

Resilient Infrastructure Swap Exchange (RISE)

Building Resilience to Climate Change

The Challenge

Developing countries are uniquely vulnerable to extreme weather events, the intensity and frequency of which are exacerbated by climate change. From 2003 to 2013, natural disasters caused \$550 billion of damages in developing countries, where resources, financing, and expertise to prevent and respond to these events remains extremely limited. (1) Vietnam is one of the top 10 countries in the world that has been affected by climate change in the last two decades (2). Extreme weather events have resulted in more than 13,000 deaths and \$6.4 billion in property damages. (3) The Mekong Delta region and nearby Ho Chi Minh City are especially vulnerable because of vast expanses of low-lying coastal areas – yet these two regions power significant economic growth. The Mekong Delta is critical to the country's agricultural production and exports and is home to 18 million people (4). Furthermore, Ho Chi Minh City is home to 6.3 million people and accounts for 23% of GDP and 20% of FDI in Vietnam, but it is one of the top ten 10 cities in the world most likely to be "severely affected by climate change," as it stands barely above sea level. (5)

Why Vietnam?

90% of population affected by typhoons and resulting inland flood damages (6)

1 of 10 countries most affected by climate change in last two decades (2)

1.5% % of GDP lost annually due to natural disasters (3)



The Solution

The Vietnam RISE Swap is an insurance-linked security (ILS) that is analogous to a credit default swap for a standard catastrophe bond. Similar to a catastrophe bond, RISE is underwritten by a financial institution and actuarially assessed by a professional catastrophe modelling firm. However, RISE provides a more liquid market than a standard insurance contract by creating a secondary trading market. This mechanism enables investors to increase or decrease their hedged exposure based on their enterprise risk management needs.

RISE features a parametric trigger that activates when modeled typhoon property damages within the specified geographic area exceed the attachment point of the tranche. Non-correlated with market returns, RISE allows investors to tailor their weather exposure and hedging strategies effectively, all the while generating positive social impact. If the attachment point is reached, a portion of the proceeds flowing to the investor holding the long position are used to fund resilient impact projects. If the attachment point is not reached, a smaller portion is paid by the investor holding the short position. By treating instances of infrastructure mobility brought on by named storm damages as moments of opportunity for rebuilding and growth, RISE mobilizes investments in resilient infrastructure when they matter most.

Investment Profile Details			
Asset	Insurance-Linked Swap	Expected Long IRR (5-year)	Tranche A: 30% Tranche B: 10% Tranche C: 2%
Investment Vehicle	Over the Counter Swap Market	Expected Short IRR (5-year)	Tranche A: 41% Tranche B: 41% Tranche C: 41%
Market Time Horizon	5 years	Fees	5% origination 1.5% annual
Fund Size	\$100 million	Minimum Investment	\$10,000
Attachment Point	Tranche A: \$2.5 billion modeled damages Tranche B: \$2.0 billion modeled damages Tranche C: \$1.5 billion modeled damages		

Market Value Proposition

Competitive returns, liquidity, and guaranteed flow of funds to verified impact

✗ Short Position

✓ Long Position

Target Segments

- Hedge funds
- Family foundations
- Insurance companies*

- Local municipalities or companies
- Large multinationals with local exposure
- Insurance companies*


Key Benefits

Portfolio diversification uncorrelated to market with reliable support for affected populations

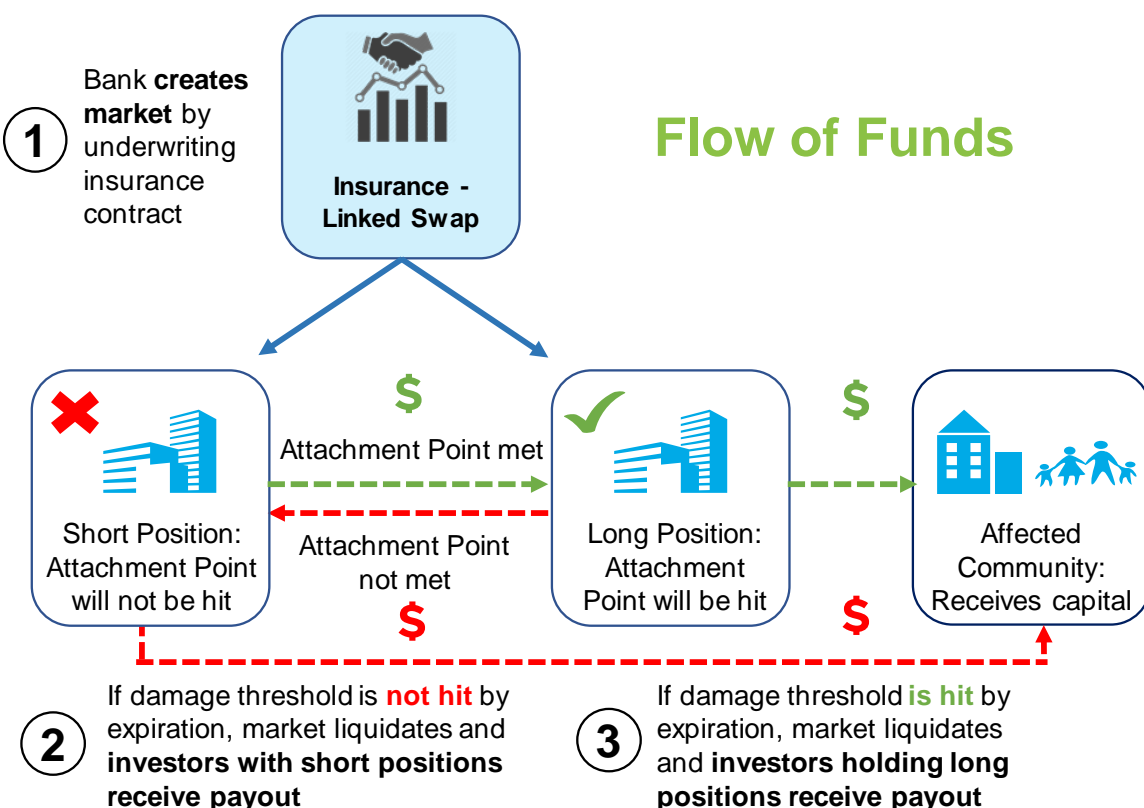
Affordable, flexible, and scalable protection against climate-related damages

Illustrative Investor

The Gates Foundation  funded \$30.7M in disaster relief in 2015, demonstrating growing interest from family foundations (7). A RISE short is a win-win for foundations; even a loss of principal results in significant impact flows.

Intel's Vietnam subsidiary has a \$1B manufacturing facility in Ho Chi Min City that makes 80% of the world's semiconductor chips (8, 9) 

*Insurance companies would be the most active traders taking either side to cover exposure



Sources: (1) Climate Finance Lab, 2017; (2) German Watch, Global Climate Risk Index, 2017; (3) The World Bank Vietnam - Emergency Flood Disaster Reconstruction Project, 2017; (4) Climate Home News, 2018; (5) Asian Development Bank Ho Chi Minh City Adaption to Climate Change Report, 2010; (6) The World Bank Vietnam Initial Market Assessment; (7) Philanthropy News Digest, 2017; (8) Computer World, 2010; (9) Tuoi Tre News, 2014; (10) Green Climate Fund/UNDP Funding Proposal, 2016; (11) CIA World Fact Book: Coastline, 2017; (12) World Bank Press Release, 2016

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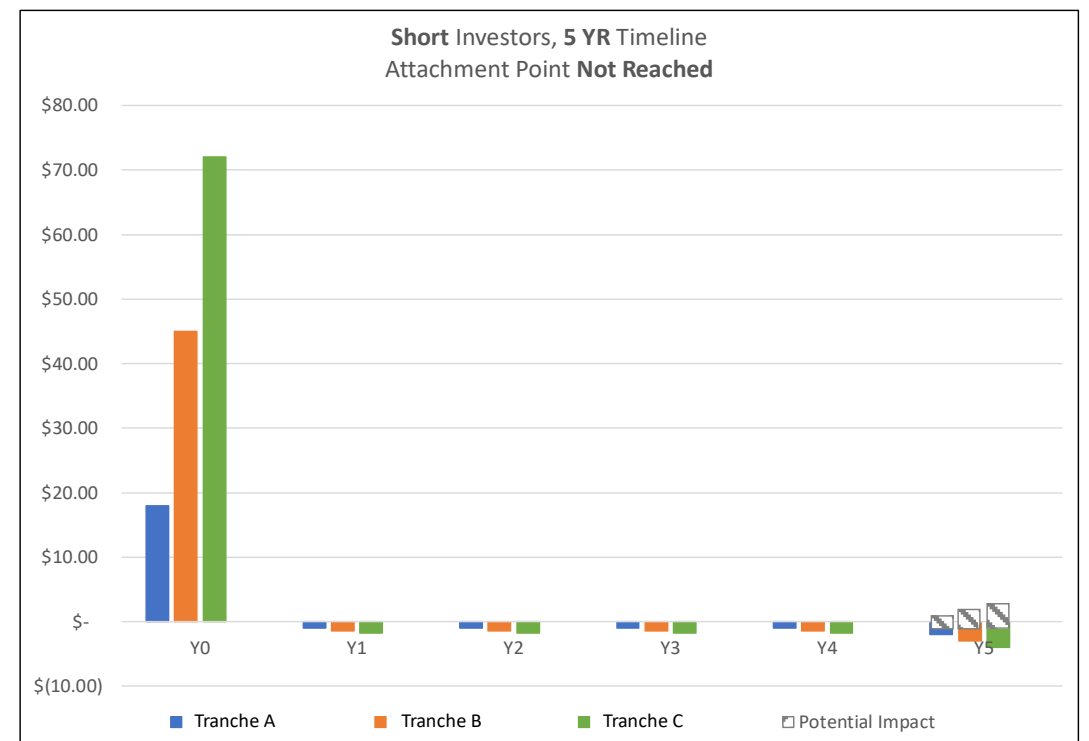
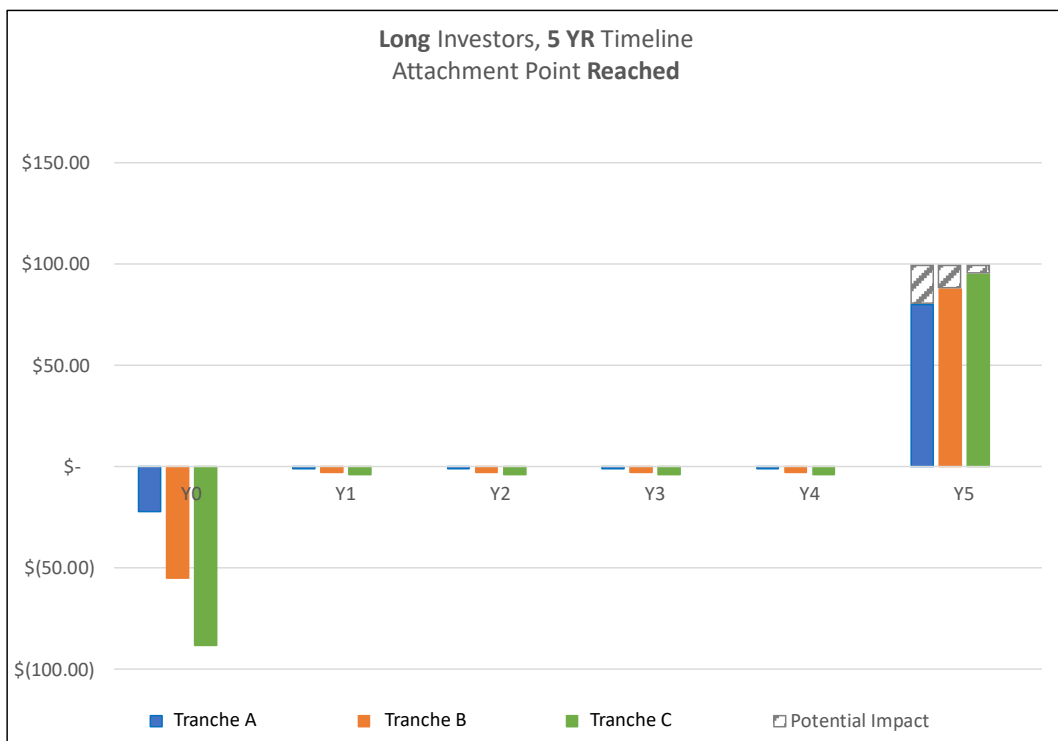
Cash Flow Scenarios

RISE provides competitive returns for both long and short investors while also providing guaranteed capital to help Vietnamese populations exposed to the negative effects of climate change.

The two graphs show upside cash flows to both long and short investors while also highlighting the funds flowing to impact projects (assuming investor buys on effective date and holds through maturity).

The timeline sensitivity analysis shows IRR projections for Tranche A if the attachment point is reached before the expiration date.

IRR Timeline Sensitivity Analysis			
Investor	Year	IRR	Impact \$
Long Investor	1	280%	\$20
Attachment Point Reached	3	55%	Assuming \$20 initial price
	5	30%	
Short Investor			\$1
Attachment Point Not Reached	5	41%	Assuming \$20 initial price



Impact

When RISE pays out, a portion of investor profits automatically flow to coastal resilience projects aimed at reducing future typhoon damage. Both local organizations and international development agencies/NGOs are actively seeking to implement a variety of shovel-ready projects, from the incorporation of storm-resistant building features to the planting of mangrove trees along coastlines. Though some progress has been made, true scale has not been achieved due to inconsistency of donor and grant funding, as well as overall lack of capital investment. For example, redevelopment of 1,000 hectares of mangroves costs, on average, \$3 million, and is sufficient to reduce storm surge by as much as half a meter along a ten kilometer stretch of coastline. (10) The initial RISE market will be able to raise as much as \$37.5M in impact funding over five years, enough to finance the protection of 125 km of vulnerable coastline. If successful, this model is replicable throughout Vietnam (3,444 km of total coastline) and scalable across Southeast Asia (Indonesia has 54,720 km of coastline; the Philippines has 36,289 km). (11) Similar resilience projects may include efforts to protect key agricultural sectors (e.g. rice production and exports) or to stabilize major roads and transport networks in and around Ho Chi Minh City.

Illustrative Projects



The World Bank is funding a \$310 million project to build climate resilience and ensure sustainable livelihoods of 1.2 million people living in nine Mekong Delta provinces affected by climate change, salinity intrusion, coastal erosion, and flooding. (12)



The UNDP, Green Climate Fund, and Government of Vietnam are partnering to regenerate 4,000 hectares of coastal mangrove storm surge buffer zones, testing at scale this natural coastal resilience strategy.

**Overall Objective:
Sustain Economic
Livelihoods**

Illustrative Metrics

**Change in Rice Production
Output & Exports**

**Number of People
Unemployed**

**Business Continuity (e.g.
number of days without
power)**

**% of Major Road Mileage
Functioning**

Risk Factors

	Risk	Description	Mitigation
Impact	Project Pipeline	Uncertainty of ultimate financing amount and timing may make this unsuitable for some types of projects and impact partners.	Choose projects that are most likely that will present temporal matches to timing of disaster damage. Choose large, stable impact partners for whom these cash flows are not mission critical.
	Currency Risk	Local impact entities exposed to USD currency risk	Encourage impact partners to develop hedging strategy

	Risk	Description	Mitigation
Investment	Liquidity Risk	Product may not attract sufficient number of investors to create a truly liquid trading market, discouraging investors for investing in similar vehicles in the future.	\$10,000 minimum investment should attract investors of varying sizes, enticing a larger number of investors into the market
	Trigger Type	Low penetration of insurance in Vietnam means using insured losses as the attachment point trigger is volatile and unreliable.	Parametric trigger based on a pre-agreed model and asset exposure database, allowing for both ease of analysis and objectivity of when trigger has been activated.