



# Global Agricultural Insurance for All (GAIA)

Using parametric insurance to tap previously unreachable markets and protect some of the world's most vulnerable farmers from the impacts of Climate Change

## Fund Profile

- **Fund Size:** USD \$25 million
- **Geography:** Thailand
- **Asset Class:** Private Equity
- **Investors:** Small to medium-sized impact investors
- **Target IRR:** 13-20%
- **Time Horizon:** 10 years
- **Fees & Incentives:** 5% equity, 1% sales

## Geography

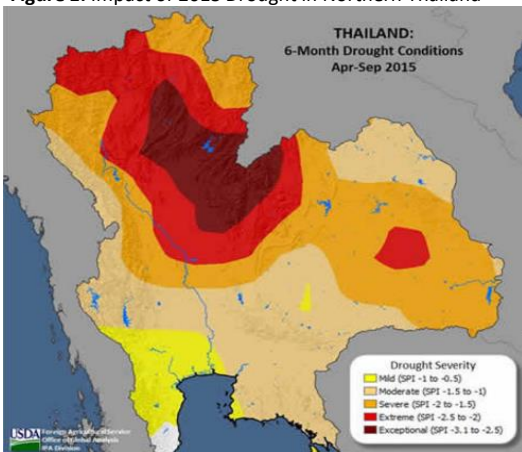


- Thailand has about 10.5 million hectares of arable land, producing ~30 million tons of rice per year.<sup>2</sup>
- 80% of the country's rice production relies on rain-fed irrigation.<sup>2</sup>

## Market Size

- **Size:** Approximately 3.2 million rain-fed rice farms in Thailand on which 10 million farmers work.<sup>2</sup>
- **Value:** If 50% of the harvest value of these farms were insured, estimated rice insurance market of \$800M.

Figure 1: Impact of 2015 Drought in Northern Thailand<sup>2</sup>



## THE CHALLENGE

Agricultural production is a critical source of sustenance and economic income for the rural farming population in the developing world. However, many of these farmers are extremely susceptible to climate shocks, such as droughts, which are expected to become more frequent as a result of climate change. When droughts occur, farmers often lose their entire seasonal crop yield, sending them into debt and poverty.

In 2015, Thailand was the world's second largest exporter of rice with 80% of its rice production dependent on rainfall during the monsoon season of July - September.<sup>1</sup> According to the USDA Foreign Agricultural Service, Thailand is currently experiencing a second consecutive year of below-normal rainfall, which has caused 2016 rice production to decline by about 9-12% year-on-year.<sup>2</sup> With two-thirds of annual rice production used for domestic consumption and another third exported to generate foreign reserves, the decline in rice production poses serious challenges to Thailand's agricultural sector and overall economy.

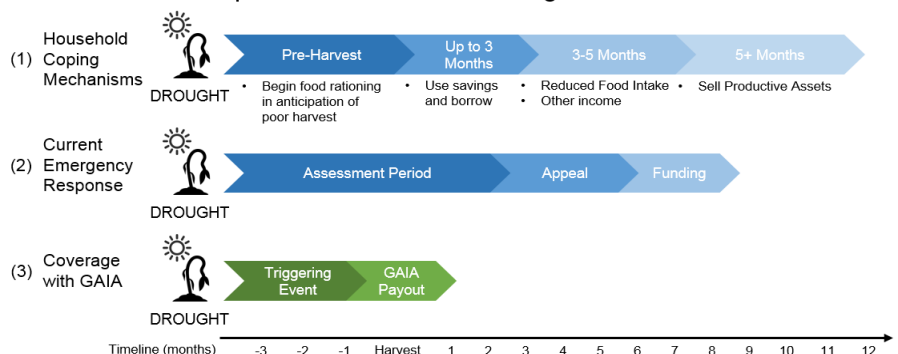
Farmers are especially vulnerable to the effects of climate shocks.<sup>3</sup> While some farmers may have access to post-disaster financial relief, aid often comes too late and covers too little. Furthermore, while safety nets like agricultural insurance exist for developed economies in the international market, individual farmers in Thailand have very limited access to this type of coverage, as it is too expensive to scale traditional insurance coverage to small-scale farms.<sup>4</sup>

## THE SOLUTION

Weather Index-based Insurance (WII) is a new and innovative financial instrument that successfully supports disaster risk management in developing countries. Index-based agricultural insurance has proven success in many countries, including India and member countries of the African Risk Capacity.<sup>5</sup> WII's parametric system differs from traditional insurance because payouts are made based on the occurrence of a pre-determined triggering event such as rainfall and extreme temperature. During droughts, the parameter index applied is designed to closely correlate with crop losses. The advantage of WII is that it eliminates the dual problems of adverse selection and moral hazard that afflict traditional insurance. Additionally, WII allows for lower operating and transaction costs because claims and losses do not require first-hand validation via the claims adjustment process; instead, they are automatically paid out when pre-specified parameters are triggered. Payments can be made immediately via a distributed payout system with mobile alerts, thus minimizing the processing time. Overall, WII is effective at providing immediate financial relief because it:

- **Allows for quick disbursement of critically needed funds:** When droughts occur, farmers often have very limited time to find ways to protect their crops, or find alternative sources of income in order to avoid falling into a downward spiral of economic losses. When insured, however, farmers can quickly access necessary liquidity and secure their livelihoods.
- **Offers affordable premiums that accurately cover losses:** WII utilizes historical rainfall, climate modelling, agronomic data to set weather-indexed triggering events that are highly correlated with crop loss. Premiums under WII are affordable due to lower claim processing expenses relative to those under traditional insurance.
- **Enhances farmer resilience and macroeconomic stability by increasing their drought-preparedness:** By providing insurance coverage and frequent climate updates, the WII model can help farmers to be better prepared and understand their risks and exposure, while also stabilizing the overall national economy.

## Response Timeline from Drought for Farmers



[1] Tawee Kupkanchanakul, Bridging the Rice Yield Gap in Thailand, Rice Research Institute, Department of Agriculture, (2000) <http://www.fao.org/docrep/003/x6905e/x6905e0d.htm>

[2] United States Department of Agriculture (USDA): Foreign Agricultural Service Commodity Intelligence Report, Thailand: Irrigation Shortage Reduces 2015/2016 Rice Production (October 28, 2015) <http://www.pecad.fas.usda.gov/highlights/2015/10/th/index.htm>

[3] Hallagete et al. Shock Waves: Managing the Impacts of Climate Change on Poverty, The World Bank Group (2016) <https://openknowledge.worldbank.org/bitstream/handle/10986/22787/9781464806735.pdf?sequence=13&isAllowed=y>

[4] W. Dick, and W. Wang. Governmental Interventions in Agricultural Insurance, International Conference on Agricultural Risk and Food Security (2010) <http://www.sciencedirect.com/science/article/pii/S221078431000033>

[5] Greatrex et al. Scaling up index insurance for smallholder farmers, CCAFS Report No.14 (2015) <https://cgspage.cgiar.org/rest/bitstreams/38715/retrieve>



## IMPLEMENTATION

**Investment Thesis:** GAIA seeks to provide global climate insurance coverage to farmers that are vulnerable to climate shocks by offering them Weather Indexed-based Insurance. GAIA will begin in Thailand targeting rice farmers susceptible to drought for the wet season harvest. After successful implementation of GAIA in Thailand, GAIA has identified Vietnam and the Philippines as attractive markets for further investment.

**Reinsurance:** A number of global reinsurance companies including Swiss Re, Allianz, Barclays, and Deutsche Bank have made public commitments to expand their holdings of climate risk insurance. GAIA will have a competitive bidding process in order to select its reinsurance partner over the life of the project. The vast majority of risk will be passed through to global reinsurance companies to minimize the volatility of GAIA's return on equity. GAIA will hire an actuarial consultant like Aon Hewitt to perform the insurance modeling.

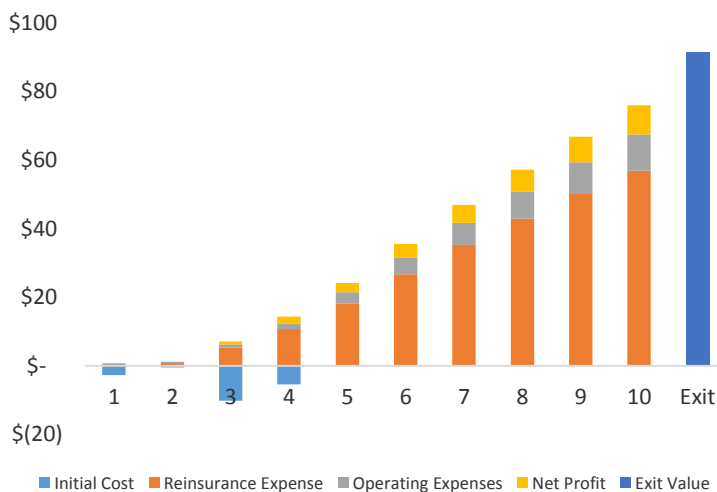
**Distribution Network:** GAIA will partner with the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand, which was established in 1966 and provides agricultural loans to farmers.<sup>6</sup> This partnership will be mutually beneficial because GAIA can reduce the default rate of BAAC's borrowers as WII reduces borrowers' income volatility. At the same time, GAIA will have access to BAAC's loan portfolio and will gain credibility with farmers.

In addition, GAIA will set up an extensive distribution network in northern Thailand that comprises partnerships with local convenience store chains, which will serve as premium payment and insurance payout points for farmers. Additionally, given the high penetration of mobile phones in Thailand, GAIA will establish mobile text notification services. Through these networks, GAIA will provide farmers with timely updates on weather conditions, share best practices on how to protect their crops, and allow farmers to manage payments and payouts. Ultimately, GAIA seeks to enhance the resilience of farmers by providing them with insurance coverage and increasing their capacity to deal with drought.

**Rice Farmers:** GAIA will reach rice farmers across northern Thailand by employing a local sales force and offering a 3% commission on insurance premiums. GAIA will train the sales force as to the benefits of insurance and will engage in community awareness outreach events across northern Thailand. As seen in **Figure 1** on page 1, there was a severe drought in northern Thailand in 2015 so farmers will understand the need for agricultural insurance. As GAIA expands to other regions of Thailand in the years to come, the team will conduct further outreach in other agricultural regions as well.

RISK	MITIGATION
Payout Volatility	Reinsurance providers bear risk of payout volatility
Currency Risk	Currency hedging for USD-denominated investment
Underpricing the actuarial probability of payout	Reinsurance providers bear risk of underpricing
Collectability of premiums	All insurance contracts are prepaid
Low farmer adoption rates	Local sales force and farmer memory of 2015 drought
Operating Environment Risk	Thailand is ranked in the top quartile by the World Bank in its Ease of Doing Business

## CASH FLOW PROJECTIONS (US\$ MILLIONS)

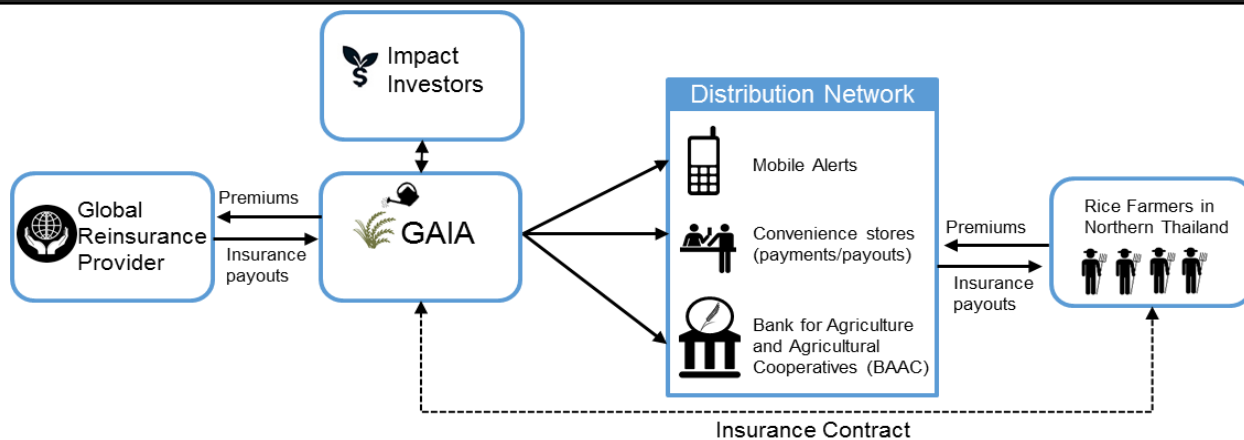


- Proving the Model (Years 1 & 2): \$5M funding
- Full-Implementation Rollout (Years 3 – 10): \$20M funding
- Initial Cost to include insurance contract design, distribution network contracts and infrastructure, reinsurance bidding, and local sales force recruitment and training.
- Market penetration growing from 0.2% in Year 1 to 10% of Thai rice farms in Year 10, a total of 300,000 farms, or 1.1 million farmers.
- Operating Expenses forecasted at 11% of premiums revenue.
- Premiums to be received from farmers estimated at 15% of the insured harvest value. Reinsurance premiums estimated at 12% of insured harvest value.
- Assumed that farmers on average will insure 50% of their total harvest value.
- 8% terminal growth rate
- 3% sales commission included in operating expenses.

Impact	Econ	Social	Environ
Reduce annual income volatility for rice farmers	📈	👤	
Early warning food shortage detection		👤	
Greater income security for farmers	📈	👤	
Reduce farmers' incentive to exploit environmental resources in drought years			🌳
Improve farmer awareness of financial services	📈	👤	
Reduce volatility of overall Thai economy	📈		🌳

**Social Impact Metric:** By Year 10, over 1.1 million farmers will be protected by GAIA

## FUND DIAGRAM



[6] Bank for Agriculture and Agricultural Cooperatives (BAAC): [http://www.baac.or.th/baac\\_en/index.php](http://www.baac.or.th/baac_en/index.php)