and methods outlined, the targeted search yielded 219 articles. Abstracts and titles were reviewed and determined eligible for further review according to the following criteria:

- Articles addressed FEMA-funded buyouts.
- Articles addressed local governments' decisions with land conversions and challenges.
- Articles included the community's experience with the buyout process.
- Articles were based in the United States.
- Articles were available in English.
- Articles were published on or after January 2012.

After reviewing the titles and abstracts, we reduced the list to eighteen articles that might help us answer the research questions. And after a full article review, fourteen articles were relevant.

## 4. Findings

This section summarizes the findings from the literature search and abstraction process conducted. The findings are organized into two domains: 1) impact on the land and municipalities; and 2) impact on the people and community.

### ***Impact on the Land and Municipalities***

#### **Summary of Key Findings**

- There is a lack of evidence that buyout programs have evolved over time or exhibited signs of policy learning despite past failures (Greer & Binder, 2016).
- The majority of FEMA-funded buyouts remained as vacant lots from 1993-2000 (Zavar, 2015; Zavar & Hagelman, 2016). The same seems to be true after more recent natural disasters.
- Two of the biggest challenges to managing bought-out open space are (1) maintenance of the land, and (2) costs associated with the management (Zavar & Hagelman, 2016).
- Buyout programs show inconsistent levels of engaging the community with land conversions (Zavar & Hagelman, 2016).
- Fiscal impact analyses indicate that buyouts can create value (rather than loss) for governments if appropriately managed, such as relocating people within municipal boundaries but outside of floodplains (Freudenberg, Calvin, Tolkoﬀ, & Brawley, 2016).

#### *Land Uses*

Communities established on floodplains—whether coastal or river floodplains—must weigh three options in their decision to participate in a buyout program: (1) Rebuild as usual; (2) Rebuild with modifications to reduce future damages; or (3) Relocate to avoid future damages (Bukvic & Owen, 2017; Freudenberg et al., 2016). If a community chooses the third option, however, there is no set standard on future land uses of acquired properties.

Zavar (2015) noted that post-buyout, “land uses range from well-managed public spaces offering residents amenities such as playgrounds and walking trails, to minimally maintained vacant lots within the residential landscape” (p. 79). Of 333 HMGP-funded buyouts from 1993-2000, 34.2% of the sites were vacant lots (mowed grass or bare soil) and many were found scattered in between private properties (Zavar & Hagelman, 2016). A large portion of post-buyout land uses were for recreational

purposes, such as parks (14.4%), athletic facilities (9%), hike/bike trails (7.5%), and playgrounds (7.5%). Other uses ranged from parking lots (5.7%) to memorials (0.9%) to other purposes.

The land use patterns described by Zavar and Hagelman (2016) match more recent examples illustrated by Freudenberg et al. (2016). They featured three case studies funded by the FEMA HMGP, though only two of the studies discussed what occurred to the land after acquisitions. In Milford, Connecticut, only seven homeowners opted to participate in the buyout despite about 2,000 homes being damaged and not meeting building code requirements in the floodplain. The town anticipated a greater participation rate and hoped to incorporate the acquired parcels into the adjacent state park. Yet, the land remains vacant and separate from the state park. In Sayreville, New Jersey, the borough acquired 199 homes; the town chose to let those properties “return to nature” (Freudenberg et al., 2016, p. 54).

The studies and examples illustrate the lack of evolution in how acquired land is administered, a concept Greer and Binder (2017) explored through a policy learning framework. According to the study, buyout programs have little standards of transparency. Buyout programs throughout the years lacked clear information on how buyouts will be administered, timelines of the process, or requirements needed by the homeowners participating. In the case of Hurricane Floyd buyouts in North Carolina, opaque policies were used to make buyout programs less voluntary than is required. The lack of best practices for buyout and post-buyout administration—or systematic studies of buyout programs—make it difficult for governments to make informed decisions that build upon past experiences, and thereby repeat many of the same mistakes (Greer & Binder, 2017).

### *Conversion Challenges and Successes*

After the release of FEMA's *Community Handbook on Open Space Management* (1998), the percentage of vacant land remained comparable to land uses before the handbook was released. Zavar and Hagelman (2016) surveyed 142 municipal floodplain managers about their challenges and successes converting buyout land to open space and managing the open space. Twelve percent of respondents shared that the community did have an open space management plan while the remaining 88% stated they did not have one, did not know, or had no response. Zavar and Hagelman speculate that occurrence of vacant lots likely occurs because of a community's lack of planning. Another major challenge with conversion is the maintenance and costs associated with open space management, with a bulk of the funding coming from the general budget (60%) (Zavar & Hagelman, 2016).

Despite these challenges, Zavar and Hagelman's (2016) survey indicate that communities do believe the open space buyouts reduce property losses from future disasters in the community. The perception of loss reduction is important to obtain the support for different land uses post-buyouts.

### *Community Perceptions of Converted Spaces*

In 2015, Zavar analyzed how residents within five neighborhoods of Lexington, Kentucky, perceived the utility of the FEMA-funded acquired land. In those communities, only one neighborhood converted the acquired land into something other than vacant lot: a labyrinth (Zavar, 2015). Two hundred and fifty residents were surveyed and 65.2% of participants believed the open space had no impact on property value—interestingly, this belief was more consistent among respondents who resided in the neighborhood prior to the acquisitions. Eighteen percent reported higher impact on their property value, while 7.7% reported that it decreased their property value. The majority of those who believed their values decreased were from the one neighborhood with the formal conversion (labyrinth).

It was not clear from the study whether the community was involved in the conversion process. However, it did note that some residents were active in obtaining grants for the beautification of the vacant lots (Zavar, 2015).

### *Fiscal Impact*

Freudenberg et al. (2016) created a report summarizing and analyzing buyout programs with a focus on Hurricane Sandy recovery efforts. The team suggests local governments can make a fiscally-driven decision based on the following two questions:

1. Which types of land use generate the highest revenue and the lowest costs?
2. What are the costs and benefits of removing a development from the city budget?

Freudenberg et al. (2016) noted that not all governments who decided to take on buyouts went through a fiscal impact analysis, and often the financial impact of a buyout is less significant than governments anticipate especially when buyout funding is matched with local, state, and federal funds. "Buyouts can create value if the local government takes appropriate steps to turn purchased parcels into local amenities, such as restoration areas or parkland, while embracing more intense residential development in areas without flood risk" (Freudenberg et al., 2016, p. 38). In some cases, a government's tax roll can increase if the land is converted as suggested and if residents are relocated within the municipality. However, the researchers understand that such scenarios are

difficult to replicate given the lower property values of homes located in floodplains, and continual disaster relief after multiple disasters can create divestment and reduce the community's economic health.

## ***Impact on the People***

### **Summary of Key Findings**

- Buyouts negatively impact a community's social and psychological health, and these effects are mediated by certain sociodemographic factors (i.e., race and income). Transparent communications, inclusive engagements with the community, and integrating help at multiple governmental/organizational levels can offset the negative impacts. (Freudenberg et al., 2016; Muñoz & Tate, 2016)
- Buyouts are more successful for the community when municipalities provide housing counseling and upfront relocation costs, and “when pre-storm value is more competitive.” (Freudenberg et al., 2016)
- Counterintuitively, those who choose to participate in a buyout are less likely to trust buyout managers than those who decide to rebuild (De Vries & Fraser, 2012).
- A primary reason people would consider relocating is for the safety of their family (Bukvic & Owen, 2017; Henry, 2013).
- Active participation in buyout programs occur when local officials engage or partner with community based organizations to make shared decisions (Binder, 2014).
- Little research exists as to where people relocate. However, McGhee (2017) identified trends in relocation with people who participated in New York City's buyout programs. Three-fourths relocated within the same county, with almost a quarter relocating within the same zip code in Staten Island. “None of the case studies consider the relocation of buyout participants or confirm that they have moved outside of the area vulnerable to flooding” (McGhee, 2017, p. 40).

### *The Buyout Experience*

In the United States, governments are not required to consider “where the resident will relocate to” during the buyout process; it is essentially “a property sale and ends with payment” (Maly & Ishikawa, 2013, p. 1).

A buyout process can take months to years to complete (Muñoz & Tate, 2016). Muñoz and Tate (2016) compared the recovery differences between buyouts funded by HMGP and by Community Development Block Grants (CDBG) following the June 2008 flooding in Iowa. Even though HMGP-funded buyouts were completed faster than CDBG buyouts, the HMGP buyouts still took more than a year to complete. In Cedar Rapids, the government obtained the HMGP funding in September 2009 and completed the acquisitions by April 2011 (Muñoz & Tate, 2016). In Iowa City, the program was completed by July 2011. Binder and Geer (2016) described the experiences of those who participated in buyouts after Hurricane Sandy. As the researchers illustrated:

*“Homeowners described the year between Sandy and the first home purchase as a constant state of waiting: waiting to learn what the state’s offer on their house would be, waiting for the results of inspections, waiting for help from FEMA and insurance companies, waiting to see how high the new flood insurance rates would be, and waiting to see whether the sale of their homes would actually go through.” - (Binder & Geer, 2016, p. 102)*

The timing of buyouts matter because of the social and psychological stressors associated with losing a home and relocating. Freudenberg et al. (2016) reviewed the health impacts of buyouts and found that buyouts “can provide relief from stressful situations by relocating residents to areas that provide new opportunities,” but people experience “stress during the recovery period by creating housing insecurity or disrupting place-based social support networks” (p. 42). In their study of recovery rates in Iowa, Muñoz and Tate (2016) found Hispanics and the elderly to have significantly lower than average recovery rates based on the appraisal value of their homes, making it more difficult to find affordable housing in places outside the floodplain.

### *Relocating*

A few key articles explored people’s motivations to participate in a buyout and relocate. De Vries and Fraser (2012) interviewed 60 key informants and surveyed 316 homeowners who were offered buyouts in Greenville, NC; Kinston, NC; San Antonio, TX; and Grand Forks, TX. Despite all four programs having nearly 90% participation rates, nearly 35% (n=108) of surveyed participants believed their participation was not voluntary due to socio-political pressure (De Vries & Fraser, 2012). Half of those 108 participants also noted they would have preferred to rebuild if the city gave them the chance. The 10% of respondents who declined the buyout multiple times credited their rejection to mistrust of those managing the buyouts. A quote from an interview with a buyout manager illustrates the role trust played during the buyout process:

*“I don’t know if mistrust is the word ... I think many of the people were so confused, dazed, and uncertain that they didn’t know who to trust. And so weren’t making a judgment as to... they did or didn’t trust anyone. They were really looking for help. I mean it was kind of like the wondering. Particularly, those whose homes were destroyed.” (Buyout Manager, Greenville, NC, p. 20)*

De Vries and Fraser (2012) also suggested that “buyout managers’ activities were guided by the belief that the more ‘voluntary’ floodplain mitigation programs are made, the higher the odds are that homeowners will not participate in buyouts” (p. 28). For example, one of the interviewers shared they emphasized “the potential risk participants faced when they chose ‘to stay behind alone’” (p.19). This point was supported in other literature describing how governments use policy tools (e.g., moratoria on construction) to increase the rate of participation in buyouts, thereby reducing the trust in the program’s intentions (Binder & Greer, 2016).

There is additional evidence of attitudes around the choice to relocate or rebuild after Hurricane Sandy’s destruction in New York—which used state-based and CDBG funding for its buyout program—and parts of New Jersey (Bukvic & Owen, 2017). The researchers found statistically

significant results for one particular reason to relocate: “the health and safety of myself and/or family.” The survey indicated that most people understood the risks of future flooding, though 73% of respondents thought the best way to prevent future impacts was through levees and seawalls. Only 10% believed “relocating to a safer area” would be a preferable option (Bukvic & Owen, 2017).

Bukvic and Owen (2017) also found that a majority of participants would choose to relocate independent of their neighbors, friends, and family’s decisions. This latter result partially opposes literature about motivations to relocate after disaster. For example, Henry (2013) interviewed 108 people who immediately evacuated Louisiana after Hurricanes Katrina and Rita—some chose to stay and some chose to relocate. In the analysis, interviewees who chose to rebuild noted their main reasons to be because of housing circumstances, with proximity to family and work playing a significant role. Those who chose to relocate did so for the safety of their family, to avoid future risk, or because of work opportunities (Henry, 2013). In many cases, researchers conclude the final decision to rebuild or relocate is marked by uncertainty and was the source of much stress (Binder, 2014).

#### *Quality of Life Post-Buyout*

There was little literature to inform the impact buyouts have on a participant’s quality of life post-disaster. There are speculations that participating in a buyout increases certain health and financial risks (Binder & Greer, 2016), but no evidence was found within this literature review. However, a few unintended consequences have been observed regarding the surroundings of the neighborhood. After Hurricane Floyd in eastern North Carolina, areas that participated in buyouts saw a further decrease in affordable housing (Smith, 2014), which adds to housing security stress for people seeking to relocate within the community. Often times, government officials coordinating the buyout process in one area continue to allow development in other flood-prone locations that put those future residents at risk (Smith, 2014).

In a vulnerability and relocation analysis of Staten Island buyout participants post-Hurricane Sandy, McGhee (2017) found that 75% of participants relocated within the same county, with almost a quarter relocating within the same zip code in Staten Island. “None of the case studies consider the relocation of buyout participants or confirm that they have moved outside of the area vulnerable to flooding” (McGhee, 2017, p. 40). Yet, nearly all (99%) participants were estimated to have increased or sustained exposure to disaster risk and social vulnerability.

## **5. Recommendations**

The literature suggests a gap in standards for managing FEMA-funded buyout programs, and a gap in evidence on the effectiveness of buyouts. Local governments varied widely in their management of buyouts and often did not adapt their responses based on results from previous events, likely due to a lack of guidance and an overly flexible program.

Much of the literature recommends local governments to clearly present information to communities potentially needing to relocate and engage them throughout the process as this results in a more satisfying outcome (Freudenberg et al., 2016). Given this information, it is essential to conduct empirical research that evaluates the outcomes of buyouts, tracks where people relocate and how successful they are at recovering, and assesses the suitability of buyouts for particular governments. Following such research, it is important to develop a guide for best practices tailored for local governments at risk for future natural disasters.

## 6. Literature Review Tables

**Table 3. Summary of Articles Related to Land Uses**

Article Information	Overview of Article	Key Findings	Implications for Best Practices
Collenteur, R. A., De Moel, H., Jongman, B., & Di Baldassarre, G. (2015). The failed-levee effect: Do societies learn from flood disasters?	Explores the impact of the 1993 Mississippi flood on the population dynamics spatial distribution in floodplains.	Compared to areas unaffected by the 1993 flood, population growth was 50% lower in floodplains from 1990-2000.  However, population boomed in floodplains from 2000-2010 likely because 9 levees were built in those areas.	Post-disaster development plans should consider long-term growth strategies within the floodplains.

(continued)

Article Information	Overview of Article	Key Findings	Implications for Best Practices
<p>Freudenberg, B. R., Calvin, E., Tolkoﬀ, L., &amp; Brawley, D. (2016). <i>Buy-In for Buyouts. The Policy Focus Report Series.</i></p>	<p>Comprehensively reviews how diﬀerent communities in the NYC metropolitan area managed buyouts following Hurricane Sandy. The report explores social, physical, and ﬁnancial impacts.</p>	<ul style="list-style-type: none"> <li>• Not all governments who create buyout programs go through a ﬁscal impact analysis.</li> <li>• Fiscal impact analyses indicate that buyouts can create value (rather than loss) for governments if appropriately managed, such as relocating people within municipal boundaries but outside of ﬂoodplains.</li> <li>• The most immediate ﬁnancial impacts of buyouts occur during the property acquisition: pre-acquisition costs, purchase price, property maintenance, and demolition.</li> <li>• Impact of removing a property from tax rolls are less signiﬁcant than public oﬃcials estimate.</li> <li>• “Buyout programs are most successful when relocation costs and housing counseling are provided and when pre-storm value is more competitive” (p. 31).</li> </ul>	<p>Local governments should conduct a ﬁscal impact analysis before choosing to implement a buyout program, especially if they are faced with community opposition to buyouts.</p>

(continued)

Article Information	Overview of Article	Key Findings	Implications for Best Practices
<p>Greer, A., &amp; Brokopp Binder, S. (2016). A Historical Assessment of Home Buyout Policy: Are We Learning or Just Failing?</p>	<p>Applies a policy learning framework to determine whether buyouts have shown evidence of learning, and recommends a new typology for practice.</p>	<ul style="list-style-type: none"> <li>• There is a lack of evidence that buyout programs have evolved over time or exhibited signs of policy learning despite past failures.</li> <li>• This might be due to a lack of buyout program evaluations or empirical examinations of buyouts.</li> <li>• Goals within buyout programs sometimes conflict and often don't apply best practices.</li> <li>• Policy learning was evident only in Kinston, NC, likely because two major floods occurred within a couple of years.</li> </ul>	<p>There is need for a best practices guide rooted in evidence and past experiences. The evidence can be gathered through meta-analyses, efficacy and desirability studies, and longitudinal cohort studies.</p>
<p>Maly, E., &amp; Ishikawa, E. (2013). Land acquisition and buyouts as disaster mitigation after Hurricane Sandy in the United States.</p>	<p>Studies how effective the mitigation strategies were in 3 buyout programs in the NYC metro area following Hurricane Sandy.</p>	<p>All 3 programs approached buyouts differently though their long-term aims are to create open space and buffer zones.</p> <p>The buyout programs still represent a minor portion of recovery efforts, making them less effective with land use planning given other zoning policies.</p>	<p>Decisions to implement a buyout program would improve with empirical studies evaluating their effectiveness.</p>

(continued)

Article Information	Overview of Article	Key Findings	Implications for Best Practices
Maly, E., Kondo, T., & Banba, M. (2017). Experience from the United States: Post-Katrina and Sandy.	Reviews how several buyout programs in NY and NJ avoided negative land use patterns that occurred after Hurricane Katrina buyouts.	<ul style="list-style-type: none"> <li>• Buyouts do not significantly improve the safety of a community, rather just the safety of the individual homeowner who chooses to relocate.</li> <li>• In Long Island, lots that were eligible for buyouts (but not taken) have newer, larger homes.</li> <li>• Many of the homes that were acquired in Long Island now stand as open lots with overgrown grass.</li> <li>• CDBG-DR funds are more flexible than HMGP funds.</li> </ul>	Governments might want to consider other alternatives to buyouts if they want to move entire communities from high-risk areas, and place restrictions on future development in previously-eligible buyout land.
Zavar, E. (2015). Residential Perspectives: The Value of Floodplain-Buyout Open Space	Analyzes how residents within five neighborhoods of Lexington, KY, perceived the utility of the FEMA-funded acquired land. The study surveyed 250 residents.	<ul style="list-style-type: none"> <li>• Majority of FEMA-acquired property remained vacant lots</li> <li>• Most participants believed the acquired lands had either no impact (n=65.2%) or a positive impact (n=18%) on their property values.</li> <li>• Those who believed open land had no impact belief were more likely to be people who resided in the neighborhood prior to the acquisitions.</li> <li>• In two neighborhoods, 16-17% of the respondents were dissatisfied with the conditions of the open space and had low utility.</li> </ul>	Town officials should work with the community to decide exactly what will be done with acquired property rather than let it sit.

(continued)

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<p>Zavar, E., &amp; Hagelman, R. R. I. (2016). Land use change on U.S. floodplain buyout sites, 1990-2000.</p>	<p>Assesses the land use patterns in 333 HMGP-funded property acquisitions between 1993 and 2000.</p>	<ul style="list-style-type: none"> <li>• Two of the biggest challenges to managing acquired land are (1) maintenance of the land, and (2) costs associated with the management</li> <li>• There are inconsistent efforts of engaging the community with land conversion decisions</li> <li>• 34.2% of the assessed sites remained as vacant lots (mowed grass or bare soil) and many were found scattered in between private properties (checkerboard pattern)</li> </ul>	<p>Town officials should work with the community to decide exactly what will be done with acquired property rather than let it sit. A plan for land management should also be prepared.</p>
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**Table 4. Summary of Articles Related to People**

Article Information	Overview of Article	Key Findings	Implications for Best Practices
<p>Bukvic, A. (2015). Integrated framework for the Relocation Potential Assessment of Coastal Communities (RPACC): application to Hurricane Sandy-affected areas.</p>	<p>Proposes social/physical vulnerabilities metrics for a framework designed to inform whether to rebuild or relocate from coastal areas after a disaster.</p>	<p>The author proposes that coastal communities should engage in a dialogue to consider buyouts that includes:</p> <ul style="list-style-type: none"> <li>• Anticipated projected impact and future risks (both episodic and chronic, like sea level rises)</li> <li>• Metrics on water, electric, transportation, sewage, and other critical capacities during and after a disaster</li> <li>• Public health and well-being consequences (e.g., soil contamination)</li> <li>• Evidence or lack thereof of local capacity to help volunteers relocate through financial, legal, technical, or institutional support</li> <li>• “inputs on recovery progress and challenges” and the ability to fully restore the built environment and resilience</li> </ul>	<p>There is no evidence for the effectiveness of the tool. However, the topics and data for dialogue could be significant with helping those who have lost their homes make an informed decision.</p>

(continued)

Article Information	Overview of Article	Key Findings	Implications for Best Practices
<p>Bukvic, A., &amp; Owen, G. (2017). Attitudes towards relocation following Hurricane Sandy: should we stay or should we go?</p>	<p>Evaluates the attitudes and perceptions of 46 households that considered, but did not opt for, buyouts after Hurricane Sandy; explores perception of risks and motivations to relocate.</p>	<ul style="list-style-type: none"> <li>• Residents preferred to invest in structural improvements rather than relocate</li> <li>• People would consider relocating primarily for “the health and safety of myself and/or my family” (73%) according to the survey</li> </ul>	<p>Communities with a history of damaging natural disasters should consider engaging in short- and long-term conversations about future risks to elevate residents’ awareness.</p>
<p>De Vries, D. H. , &amp; Fraser, J. C. (2012). Citizenship rights and voluntary decision making in post-disaster U.S. floodplain buyout mitigation programs.</p>	<p>Explores the choice to volunteer for buyouts through interviews with hazard mitigation officials, and property owner surveys.</p>	<ul style="list-style-type: none"> <li>• There is a lack of consistency with people’s experiences of the buyout process and feelings of voluntariness. People who opt for buyouts often feel pressured to participate, thereby being less trustful of buyout managers.</li> <li>• From the communities studied, places with high buyout participation rates also had a high presence of groups with low social capital.</li> <li>• Homeowners who were allowed to return to their homes after a disaster were less likely to accept a buyout offer.</li> </ul>	<p>The study raises questions about the perceived voluntary nature of buyouts. If a town creates a buyout program, officials should consider the effects certain buyout policies and politics might have on residents’ participation.</p>

Article Information	Overview of Article	Key Findings	Implications for Best Practices
<p>McGhee, D. (2017). Were the Post-Sandy Staten Island Buyouts Successful in Reducing National Vulnerability?</p>	<p>Quantifies the outcomes of the Staten Island buyout by studying the relocation patterns of 323 buyout participants.</p>	<ul style="list-style-type: none"> <li>• Ninety-nine percent of participants had increased exposure and social vulnerability. Exposure vulnerability is a risk score that measures a "buyout participant's exposure to the physical impacts of coastal flood hazards before and after participation in the program" (p. 23). This risk did not decrease for anyone who participated in the program.</li> <li>• Most buyout participants relocated within 5 miles of their original home (65%), often in denser communities, in higher</li> </ul>	<p>Governments should consider setting restrictions on relocations. If buyout participants relocate to a community within a 100-year floodplain, then the buyout program might not be effective.</p>
<p>Muñoz, C. E., &amp; Tate, E. (2016). Unequal recovery? Federal resource distribution after a Midwest flood disaster.</p>	<p>Compares the recovery differences between buyouts funded by HMGP and by Community Development Block Grants (CDBG) following the June 2008 flooding in Iowa.</p>	<ul style="list-style-type: none"> <li>• Buyout process can take months to years to complete. Even though HMGP-funded buyout were completed faster than CDBG-funded buyouts, the HMGP buyouts still took more than a year to complete.</li> <li>• Hispanics and the elderly have significantly lower than average recovery rates based on the appraisal value of their homes, making it more difficult to find affordable housing in places outside the floodplain.</li> </ul>	<p>Increase transparency with the buyout process. Officials should provide estimates on anticipated length of the program.</p> <p>Local government officials should consider additional measures to ensure communities with lower social capital recover just as quickly as their counterparts.</p>

(continued)

Article Information	Overview of Article	Key Findings	Implications for Best Practices
<p>Smith, G. P. (2014). Applying Hurricane Recovery Lessons in the United States to Climate Change Adaptation: Hurricanes Fran and Floyd in North Carolina, USA.</p>	<p>Identifies lessons from recovery efforts in North Carolina after Hurricanes Fran and Floyd.</p>	<ul style="list-style-type: none"> <li>• After Hurricane Floyd in eastern North Carolina, areas that participated in buyouts saw a further decrease in affordable housing.</li> <li>• Government officials often coordinate the buyout process but continue to allow development in other flood-prone areas that put future residents at risk.</li> </ul>	<p>It is crucial for local governments to engage in “pre-event planning for post-disaster recovery and hazard mitigation” (p. 214).</p>

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