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The National Flood Insurance Program: Maintaining Its Head Above Water

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THE NATIONAL FLOOD INSURANCE PROGRAM: MAINTAINING ITS HEAD ABOVE WATER

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SUMMARY

National flood insurance programs implement flood prevention, create flood zone land-use policy, and establish protocols for relief. With climate change and development raising the risk and exposure of human populations to flood, the United States' National Flood Insurance Program (NFIP) has been heavily scrutinized, especially in the wake of Hurricane Katrina. This article examines the validity of the two main criticisms of NFIP, and seeks to inform a better understanding of NFIP's integrity through a comparative analysis between NFIP and several different flood insurance models in Europe. As a result, this analysis yields recommendations that can benefit NFIP, as well lives and properties vulnerable to flood risk in the United States.

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"In Nature, there is no flood damage."[1]

A. INTRODUCTION

Fundamentally natural events, "[f]loods only lead to damage when uses by human beings are detrimentally affected. The more intensively and the less suitably the flood basin is used, the greater the potential for damage and then the actual damage when flood occurs."[2] Furthermore, as the most frequent natural disaster in the world, flooding accounts for the greatest human and economic losses in the world.[3]

Floods are increasing in frequency and severity due to both climate change and development that is catalyzed by a growing and expanding human population. The prevalence of floods[4] makes it impractical to relocate all human settlement away

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[1] *Best Practices on Flood Prevention, Protection and Mitigation*, 19 (2004) (updating the United Nations and Economic Commission for Europe (UN/ECE) Guidelines on Sustainable Flood Prevention (2000)), *available at* http://www.floods.org/PDF/Intl_BestPractices_EU_2004.pdf [hereinafter *Best Practices*].

[2] *Id.*

[3] M. Kok, J.K. Vrijling, P.H.A.J.M Van Gelder & M.P. Vogelsang, *Risk of Flooding and Insurance in The Netherlands*, *in* FLOOD DEFENCE: PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM ON FLOOD DEFENCE , VOLUME II 146, 147 (Wu et al. eds., 2002).

[4] "Flooding is the most common natural disaster in the United States. Most homeowners insurance does not cover flood damage. Floods and flash floods happen in all 50 states. . . . Every year, flooding impacts thousands of property owners across the United States. Most of them don't expect it because their property 'isn't in a flood zone.' The truth is: Everyone lives in a flood zone. Just because a property has a low risk of flooding doesn't mean there's no risk. Flooding can happen anywhere at any time, whether it's a flash flood from heavy rains in the desert, an overflowing river, or simply water with nowhere to go because of urban construction. One in four insurance claims for flood damage comes from low-to-moderate risk flood zones. Properties in high-risk flood zones have a 26% chance of flood damage over the period of a 30-year mortgage." First American Flood Data Services, *Flood Basics*, http://www.freaflood.com/flood/basics/ (last visited Nov. 12, 2007).

from flood risks; thus it is imperative to explore ways to reduce the destruction caused by floods.

Beyond the purview of legislation that directly regulates flood zone management, flood insurance programs provide an especially important vehicle for the implementation of flood prevention and flood zone land-use policy and relief. By examining the validity of the criticisms of United States' National Flood Insurance Program ("NFIP"), especially in the aftermath of Hurricane Katrina, this paper will compare NFIP to different flood insurance models in Europe - the United Kingdom, France, Germany, and the Netherlands - in terms of (1) governmental role, (2) mitigation of flood risks, and (3) participation of the national population. Compared to its European counterparts, from a policy standpoint, NFIP provides a progressive and comprehensive flood management program. Nonetheless, a comparative analysis of European flood insurance models yields several improvements that could benefit NFIP, as well as the lives and properties at risk in the United States.

B. DESIRABILITY AND CHALLENGES OF FLOOD INSURANCE

1. Why have flood insurance in the first place?

Society is challenged with promoting behavior and investments in flood risk reduction, while placing the burden of compensation on those who suffer the most and mitigate flood risks the least.[5] Policy-wise, "[flood] insurance is one the most effective policy tools for achieving both objectives, because it rewards investments in cost-effective mitigation with lower premiums and provides indemnifications should a disaster occur."[6]

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[5] Howard Kunreuther, *Mitigating Disaster Losses through Insurance*, 12 JOUR. RISK & UNCERT. 171, 180 (1996).

[6] *Id.* at 180. The article notes as follows: "[t]his presumes that both homeowners and insurers are aware of state-of-the-art technologies and can determine what impact they will have on reducing expected losses from future disasters." *Id.* at 185.

Additionally, flood insurance can reduce post-disaster governmental assistance funded by taxpayers because flood insurance premiums can provide an independent and significant source of funding. Furthermore, when the availability of flood insurance is tied to the enforcement of flood-risk reduction, land-use activity and construction, flood insurance can reduce the need for - or amount of - post-disaster governmental assistance for relief, recovery, and reconstruction.[7]

II. Centralized risk and skewed risk perception make it difficult to sustainably provide flood insurance.

In order for an insurer to compensate an insured party for a loss resulting from an event, the insurer must "amass relatively small contributions, premiums, from many persons who are exposed to risk of occurrence of an unforeseen event in order to create a fund to reimburse those clients who actually suffer from such an occurrence."[8]

Flood events threaten the sustainability of flood insurance given the difficulty of predicting floods and the high human and economic tolls of flood disasters.[9] Independence of events assures that funding is not depleted with one occurrence, which is the main difficulty of providing flood insurance because when many properties are damaged by the same event, funds may be heavily tolled, thus jeopardizing the ability of an insurer to pay out claims and continue to provide coverage.[10] Additionally, funds to pay out claims are even more threatened by the adverse selection of individuals who live in high flood risk zones, realize the risk of flood, and thus dominate flood insurance policies.[11]

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[7] NFIP HANDBOOK FOR RHODE ISLAND COMMUNITIES, at 1 *available at* http://www.planning.state.ri.us/nfip/pdf/nfip.pdf (last visited Nov. 25, 2007) [hereinafter NFIP RI].

[8] M. Kok, et al., *supra* note 3, at 147.

[9] *See* Kunreuther, *supra* note 5, at 178.

[10] *See* Kok, *supra* note 3, at 147.

[11] "The people most likely to buy insurance against flood losses are also the most likely to suffer them. That is, the motivated pool of actual insurance consumers is generally more risky than the pool of all potential consumers.

Although the difficulty in spreading risk deters potential providers, flood insurance is not necessarily unsustainable. In order to assure the independence of events, insurance can be spread over many different types of flood zones and areas, such as river and lake basins, and coastal areas.[12] Also, re-insuring flood risk with other catastrophic events adds another layer of risk spreading for insurers.[13]

Skewed flood risk perception and expectations of governmental disaster assistance exacerbate the difficulty of spreading the risk of flood over populations.[14] Often individuals perceive the probability of a flood "causing damage to their home as being sufficiently low that the investment in [a] protective measure will not be justified."[15] This results in deterring people from investing in flood insurance or activity that would reduce flood damage, such as retreating from potential flood zones.

Conversely, insuring against flood damage may lead to moral hazard: insured individuals perceive that they and their properties are insulated from risk and devastation. This may inadvertently encourage inappropriate development (and redevelopment) in flood zones.

Adverse selection occurs when insureds know more about their risk profiles than their insurers. . . . Adverse selection has long been thought capable of creating a 'death spiral' in which an unfortunate insurance pool begins to attract riskier insureds and to deter good risks – because the former are getting a good deal and the latter are overpaying. In theory, such a pool will eventually collapse, as the necessary rise in premiums reshapes the pool into an increasingly narrow band of highly risky consumers who (at some point) can no longer afford the actuarially correct premium." Adam F. Scales, *A Nation of Policyholders: Governmental and Market Failure in Flood Insurance,* 26 MISS. C. L. REV. 3, 8-9 (2006).

[12] Kok, *supra* note 3, at 147.

[13] *Id.*

[14] *See* Kunreuther, *supra* note 5, at 177.

[15] Kunreuther, *supra* note 5, at 175.

C. BASIC CHARACTERISTICS OF VARIOUS FLOOD INSURANCE MODELS

Across the globe, flood insurance programs come in numerous combinations of policies. Nonetheless, flood insurance programs can roughly be identified by the following characteristics:

1. Primarily private or public insurance
2. Mandatory or voluntary insurance
3. Available compensation schemes by the government:
    A) none or vague
    B) *ad hoc*
    C) by law[16]

An analysis of the flood insurance programs in the United States, United Kingdom, France, Netherlands, and Germany illuminates the advantages and disadvantages of the various characteristics listed above, and provides a foundation to make recommendations for a more effective flood insurance program in the United States.

D. NATIONAL FLOOD INSURANCE PROGRAM

I. Background and mechanics

The United States' National Flood Insurance Program, 42 USC §§ 4001 *et seq.* ("NFIP"),[17] is an example of public flood insurance, which was enacted in 1968 as the government's "primary tool for managing flood hazards through a combination of incentives and regulations."[18] Before NFIP's enactment, flood insurance in the United States was prohibitively expensive or

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[16] *See generally* Kok, *supra* note 3, at 148 (categorizing flood insurance solutions based on an analysis of programs in nineteen countries).

[17] The National Flood Insurance Act of 1968, as amended, and The Flood Disaster Protection Act of 1973, as amended, 42 U.S.C. §§ 4001-4129 (2005).

[18] U.S. COMMISSION ON OCEAN POLICY, *Guarding People and Property against Natural Hazards*, *in* AN OCEAN BLUEPRINT FOR THE 21ST CENTURY, 121, 125 (2004).

unavailable for most high risk flood property.[19] Also, before NFIP, flood victims depended on "federal, taxpayer-financed, *ad hoc* disaster assistance."[20] By creating NFIP, Congress intended to primarily "alleviate the heavy financial burdens and economic distress that recurring flooding has often created for individuals, local economic and for the nation as a whole."[21]

NFIP operates as a partnership, requiring cooperation between local municipalities (or more generally, communities), the Federal Emergency Management Agency ("FEMA"), and property owners.[22] In order to receive NFIP coverage, communities must agree to adopt and administer local floodplain management aimed at protecting lives and property from future flooding. Specifically, Section 4022 of Title 42 of the United States Code prohibits flood insurance coverage as authorized under the NFIP, "unless an appropriate public body shall have adopted adequate land use and control measures (with effective enforcement provisions)" determined by the local NFIP Director.[23]

Critical for the enforcement of NFIP land use policy, FEMA provides local communities with four types of informational documents: the (1) Flood Hazard Boundary Map, the (2) Flood Insurance Study, the (3) Flood Insurance Rate Map, and the (4) Flood Boundary-Floodway Map.[24]

II. Flood Boundary Map

The Flood Hazard Boundary Map ("FHBM") is a basic map provided by FEMA and given to a community when it joins the initial, or Emergency Phase of NFIP, which provides a preliminary delineation of the 100-year floodplain, also known as

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[19] NFIP RI, *supra* note 7, at 1.
[20] Jason Thomas, Comment, *National Flood Insurance Program: Crisis and Renewal* 4 (George Washington University, Working Paper Series, 2006), *available at* http://ssrn.com/abstract=989850 [hereinafter *Crisis and Renewal*].
[21] NFIP RI, *supra* note 7, at 1.
[22] *Id.*
[23] 42 U.S.C. § 4022 (2005).
[24] NFIP RI, *supra* note 7, at 8.

a "Special Flood Hazard Area" ("SFHA") or base flood, in a community.[25]

The 100-year floodplain does not mean that a flood occurs in these zones only once every 100 years.[26] Rather, the 100-year flood refers to the probability that a given event has a one-in-one hundred chance (1 percent) of occurring in any given year.[27] Communities in SFHAs are required by NFIP to both undertake the program's floodplain management regulations and also purchase insurance.[28]

III. Flood Insurance Study

In conjunction with local officials, FEMA reports on its examination, evaluation, and determination of flood hazards for participating NFIP communities in its Flood Insurance Studies ("FISs").[29] FISs provide background on a community's flooding history, and, where applicable, include: "stream profiles [and] coastal transects used to calculate water surface elevations for various flooding conditions, including the 100-year flood. Data on the width, base flood elevation, and cross-sectional area of

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[25] *Id.* at 11.

[26] *Crisis and Renewal*, *supra* note 20, at 9.

[27] *Id.* Furthermore, when the probabilities of flood are compounded, "[a] '100 year' flood has a 9.6 percent chance of occurring in 10 years, a 22 percent chance of occurring in 25 years, a 39 percent chance of occurring in 50 years, and an 86 percent chance of occurring in 100 years. Moreover, to reliably predict a 100-year recurrence event, geologists 'would need 1,000 years of records, which they do not have. Flood predictions, like those of the weather, depend on a unique set of environmental variables which are almost never repeated.' Based on participation rates, it seems unlikely that most residents of a '100 year floodplain' realize that structures located there have a 26-percent chance of being flooded over the course of a 30-year mortgage, compared to a 4-percent chance of fire over the same period. Yet homeowners who avoid 'costly' flood coverage are unlikely to avoid fire insurance, even absent lender requirements." *Id.* (internal citations omitted).

[28] Federal Emergency Management Agency, *Special Flood Hazard Areas*, *available at* http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/sfha.shtm (last visited Nov. 17, 2007).

[29] NFIP RI, *supra* note 7, at 11.

floodways are also given in the FIS for each stream segment studied in detail."[30]

The most important characteristic of FISs is that these studies inform and lead to the production of Flood Insurance Rate Maps and Flood Boundary-Floodway Maps.[31] These maps form the basis of a community's floodplain management activity by providing critical information on flood zones for potential lenders of construction/re-construction projects and insurers.[32]

IV. Flood Insurance Rate Map

Flood Insurance Rate Maps ("FIRMs") signal a community's transition from the Emergency Phase to the Regular Phase of NFIP. Compared with FHBMs, FIRMs generally have more detailed floodplain content and accuracy.[33] Also, FIRMs are the most widely distributed flood map.[34]

In FIRMs, base flood elevations are denoted in conjunction with categorizations within SFHAs. Unlike the content in FHBMs, within FIRMs, SFHAs and other areas are further refined into zones, depending on the severity of flood risk and the type of flood risk present (e.g., coastal, riverine) which are identified by the following letters: A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V.[35]

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[30] *Id.*

[31] *Id.* at 10.

[32] *Id.*

[33] Federal Emergency Management Agency, *National Flood Insurance Program (NFIP) Flood Maps,* http://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=productFIRM&title=NFIP%20Flood%20MAPS&parent=productInfo&parentTitle=Product%20Information (last visited Nov. 18, 2007).

[34] *Id.* Note also that the information on FIRMs "is based on historic, meteorologic, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development." *Id.*

[35] *Id.*; *see also* Federal Emergency Management Agency, *Definitions of FEMA Flood Zone Designations,* http://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%20Flood%20Zone%20Designations.

These distinctions inform community officials, insurance agents, lenders, and both federal and state agencies on the nature and estimates of high-risk flood areas throughout a community.[36] Properties located in mapped zones AE, AO, A, or VE are required to have flood insurance if the owner has a federally backed mortgage on the property.

V. Flood Boundary-Floodway Map

Finally, FEMA's Flood Boundary-Floodway Maps (FBFMs) "delineate the boundaries of designated floodways within which local officials must enforce the NFIP's floodway non-encroachment standards... FBFMs also indicate the locations and designations of stream cross-sections."[37] Since 1986, FBFMs have been incorporated into FIRMs.[38]

Equipped with FEMA's studies and maps detailing their flood history and estimated flood risk, communities can make better-informed decisions about applying for NFIP insurance and committing to its land management regulations,[39] if not already required. Impressively, "[o]ver 20,000 communities in all 50

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[36] NFIP RI, *supra* note 7, at 12. Specifically FIRMs "provide data needed to identify areas subject to flooding, determine the base flood elevation and flood risks of specific properties, locate reference marks needed to establish the elevation of specific sites, and locate the boundaries of floodways." *Id.* at 12.

[37] *Id.* at 15.

[38] *Id.*

[39] The most basic examples of NFIP land management are:

> 1) required permits for all development, and within A or V zones, required delineation of the 100-year flood boundary and provision of base flood and structural component elevation data on site plans
> 2) determination if proposed development has received other necessary permits
> 3) prohibition of development or encroachment within designation floodways
> 4) prohibition the modification of sand dunes in V-Zones
> 5) location and construction of utilities to eliminate or minimize flood damage
> 6) required elevation of newly constructed or substantially improved elevation above or at the base (100 year) flood elevation. *See id.* at 21-39.

States, representing about 95 percent of the highest risk floodplains, participate in the NFIP. The NFIP is now the nation's largest single-line property insurer in the United States, with 4.8 million policies insuring in excess of $800 billion in assets."[40] Without NFIP, it is likely that most of these policy-holders would not have had the incentive to develop active programs to manage flood risks.[41]

E. CRITICISMS OF THE NATIONAL FLOOD INSURANCE PROGRAM

Despite FEMA's mandatory requirement of flood insurance and compliance with NFIP regulations in high flood-risk zones and its encouragement of participation in NFIP in other communities, NFIP faces several challenges in being as effective as possible. The two main criticisms of NFIP are that 1) NFIP exacerbates skewed risk perception, worsening the moral hazard[42] of flood insurance, and 2) it is not actuarially sound due to subsidized insurance premiums and the toll of repetitive-loss properties, threatening the sustainability of the program.

1. Risk perception

Despite the proactive flood risk mapping undertaken by FEMA and its contracted experts, the flood maps are based on estimates. Actual rainfall, coastal storms, or other events that lead to flooding may be more or less frequent and severe than expected. The potential mismatch between FEMA estimates and actual flood events has three negative consequences.

The first consequence is that individuals outside the highest risk zones, SFHAs, in FEMA's FIRMs are not required to obtain flood insurance and comply with NFIP, resulting in the

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[40] *Crisis and Renewal*, *supra* note 20, at 5.

[41] *Guarding People*, *supra* note 18, at 167.

[42] "Moral hazard" may be defined as "the disincentive that being insured removes to engage in the conduct insured against." *Wausau Underwriters Insurance Company v. United Plastics Group Inc.*, 512 F.3d 953, 959 (7th Cir. 2008).

misperception that they are immune to floods.[43] This perceived immunity results in lower investment in land use and control programs, flood insurance, and general awareness of flood risks that may not be captured by FISs and FIRMs. Unfortunately, too many individuals are caught unprepared when their communities are flooded, as "[n]ationwide, one-third of the flood loss claims are from property located outside of the mapped 1% (100-year) floodplain."[44]

The second consequence is that this false sense of immunity may also impact individuals who do have flood insurance but their communities have been flood-free for a number of years. These communities may view their recent flood-free experience as indicators of future flood risk and evidence that FEMA over-estimated flood risk. Too often, individuals with flood insurance cancel their "policies if they have not made a claim after a few years."[45] An estimated one in every five policyholders under NFIP cancels their coverage each year.[46]

The third consequence of the limitations of FISs and FIRMs to estimate actual flood events is that individuals who do live in high-risk flood zones may perceive that compliance with NFIP regulations is enough to protect themselves and their property from loss. Assuming that flood threats are sufficiently mitigated, this sense of immunity thwarts retreat from high risk flood zones.

Too often the assumption that compliance with NFIP sufficiently protects against the unpredictability of nature is coupled with the expectation that the government, either through

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[43] *Crisis and Renewal*, *supra* note 20, at 9.

[44] Tropical Storm Allison Recovery Project, *Flood Insurance Rate Maps* (Nov. 2004), http://www.tsarp.org/downloads/FloodInsuranceRateMaps.pdf.

[45] Kunreuther, *supra* note 5, at 177. Furthermore, "[I]t would not be surprising to learn that many of these individuals purchased a policy at the time that they took out a mortgage but failed to renew their policy the next year or several years later after *not* experiencing any flood losses. The financial institutions issuing the mortgage would have had to have looked the other way." *Id.* at 177-78 (emphasis added).

[46] *Id.* at 177.

NFIP or *ad hoc* emergency relief, will compensate damage or loss[47] once a flooding disaster occurs. The main weakness of this assumption is that the government has a limited ability to pay for flood insurance claims given the limited ability of NFIP to fund itself.

II. Actuarial imbalance

National flood insurance is "available in high-risk areas where no private insurer would be willing to write policies...[encouraging] more people to locate in these areas, which has the effect of exposing more assets to flood risk and increases the total economic losses from flooding."[48] NFIP flood insurance is marketed by private insurers who deposit the premiums in a federally operated Flood Insurance Fund ("FIF"),[49] which pays all claims.[50] The flood insurance contract is written by NFIP, and published in the Federal Register, with no deviation permitted, and not generally governed by contract law.[51] Private insurers enjoy benefits of selling flood insurance policy by retaining 30 percent of premiums as commission, and being compensated for additional loss-adjustment claims.[52] However the government's control over the terms of flood insurance policy retards the ability of the flood insurance market from gaining the benefit of actuarially sound priced policies.

By design, FIF is not actuarially sound.[53] NFIP is 40 percent underfunded with approximately 26 percent of NFIP policyholders paying explicitly subsidized premiums.[54] When NFIP began, it lacked thorough flood data to inform its insurance rates.[55] Therefore NFIP decided to "subsidize policies within the

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[47] *See generally, id.*
[48] *Crisis and Renewal*, *supra* note 20, at 7.
[49] The National Flood Insurance Fund is described in 42 U.S.C. § 4017 (2005).
[50] Kunreuther, *supra* note 5, at 173.
[51] Scales, *supra* note 11.
[52] *Id.*
[53] Kunreuther, *supra* note 5, at 173.
[54] *Crisis and Renewal*, *supra* note 20, at 5.
[55] Scales, *supra* note 11, at 15.

pool of flood insurance consumers while undertaking to create the required data. These subsidies are substantial and reach deep into the risk pool." [56] However, NFIP has not phased out these subsidies within 25 years of its inception as originally planned.[57]

Also, during the first few years of NFIP (1968-1973), low participation rates among high flood risk communities resulted in "federal *ad hoc* disaster assistance payments remain[ing] largely unchanged, and land-use management techniques were not adopted on a large scale."[58] In response, Congress authorized NFIP to subsidize property constructed pre-FIRMs in order to induce participation.[59] This effectively grandfathered-in older properties. Not only did these older properties receive significant subsidies, "Congress also exempted owners of these subsidized, or 'pre-FIRM,' structures from the NFIP's floodplain management requirements, unless these structures are at some later point substantially damaged[60] or substantially improved. Either of those events then trigger[s] a requirement to rebuild to current construction and building code standards."[61] The justification for leniency towards grandfathered properties is that property built before the FISs and FIRMs were prepared for the areas in which they are located were not constructed or priced with flood risk in mind. [62]

In order to avoid compliance with NFIP's land use codes, grandfathered property owners resist investments in structural improvements that do not directly translate into higher home

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[56] *Id.* at 15-16.

[57] *Id.* at 16 (noting that in 2006 "38 years have passed, and approximately 28% of NFIP policies remain subsidized. This in facts reflect substantial progress, as the subsidization rate was originally 70%.").

[58] *Crisis and Renewal*, *supra* note 20, at 4.

[59] *Id.* at 5.

[60] A substantially damaged structure is one whose cost of repair (to bring it back to its pre-damaged condition) equals or exceeds 50 percent of the market value of the structure before the damage occurred. 42 U.S.C. § 4011 b(2) (2006); 44 C.F.R. § 59.1 (2007).

[61] *Crisis and Renewal*, *supra* note 20, at 5.

[62] Scales, *supra* note 11, at 16; *see also* Kunreuther, *supra* note 5, at 173.

prices.[63] This results in buildings that pre-date NFIP maps accounting for 90 percent of repetitive-loss payments.[64] Although this statistic "demonstrates the effectiveness and success of NFIP building standards for new construction in flood-prone areas," it "also underscores the program's lack of authority for reducing the vulnerability of older buildings."[65]

Another financial burden of repetitive-loss properties, whether or not they were grandfathered into NFIP, arises from challenges to local enforcement of NFIP after flood damage. Although NFIP requires that substantially damaged properties undertake land use and control measures such as removal or elevation,[66] local governments in charge of determining substantial damage are reluctant to qualify properties as such when property owners do not have the financial resources to move or elevate their property.[67]

The burden of repetitive-loss properties is clear: "[a]though only 2 percent of NFIP covered properties have received repetitive-loss payments, they account for 40 percent of overall NFIP payments, many at cumulative totals exceeding the property's value."[68]

Congress has addressed the issue of repetitive-loss properties with: 1) Section 4030 of Title 42 of the United States Code, which empowers local NFIP Directors with discretion to give grants for repetitive-loss properties to undertake mitigation action,[69] and 2) the Flood Insurance Reform Act of 2004. The Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of

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[63] *Guarding People*, *supra* note 18, at 168.
[64] *Id.*
[65] *Id.*
[66] *Id.*; 44 CFR § 60.3(c)(2).
[67] *Guarding People*, *supra* note 18, at 126.
[68] *Id.* Interestingly, "[a]lthough a national problem, between 1978 and 1995, Louisiana and Texas accounted for $1.1 billion, or 40 percent of the $2.75 billion in total repetitive-loss claims paid by the NFIP." *Id.*
[69] 42 U.S.C. § 4030 (2005).

2004 (FIRA)[70] reforms NFIP to disincentivize property owners from living in repeatedly flooded areas. Instead of providing insurance compensation for rebuilding, FIRA provides repetitive-loss property owners assistance in either elevating or moving their homes away from flood waters. Those who refuse mitigation assistance would pay the full actuarial costs for remaining to live in a high risk flood area.[71] Although proactive in addressing the repeated claims of repetitive-loss properties, enforcement of both Section 4030 of Title 42 of the United States Code and FIRA are costly, illustrating the burden of repetitive-loss properties.

NFIP's accounting method compounds the burden of repetitive-loss properties and subsidies, impacting the viability of the entire program. Using a cash-based method for accounting and determining premiums, the program is not structured to establish a reserve for significant losses in especially heavy flood years.[72] "Instead, total premium income is preset annually to match a moving twenty-five year average annual loss experience."[73] This preset results in oscillating and unstable finances, and budgeting that understates true flood liabilities. With NFIP's statutory borrowing authority, both of these phenomena threaten to pass flood losses onto taxpayers, undermining the purpose of NFIP.[74]

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[70] Flood Insurance Reform Act of 2004, P.L. 108-264, 118 Stat. 712 (codified as amended in scattered sections of 42 U.S.C. §§ 4001 et seq. (2005). The act was called "Two Floods and You Are Out of the Taxpayers' Pocket Act of 2003" when introduced to the House of Representatives in 2003.

[71] Rawle O. King, *Federal Flood Insurance: The Repetitive Loss Problem*, CONGRESSIONAL RESEARCH SERVICE REPORT FOR CONGRESS, June 30, 2005, at 31.

[72] Scales, *supra* note 11, at 15.

[73] *Id.* at 16.

[74] *Id.*

F. THE UNITED KINGDOM'S GENTLEMAN'S AGREEMENT

Unlike the United States' National Flood Insurance Program, the UK has a much less formalized approach to flood insurance, described as the "Gentleman's Agreement" between the government and private insurance industry.[75] The Gentleman's Agreement divides responsibility between the government, which provides flood defenses, and insurers, which compensate property owners when there is flood damage.[76] It is not an "explicit regulatory regime but an invisible set of rules governing overall flood management."[77]

The Gentleman's Agreement is governed by a substantially different policy than NFIP.[78] Specifically, under the Gentleman's Agreement: 1) private insurance is not associated with land use measures,[79] 2) the insurance industry guarantees to provide insurance for all (with premiums not to exceed one-half percent of the sum insured),[80] and 3) flood insurance is mandatory and pooled with other risks.[81]

I. Disconnect between insurance and land use policy

Historically, the UK experiences flooding regularly in many areas, however "the threat of floods is not taken seriously."[82] Despite the increasing number of people exposed to flood risk, "the awareness about the economic and social consequences is hardly developed."[83] The disconnect between flood vulnerability, public awareness of the risk, and land use regulation impedes prevention and mitigation of flood disaster in

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[75] *See* Michael Huber, *Reforming the UK Flood Insurance Regime, The Breakdown of a Gentleman's Agreement*, ECONOMIC AND SOCIAL RESEARCH COUNCIL CENTRE FOR ANALYSIS OF RISK REDUCTION (2004).
[76] *Id.* at 2.
[77] *Id.*
[78] *Id.*
[79] *Id.* at 2, 4.
[80] *Id.* at 4.
[81] *See generally* Huber, *supra* note 75.
[82] *Id.* at 4.
[83] *Id.*

the UK, contrasting NFIPs attempt to affect and improve land use policy in light of flood risk.[84]

II. Guaranteed insurance

Private flood insurers in the UK may guarantee insurance, but not without qualifications. Private insurers can decline insurance for property regularly exposed to flooding, which is akin to "repetitive-loss" properties. However, there is no written agreement with the government that allows insurers discretion to withhold insurance or charge especially high premiums in order to reflect the risk of repetitive-loss properties.[85]

Also, the Gentleman's Agreement implicitly makes the government responsible for providing sufficient flood protection.[86] However, no provisions exist that define the sufficiency of flood protection, or financial commitments required by the government assumed in this agreement.[87] In recent years, lacking a vested interest in the provision of flood insurance policies or investments in the payouts of claims, the UK government has reduced investments in flood management.[88]

Private insurers bear huge potential losses for the government's failure or negligence in providing adequate flood defenses, which also avoids the responsibility of being an insurer of last resort.[89] The distinct division of responsibility between insurance provision and flood management and protection has failed to mobilize the UK government to address flood losses or engage in more proactive and socially beneficial policy-making.

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[84] *See generally, id.*
[85] *Id.* at 5.
[86] *Id.*
[87] *Id.*
[88] *Id.* at 7.
[89] *Id.* at 5. The UK government has, in rare instances, assisted flood victims, and for example has provided "minimal help to flood victims in a poor, and under-insured area." *Id.* at 7.

III. Mandatory and pooled insurance

Instead of experiencing an actuarial imbalance like the United States' NFIP, private flood insurers in the UK maintain their financial viability despite a lack of support from or burden on the government. UK flood insurers achieve this sound economic foundation through a bundled and compulsory system. Flood hazards in the UK are bundled with all natural hazards, which diversifies the risk and helps protect against one singular event from giving rise to a deluge of claims. Further, flood insurance in the UK is mandatory: mortgages are withheld from potential homeowners unless there is full coverage for flood and other natural disasters. Mandatory flood insurance among all property owners, who face varying levels of flood risk, helps spread risk across the population.

Under the Gentleman's Agreement, the main disadvantage of mandatory and pooled flood insurance is that the "insurance industry has insufficient incentives to identify weakness in flood defence, patterns of individual behavior or their internal costs structure as they subsidise costs across natural perils and the entire insurance population."[90] Simply, moral hazard plagues the sustainability of the Gentleman's Agreement. Despite increasing flood risks,[91] there is not enough mobilization among the government or private insurers in the UK to identify flood risks and minimize them.

G. FRANCE

In contrast to the UK flood insurance system, the French flood insurance program attempts to incentivize individuals and the government to be aware of flood risks and engage in flood mitigating activity. At the same time, the French program faces its own challenges.

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[90] *Id.* at 8.

[91] *See* Hilary Osborne, *Flood Damage Could Hit £16bn, Warns Insurer*, GUARDIAN UNLIMITED, Nov. 7, 2006, *available at* http://www.guardian.co.uk/environment/2006/nov/07/water.homeinsurance (last visited Nov. 26, 2007).

I. Flat rates, but deductibles available

French flood insurance is mandatory as it is in the UK, and is similarly pooled with other natural hazard risks. However the main drawback of flood insurance in France is that there is no premium differentiation,[92] which reduces incentives for individuals to live in low-risk flood areas due to lower, more attractive premiums, as in the US and UK. To overcome this disincentive, insurers provide "deductibles, to stimulate loss-reducing measures."[93]

II. Governmental role

Compared to the dominating role of the local, state, and federal governments in NFIP and the disassociation of the UK government in the Gentleman's Agreement, flood insurance in France aims to achieve a balanced public-private partnership. Private insurance companies collect premiums, and handle claims.[94] The government protects the solvency of these companies as insurer of last resort, willing to pay claims in excess of the capabilities of private insurers, setting this coverage by law.[95] However, the government only steps in to compensate flood damage when it "officially recognizes the flood as a disaster and the area where the damage occurred as a disaster area."[96] Because the definition of disaster is unclear, and it is vague when and if the government will provide flood assistance, some individuals obtain private insurance outside of the public-private partnership.[97]

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[92] W.J.W. Botzen & J.C.J.M. van den Bergh, *Insurance Against Climate Change and Flooding in the Netherlands: Present, Future and Comparison with Other Countries*, 28 RISK ANALYSIS 413, 419 (2006).
[93] *Id.*
[94] *Id.*
[95] *Id.*
[96] *Id.*
[97] *Id.*

H. GERMANY

Compared to the flood insurance programs in France, the UK, and the US, flood insurance in Germany is the least effective in encouraging awareness of flood risks and pro-action to mitigate losses. Flood insurance in Germany is available from private insurance companies and bundled with other natural disasters like earthquakes.[98] However, this flood insurance excludes coverage of damage from storm surges,[99] and acts primarily to supplement either home contents or building insurance.[100]

I. Low market penetration

Severely low market penetration, ten percent for home contents and four percent for residential buildings, thwarts efforts to spread risk over a large population.[101] Furthermore, achieving diversified risk for insurance companies is a challenge because adverse selection distorts the pool of flood insurance policyholders. At the same time, flood insurance is not available for buildings in the most flood hazard prone areas, and, if available, comes at especially high premiums.[102]

Despite adverse selection challenges to the viability of private flood insurance in Germany, flood insured households have "tended to be even better informed about mitigation and

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[98] Annegret H. Thieken et al., *Insurability and Mitigation of Flood Losses in Private Households in Germany*, 26.2 RISK ANALYSIS 383, 386 (2006).

[99] *Id.*

[100] Botzen, *supra* note 92, at 423.

[101] *Id.* However, low market penetration in Germany is not uniform. "There are two regions with a higher-insurance density: Baden-Wuerttemberg and the territory of the former German Democratic Republic (GDR). Flood loss compensation was generally included in mandatory building insurance in Baden-Wuerttemberg until 1994. Due to EU regulations this monopoly insurance had to be abandoned. Currently more than 80% of the property owners in Baden-Wuerttemberg still have flood insurance coverage. Flood loss coverage was also provided by the household insurance in the former GDR...thirty to fifty percent of people in the new German states (former GDR) still have comparable contracts." Thieken, *supra* note 98, at 387 (internal citations omitted).

[102] Botzen, *supra* note 92, at 423.

tended to flood proof their building more often than uninsured households."[103]

II. Ad hoc governmental compensation

Exacerbating the high risk of flood loss in Germany is the uncertainty of the extent of governmental aid in the aftermath of a flood disaster. Although governmental recognition of flood disaster in France follows vague guidelines, the French government at least has clear rules, set by law, for distributing disaster assistance once a flood disaster is determined. In contrast, German governmental aid for flood disaster leaves property owners exposed to uncertainty of their losses because government aid "is not based on formal legislation . . ."[104] Instead, flood disaster compensation is distributed *ad hoc*, and can depend "for example, on the extent of the disaster or the media coverage."[105]

In Germany's recent history, for instance with the August 2002 flood in the catchment areas of the Elbe and Danube rivers, the government provided extensive compensation for both insured and uninsured households. As a result of the flood, "total losses in Germany were estimated at 11.6 billion euro, of which only 1.8 billion were covered by insurance."[106] Extensive governmental aid helped fuel redevelopment, but at the same time disincentivized uninsured individuals to purchase flood insurance and prepare for future loss.[107]

Additionally, a lack of awareness and information about flood risks among individuals and insurers impedes German flood loss mitigation and preparedness. At the very minimum, flood insurance needs to be encouraged and this should be combined with loss mitigation.[108]

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[103] Thieken, *supra* note 98, at 390.
[104] *Id.* at 384.
[105] *Id.*
[106] *Id.* at 383.
[107] *See id.* at 390.
[108] *Id.* at 392-394.

I. NETHERLANDS

The majority of damage and loss arising from Germany's 2002 flood were sustained in the public sector (fifty-five percent), with "enormous damage to infrastructure."[109] This suggests that like private individuals, the German government did not proactively prepare against flood events. In contrast, the Netherlands almost entirely invests in flood prevention and loss through flood defense, and neither private nor public insurance, in a traditional sense, is available for flood risk.[110]

I. Non-existent traditional flood insurance

In a country where seventy percent of properties lie below sea or river water level,[111] flood risk in the Netherlands has been considered uninsurable by private insurers since the Dutch North Sea Flood of 1953.[112] Also, the government's general reluctance to compensate for flood loss, or be an insurer of last resort, has made

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[109] *Id.* at 383.

[110] Botzen, *supra* note 92, at 414, 416. One exception is private motor-hull insurance, which insures flood damage to cars. *Id.* at 416, n.7.

[111] M. Kok et al., *supra* note 3, at 148.

[112] *Id.* at 149; *see also* Botzen, *supra* note 92, at 414. "There is no flood insurance since the flood event in 1953, because after the event it was realized that insurance companies can become bankrupt if they continue to cover the flood damage. At this moment, no insurance company offers standard compensation of flood damage." M. Kok et al., *supra* note 3, at 149. In January 1953, spring tides and a heavy storm combined to flood Zeeland, a province in the south western part of the Netherlands. Almost 2,000 people were killed, 70,000 people were forced to evacuate and over 4,000 homes were destroyed. Coupled with rebuilding efforts after five years of German occupation, the flood deeply affected the psyche of the Dutch population, mobilizing political activity. The general national sentiment after the flood was that such a disaster should never reoccur, which exposed "predisaster cracks in the social system" and catalyzed innovative restoration. Uriel Rosenthal, *Disaster Management in the Netherlands: Planning for Real Events*, *in* MANAGING DISASTER: STRATEGY AND POL'Y PERSP. 274, 276-78 (Louise K. Comfort ed. 1988).

private insurance even less viable.[113] However, in 1998, the Dutch government passed the Calamities and Compensation Act (WTS), which provides *ad hoc* compensation for a flood when it "results in considerable disruption of public safety and requires a coordinated effort of organization and civil services."[114]

II. Extensive and impressive flood defense

In an attempt to prevent repeat flood losses and mitigate against the most rare flood risk, the Dutch government mobilized after the North Sea Flood to design and install flood coastal defenses "to withstand floods with an exceedance probability of 1/4000 up to 1/10,000 per year. The target probability of failure for river dikes is between 1/1250 and 1/2000 per year and measures are being implemented to reach this goal for inadequate dike sections."[115] Impressively, the Dutch government has undertaken the task of engineering an extensive dike system to withstand flood impact of overwhelming force. In contrast, NFIP concentrates its efforts to mitigate the base line flood that has a 1/100 chance of occurrence per year.

However, the Dutch flood policy creates ambiguities as to the consequences of potential government failure to maintain the dikes.[116] Also, there is no legislation that entitles individuals to flood compensation if the dikes fail or in the event that the 1/10,000 year flood event occurs.[117]

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[113] *See* Botzen, *supra* note 92, at 414.
[114] *Id.* at 416.
[115] M. Kok et al., *supra* note 3, at 148.
[116] *See id.* at 153.
[117] *See id.*

J. RECOMMENDATIONS FOR THE NATIONAL FLOOD INSURANCE PROGRAM INFORMED BY FLOOD INSURANCE PROGRAMS IN THE UNITED KINGDOM, FRANCE, GERMANY, AND THE NETHERLANDS

Under the Gentleman's Agreement, insurance companies in the UK bear the burden of flood risk because 1) flood insurance is mandatory, 2) despite differentiation in premiums, individuals are not incentivized to reduce flood risk, and 3) the government has not undertaken explicit duties to maintain flood defenses (at pace with the challenges of rising sea levels and increasing storms)[118] or compensate when flood losses overwhelm the insurance industry. Mandatory but flat flood insurance premiums in France, coupled with the government's insurance of last resort, insulate and reduce awareness of flood risks for both insurance companies and individuals, resulting in moral hazard. In Germany, market penetration for flood insurance is so low that the government assumes most flood risk and addresses this responsibility through *ad hoc* compensation. The Dutch government also assumes almost all flood risk by building extensive flood defense systems; however, the lack of a flood insurance program or government assumption of compensation for flood loss when the defense systems fail or are inadequate is troubling.

Compared to these flood insurance programs in the UK, France, Germany and the Netherlands, NFIP most actively strives to achieve a burden sharing of flood risks between individuals, insurance companies, and the government. Recommendations to improve flood risk management in Europe even support the policy model used by NFIP, stressing that: "[a] burden-sharing mechanism should be established that targets investment in mitigation schemes launched by governments, with support from the CEC[119] to assist people living on the floodplain (e.g. if the household complies with such schemes and invests in flood-

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[118] Osborne, *supra* note 91.

[119] Commission of the European Community, also known as the European Commission.

proofing initiatives, then their insurance premiums should decrease)."[120] However, various European flood insurance programs explored in this paper offer examples of policies which could improve NFIP.

I. Mandatory flood insurance

Insurance premiums should correspond to levels of flood risk, and will be negligible for those living in high elevation areas. The first recommendation for NFIP is requiring all property owners to carry flood insurance. Poor market penetration of flood insurance in Germany and the lack of flood insurance in the Netherlands place individuals in a precarious situation, where it is uncertain if and how much they might be compensated for flood losses. At the same time, the lack of a compensation guarantee in the event of flood losses can stimulate retreat from areas that are known to have high flood risks.

In the US, NFIP's delineation of flood zones in its FBHMs and FIRMs may similarly raise awareness of flood risks and stimulate retreat. However, the danger of these flood maps is that they may give a false sense of security to individuals located outside SFHAs, who might assume they are protected from risk and do not need to buy flood insurance or engage in flood mitigation.

Or, these maps could create a sense of flood expectancy for individuals in SFHAs, who might assume that their compliance with NFIP land use standards, such as raising their basements or reinforcing their foundations, sufficiently prevents flood loss. Mandatory flood insurance in the UK and France avoids adverse selection and gaps in insurance coverage when floods occur outside of high flood risk zones. Buildings in SHFAs that are not grandfathered-in are required to follow higher standards of land use and control compared to property outside of SFHAs. However, this may diminish the advantages of requiring

[120] A.L. Vetere Arellano, A. De Roo & J.P. Nordvik, *Reflections of the Challenges of EU Policy-Making with View to Flood Risk Management*, *in* FLOOD RISK MGMT IN EUROPE 433, 465 (Selina Begum et al. eds., 2007).

mandatory flood insurance because the availability of flood insurance outside of SFHAs may reduce awareness and incorporation of flood loss prevention and mitigation when there is a guarantee that flood loss claims will be paid. To address this moral hazard, NFIP should continue to tie insurance to land use regulation and require minimum land use management requirements in all zones. This would likely reduce flood loss and the need for *ad hoc* governmental compensation. Also, NFIP should offer discounts when property owners implement higher standards of land use management than what is required. NFIP itself should strive towards the No Adverse Impact (NAI) model of floodplain management, in which "the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation."[121]

II. Premiums that reflect flood risk

By spreading flood insurance premiums over a population that faces varying levels of flood risk, mandatory flood insurance supports the second recommendation for NFIP: attainment of actuarial balance. Actuarial balancing is important because it guarantees the sustainability of flood insurance by securing a funding source for the payout of claims, which reduces the burden on taxpayers once flood losses occur and the lag time between flood loss and redevelopment.[122]

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[121] Association of State Floodplain Managers, *No Adverse Impact* 2 (2008), *available at* http://www.floods.org/NoAdverseImpact/NAI_White_Paper.pdf. Additionally, the "No adverse impact philosophy can shape the default management criteria: a community develops and adopts a comprehensive plan to manage development that identifies acceptable levels of impact, appropriate measures to mitigate those adverse impacts and a plan for implementation. No Adverse Impact can be extended to entire watersheds as a means to promote the use of retention/detention or other techniques to mitigate increased runoff from urban areas." *Id.*

[122] *See generally* Jack Milligan, *Under Water: The Federal Program to Insure Property Owners Against Catastrophic Flood Losses is Badly in Need of a Fix*, MORTGAGE BANKING, Feb. 1, 2007, at 66.

NFIP can attain actuarial balance through mortgage or public utilities availability conditional on flood insurance in and outside of SFHAs (assuming that NFIP follows the first recommendation and requires mandatory insurance). In cases where mortgages or utilities cannot be conditioned on flood insurance because it is impractical or against public policy, NFIP should enforce a property tax equivalent to the flood insurance premiums on these properties.

Additionally, flood insurance in the US should be bundled with other risks, as it is in the UK, France, and Germany.[123] Pooling many risks, such as different types of disasters, reduces the threat of depleting or over-extending funds to pay out claims because it is less likely that a deluge of claims will arise out of a single catastrophic event. And in situations where one event (such as a hurricane) gives rise to many claims due to a combination of various perils (wind and flood), multi-peril insurance can deter evasion of paying out claims because there is no need to distinguish between the sources of damages (whether wind or flood) if the perils are covered in the policy.[124]

Also, in an effort to attain actuarial balance, NFIP needs to phase out subsidies. Where flood insurance exists in the European programs explored above, there is no evidence of governmental subsidies. By charging premiums more closely related to flood risk levels, individuals are likely to gain greater

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[123] Botzen, *supra* note 92, at 422-23; *see also* M. Kok et al., *supra* note 3, at 147-48.

[124] *See Multi Peril Insurance Act of 2007: Hearing on H.R. 920 Before the Subcomm. of the H. Fin. Serv. Comm.*, 110th Cong. (2007) (statement of Rep. Charlie Melancon) ("By bundling wind and water coverage into one plan, multi-peril insurance would cover home damaged by hurricanes, regardless of whether winds or flooding caused the damage. Not only will this provide homeowners with peace of mind, it will indirectly save them money because they will be able to avoid costly and time-consuming legal battles like those waged after Katrina and Rita, when many homeowners had to hire lawyers and engineers for independent assessments. A multi-peril insurance policy will also create more efficiency in adjusting claims, and homeowners will receive their payments much faster than under the current two-policy system.").

awareness of the severity of this risk and have lower incentives to live in high flood risk areas.

On the downside, charging full actuarial rates may excessively burden some property owners, such as those still recovering from Hurricanes Katrina and Rita.[125] For example, in some instances "flood-insurance premiums would go up so high that homeowners might decide not to rebuild their damaged or destroyed homes if they couldn't afford the premiums or the cost of elevating their homes above sea level, which would qualify them for lower premiums."[126] Higher premiums for owners of older properties could also potentially force individuals to become delinquent on their mortgages and increase the potential for foreclosure.[127] These negative social consequences arise because of unsustainable development in high risk flood zones without corresponding mitigation of flood risks. As difficult as it may be, phasing out subsidies is critical to achieving more rational behavior in response to flood risk, which is necessary to protect people and property from future losses.

K. CONCLUSION

Increasing sea levels and extreme storm events due to growing climate change exacerbate flood risks. Although humans cannot directly control heavy precipitation or extreme flood events, humans can learn to live with these events, and "behave in a manner to mitigate potential risks for people and [property]."[128]

Within the United States, mandatory flood insurance and compliance with minimum land use regulation will strengthen the existing NFIP. Also, protection of NFIP's finances by achieving actuarial balancing and passing costs to property owners will ensure sustainability of NFIP and encourage more rational

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[125] Milligan, *supra* note 122, at 66, 68-69.
[126] *Id.* at 69.
[127] *Id.*
[128] *See Best Practices on Flood Prevention, Protection and Mitigation*, *supra* note 1, at 29.

behavior informed by serious and growing flood risk. Greater awareness and preparedness for flooding events will help protect against unnecessary human and economic loss, as experienced with Hurricane Katrina.[129]

Although beyond the scope of this paper, in addition to strengthening NFIP, the U.S. government needs more comprehensive[130] and better maintained flood defenses, especially when juxtaposed with Netherlands' extensive flood defense system which, at the minimum, is able to withstand floods that have a probability of occurrence of 1/2,000 per year.[131] Investment in flood defenses also reduces the need for *ad hoc* governmental assistance after a flood disaster, which can be more expensive than the flood defenses themselves. An integrated approach to flood disaster prevention and mitigation spreads the burden of flood risk among property owners and the government, which depend on each other's rational decision-making to stay above the water.

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[129] *See* Michael D. Adler, *Policy Analysis for Natural Hazards: Some Cautionary Lessons from Environmental Policy*, 56 DUKE L. J. 1, 4 (2006).

[130] Especially natural flood defenses, such as marshes, sand banks and mangrove swamps. *See* Sami Grover, *The Tide is Turning: Natural Flood Defence Makes a Come-back*, TREEHUGGER, July 9, 2006, http://www.treehugger.com/files/2006/07/flood_defense.php.

[131] *See* M. Kok et al., *supra* note 3, at 148.