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3rd Asia Agriculture Insurance Conference

20-21 September 2016, Mandarin Orchard Hotel, Singapore

Theme: "Proactive Strategies to Meet Market Needs for Cover"



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3rd Asia Agriculture Insurance Conference

20-21 September 2016, Mandarin Orchard Hotel, Singapore

Agriculture is booming in Asia, climate change and weather notwithstanding. Research and innovation in agriculture is rapidly rising. Today, farming has taken on new forms with higher crop values, innovative products, cost-effective business models, new distribution channels and advanced technologies.

Hence, the agriculture sector is looking to insurers for help to manage the risks and challenges as climate change, rainfall patterns shift and extreme weather conditions like severe heat, drought and floods continue to threaten cultivation and cattle for both small-scale farmers as well as commercial farming enterprises. Can the insurance industry rise to meet the increasing demands for agriculture cover and translate such market potential to real growth? And how? Can the industry respond to the needs of the farmers? Many global players are also eyeing this sector of the pie. And this is being a game changer.

The 3rd Asia Agriculture Insurance Conference organized by Asia Insurance Review will take the debate a step further to look at the changing risk landscape of the farming communities in Asia and a clear role for the insurance sector to provide the right

strategies to boost the agriculture sector's resilience. The 2-day Conference will also examine trends and developments around the region and the world, product development, underwriting dynamics and the success factors for sustainable agriculture insurance.

This Conference is a MUST ATTEND for agriculture underwriters, reinsurers, brokers, government agencies, regulators, consultants, as well as service providers keen to tap the potential of the agriculture insurance market.

Register Now

Who Should Attend

- Government Agencies Responsible for Agriculture Insurance
- Regulators
- Insurers, Reinsurers and Brokers Engaged in the Business of Agriculture Insurance
- NGOs
- Banks and Leasing Companies Involved in Agriculture Finance
- Management Consultants
- Service Providers Keen to Tap the Potential of the Agriculture Insurance Market

Speakers include:



Dr Antonis Malagardis
Program Director, Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia (RFPI Asia), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Philippines



Prof Shie-Yui Liong
Deputy Director, Tropical Marine Science Institute, National University of Singapore



Peter Book
Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore



Heath Amber
Managing Director, Millennium Underwriting Agencies Pty Ltd, Australia



Jeffrey Khoo
Vice President & Senior Originator Global Food and Agriculture, Swiss Re Corporate Solutions, Singapore



Salah Dhouib
Class Underwriter – Agriculture, Liberty Specialty Markets, France



Alex Chen
Founder and CEO, Asia Risk Transfer Solutions, Singapore



Michael Schwarz
Managing Director, Asiability Group, Hong Kong



Himanshu Garg
Actuary, Marsh India Insurance Brokers Private Limited



Ian Shynkarenko
CEO & Co-Founder, AgrolInsurance International LLC, Ukraine/Georgia



Ayandev Saha
General Manager, KM Dastur Reinsurance Brokers, India



Andrea Shi
Vice President, Agricultural, The Toa Reinsurance Company of America, USA



Mark Rueegg
CEO, CelsiusPro, Switzerland



Andrés Lorenzana
Principal Officer, MAPFRE RE Singapore Branch & Labuan Branch



Hang Gao
Vice President, Guy Carpenter, China



Stephen Stout
Executive Chairman and CEO, AgRisk Limited, Singapore



Wen Chen
Sales Director—Asia, AgRisk Limited, Singapore



Dr Mohan Sharma
Risk Consultant, AgRisk Limited, Singapore



Teddy Hailamsah
Senior Advisor to Secretary General, ASEAN Insurance Council; & President Director, PT Asuransi Central Asia, Indonesia



Jovian Ang
Vice President, Business Development, Asia Risk Transfer Solutions, Singapore



Rachael Wallington
Senior Underwriter, International Reinsurance, MS Amlin Asia Pacific, Singapore



Trinita Situmeang
Associate Director - General Reinsurance, PT Marein Tbk, Indonesia



Sonu Agrawal
Managing Director, Weather Risk Management Services, India

3rd Asia Agriculture Insurance Conference

20-21 September 2016, Mandarin Orchard Hotel, Singapore

PROGRAMME

Day One: 20 September 2016, Tuesday

8.00 am	Registration & Coffee
9.00 am	Welcome Address by Conference Chairman <i>Stephen Stout, Executive Chairman and CEO, AgRisk Limited, Singapore</i>
9.10 am	Implementing the Micro-Agri Regulatory Framework in the Philippines <i>Dr Antonis Malagardis, Program Director, Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia (RFPI Asia), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Philippines</i>
9.40 am	Impacts of Climate Change on Mekong River Delta's Rice Crop Yields <i>Prof Shie-Yui Liong, Deputy Director, Tropical Marine Science Institute, National University of Singapore</i>
10.10 am	Key Factors for Sustainable Agriculture Insurance Systems <i>Peter Book, Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore</i>
10.40 am	Q&A
10.50 am	Tea Break Hosted by Weather Risk Management Services

Agriculture Insurance Today - Opportunities and Challenges

11.15 am	Risk Management Solutions for Agriculture Corporates in the Food and Agriculture Chain <i>Jeffrey Khoo, Vice President & Senior Originator Global Food and Agriculture, Swiss Re Corporate Solutions, Singapore</i>
11.40 am	Big Data and Sustainable Insurance for Agriculture <i>Hang Gao, Vice President, Guy Carpenter, China</i>
12.10 pm	Dynamics of Developing a Weather Index Product: Feasibility, Scalability and Sustainability <i>Salah Dhouib, Class Underwriter - Agriculture, Liberty Specialty Markets, France</i>
12.35 pm	Q&A
12.45 pm	Lunch

Agriculture Insurance Markets in the Region

2.00 pm	This session will look at trends and developments of agriculture insurance in various markets with a view to draw strategic tips and lessons An Overview of China Agriculture Insurance <i>Wen Chen, Sales Director - Asia, AgRisk Limited, Singapore</i> Development of Agriculture Insurance in Australia <i>Heath Amber, Managing Director, Millennium Underwriting Agencies Pty Ltd, Australia</i> Indonesian Agricultural Insurance - Opportunities and Challenges <i>Trinita Situmeang, Associate Director - General Reinsurance, PT Marein Tbk, Indonesia</i> Indian Crop Insurance: Opportunities and Challenges for Reinsurers <i>Himanshu Garg, Actuary, Marsh India Insurance Brokers Private Limited</i>
3.00 pm	Q&A

Panel: Agriculture Risk Modelling

3.10 pm	This panel will look at the changing risk landscape of the farming community in Asia and how risk modelling can boost the agriculture sector's resilience: - How Agriculture Risk Modelling Has Evolved to Meet Needs of the Rapidly Changing Risk Environment - Challenges of Modelling Agriculture Risks in Emerging Markets - Case Studies on Innovative Risks Modelling Moderator: <i>Sonu Agrawal, Managing Director, Weather Risk Management Services, India</i> Panellists include: • <i>Salah Dhouib, Class Underwriter - Agriculture, Liberty Specialty Markets, France</i> • <i>Prof Shie-Yui Liong, Deputy Director, Tropical Marine Science Institute, National University of Singapore</i> • <i>Rachael Wallington, Senior Underwriter, International Reinsurance, MS Amlin Asia Pacific, Singapore</i> • <i>Andrea Shi, Vice President, Agricultural, The Toa Reinsurance Company of America, USA</i> • <i>Dr Mohan Sharma, Risk Consultant, AgRisk Limited, Singapore</i>
4.00 pm	Tea Break and End of Day One

Day Two: 21 September 2016, Wednesday

New Business Trends

9.00 am	Agriculture Risk Management and Insurance: A Reinsurer's View <i>Liu Xiaoliang, Underwriter, Agricultural Risks, Hannover Re, Germany</i>
9.30 am	Special Case Study on Innovative Risk Modelling - California Specialty Crops <i>Andrea Shi, Vice President, Agricultural, The Toa Reinsurance Company of America, USA</i>
10.00 am	Agriculture Insurance for the Masses - Livelihood Insurance for the Farmers <i>Alex Chen, Founder and CEO; & Jovian Ang, Vice President, Business Development, Asia Risk Transfer Solutions, Singapore</i>
10.30 am	Q&A
10.40 am	Tea Break
11.00 am	Managing Agricultural Claims/Loss Handling - Assessment Methods and New Techniques <i>Ian Shynkarenko, CEO & Co-Founder, AgroInsurance International LLC, Ukraine/Georgia</i>
11.30 am	Agriculture Micro Insurance - A Missing Puzzle in Developing Indonesia's Sustainable Agriculture <i>Teddy Hailamsah, Senior Advisor to Secretary General, ASEAN Insurance Council; & President Director, PT Asuransi Central Asia, Indonesia</i>
12.00 pm	Challenges in Agriculture Insurance in Asia and How to Overcome Them <i>Shailendra Supra, Associate Director, Global ReSpecialty, APAC, Aon Benfield Asia, Singapore</i>
12.30 pm	Q&A
12.40 pm	Lunch
2.00 pm	Panel: Multi-stakeholder dialogue between the insurance industry and government agencies on catastrophe risk protection and microinsurance for rural communities - Catastrophe Risk and Agriculture: Different Catastrophe Events and Impact on Portfolios - Future Outlook on Catastrophe Risks - The Value Proposition of Microinsurance Linked to the Agricultural Value Chain - Challenges: Building Trust and Financial Literacy, Efficient Distribution and Administration, Data, New Products - Case Studies of Innovative Agriculture Microinsurance Project Set-Ups Moderator: <i>Teddy Hailamsah, Senior Advisor to Secretary General, ASEAN Insurance Council; & President Director, PT Asuransi Central Asia, Indonesia</i> Panellists include: • <i>Ayandeve Saha, General Manager, KM Dastur Reinsurance Brokers, India</i> • <i>Michael Schwarz, Managing Director, Asiability Group, Hong Kong</i> • <i>Dr Kiyonoush Ghalavand, Superior International Adviser in Agricultural Economics (Natural Disaster, Risks and Insurance)</i>

Special Focus - Impact of Technology in Agriculture Insurance

2.45 pm	Panellists will discuss: - Innovations in Agriculture Technology - Challenges and Opportunities for (Re)insurers - Satellite/Remote Sensing Technology: How This Mapping Technology Has Changed the Agriculture Insurance Landscape & Latest Development - How Can Success Stories in Europe Be Adopted in Asia Moderator: <i>Peter Book, Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore</i> Panellists include: • <i>Mark Rueegg, CEO, CelsiusPro, Switzerland</i> • <i>Andrés Lorenzana, Principal Officer, MAPFRE RE Singapore Branch & Labuan Branch</i>
3.30 pm	Tea Break & End of Conference

3rd Asia Agriculture Insurance Conference

20-21 September 2016 • Mandarin Orchard Hotel, Singapore

Registration Email: weeling@asiainsurancereview.com

Conference Registration

Registered by _____

To: Ms Wee Ling, Asia Insurance Review
 69 Amoy Street, Singapore 069 888 • Tel: (65) 6224 5583
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PERSONAL PARTICULARS

Name: Mr/Mrs/Ms/Dr/Prof
 First Name: _____ Last Name/ Surname: _____
 Nationality _____
 Passport No _____
 Job Title _____
 Company _____
 Address _____

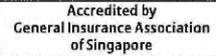
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REGISTRATION

Early Bird (valid till 23 August 2016)	Normal Registration
Subscribers <input type="checkbox"/> US\$1,280	Subscribers <input type="checkbox"/> US\$1,780
Non-Subscribers <input type="checkbox"/> US\$1,580*	Non-Subscribers <input type="checkbox"/> US\$1,980*

(*Free One Year Subscription to Print Edition of Asia Insurance Review & AIR e-Daily)
Full registration fees MUST be paid before the valid dates for admittance at conference.
 Only registrations FULLY PAID FOR by the early-bird deadline will be eligible for the discount.
 I came to know about this conference through:
 AIR/MEIR magazine AIR/MEIR Website Brochure Email
 Referral by (Association/ Sponsor/ Speaker/ Exhibitor/ Business Contact)

Group registration: Special Offer for Year 2016
 Register three delegates from the same company, and send the fourth delegate to attend the conference free of charge!
 (Valid only for delegates from the same company in the same country).
 Registration fee includes participation at Conference plus tea breaks and lunches.



All meals are prepared without pork, lard and beef.

Special Dietary Requirements
 I would like to have vegetarian meals during the Conference.

Closing date for registration: 13 September 2016

For cancellation in writing made before 23 August 2016, 50% of the conference fee will be refunded. No refunds will be made for cancellations after 23 August 2016. However, substitution or replacement of delegates will be allowed.

PAYMENT
 I undertake to indemnify the organisers for all bank charges

I enclose a cheque / bankdraft in US Dollars made payable to "ASIA INSURANCE REVIEW"

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Please debit the sum of US Dollars US\$ _____ for Conference Registration fee from my

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 Signature: _____ Date: _____

(Conference fee is inclusive of prevailing GST for Singapore incorporated business)

Hotel Reservations:
Email: charlotte.chew@meritushotels.com

Hotel Reservation Form

Attn: Ms Charlotte Chew,
 Assistant Director of Business Development
 Email: charlotte.chew@meritushotels.com
Mandarin Orchard Singapore, by Meritus
 333 Orchard Road, Singapore 238867
 Tel: (65) 6737 4411 • Fax: (65) 6738 2382
www.meritushotels.com

PLEASE FILL IN GUEST PARTICULARS ON REGISTRATION FORM

Meritus Connect: M01633

ARRIVAL DATE
 Check in date: _____
 Flight: _____ ETA: _____

DEPARTURE DATE
 Check out date: _____
 Flight: _____ ETD: _____

ROOM TYPE / ROOM RATE
Deluxe Room
 Single S\$300++ per night Double S\$320++ per night
 Room rate inclusive of daily Buffet Breakfast served in Triple Three at Level 5 and in-room Internet access

Meritus Club Room
 Single S\$400++ per night Double S\$400++ per night
 Room rate inclusive of access to Top of the M at Level 38/39, with all day refreshments including daily Buffet Breakfast and internet access

- Room Preferences (subject to availability)**
- Smoking Non-smoking
 - King bedded Twin bedded
 - All room rates are subject to 10% service charge; and 7% Goods Service Tax.
 - Check-in time is at 14:00 hours; check-out time is at 11:00 hours
 - All reservations require credit card guarantee and will receive a confirmation number from the hotel via fax or email.
 - Guarantee policy: Should there be a no-show or cancellation for confirmed reservation, the full duration of room charge will be imposed.
 - All reservations are to be guaranteed upon credit card details received.

LIMOUSINE ARRANGEMENT

Not required

One (1) way limousine transfer from Airport to Hotel at S\$110.00 subject to 7% GST

One (1) way limousine transfer from Hotel to Airport at S\$110.00 subject to 7% GST

Return limousine transfer at S\$220.00 subject to 7% GST

Car pick up between 2300hr - 0700hr, a surcharge of S\$10 + 7% will be levied.
 All pick-ups can be guaranteed upon credit card details received.
 Additional comments/ special requirements: _____

RESERVATION GUARANTEE

Credit Card

Visa Mastercard Amex
 Diners JCB

Credit Card Number: _____

Expiry Date: _____ month _____ year

Cardholder's name: _____

Signature of Cardholder: _____

3rd Asia Agriculture Insurance Conference

Singapore

Mandarin Orchard Hotel

20-Sep-2016 To 21-Sep-2016

Delegates List

Country	Company	Name
Australia		
	AGRI Business Consulting Group Pty Ltd	Brent A Demnar Calem Hoffmann
	Crawford Agriculture	Ken Bullen
	Millennium Underwriting Agencies Pty Ltd	Heath Amber
	Risk Frontiers	Christina Magill
	Transatlantic Reinsurance Company, Sydney Branch	John Byrne
Austria		
	OTT Hydromet GmbH	Ruwin Pandithage Alessandro Morra Bernhard Pacher Caleb Aw
Cambodia		
	BlueOrchard Finance Ltd	Thibaud Ponchon
China		
	Guy Carpenter	Hang Gao
Czech Republic		
	Aon Benfield CEE	Nikolaus Lobkowicz

Country	Company	Name
France		
	Caisse Centrale De Reassurance (CCR)	David Marciano Jean-Marie Douchin
	Liberty Specialty Markets	Salah Dhoub
Germany		
	Hannover Re	Liu Xiaoliang
	R+V Versicherung AG	Laurenz Gunkel
Hong Kong		
	Asiability Group	Michael Schwarz
	Peak Reinsurance Company Limited	Gina Gao
	Taiping Reinsurance Brokers Limited	Tong Zhou
India		
	Afro-Asian Insurance & Reinsurance Brokers (India) Pvt Ltd	Jay Thakker
	General Insurance Corporation of India (GIC Re)	Chandan Verma Shaji Thomas
	HDFC ERGO General Insurance Company Limited	Balachandran MK Samdarshi Singh
	Heritage Insurance Brokers Pvt Ltd	Vaijayanti Varadarajan
	Insurance Regulatory and Development Authority of India	Kondam Mahipal Reddy
	International Reinsurance & Insurance Consultancy Services Pvt Ltd	Raiomond F Poncha

Country	Company	Name
	K M Dastur Reinsurance Brokers	Ayandev Saha
	Life & General Insurance Brokers Pvt Ltd	Anuj Modi Sairam Iyer
	Marsh India Insurance Brokers Private Limited	Himanshu Garg
	Munich Reinsurance Company India Representative Office, Mumbai	Rauniar Subhasis Kumar
	National Insurance Company Ltd	Anupam Kumar Das K B Vijay Srinivas
	Prudent Insurance Brokers Pvt Ltd	Mandar Dalvi Pavanjit Singh Dhingra Vikas Singh
	Risk Care Insurance Broking Services Pvt Ltd	Satya Pal Pawar Sunil Prakash
	The Oriental Insurance Co Ltd	Gaurav Kaushik Nirmala N Dhepe Ved Prakash
	UIB Insurance Brokers (India) Pvt Ltd	Jaya Kurian Kunal Khanna Sailesh Assar
	Weather Risk Management Services	Sonu Agrawal
	Weather Risk Management Services Pvt. Ltd	Jyoti Kumar Garg Mayank Dubey
Indonesia	ASEAN Insurance Council	Teddy Hailamsah

Country	Company	Name
	PT Asuransi Jasa Indonesia	Dani Setiawan Febri Pranurdia Irwan Sofiansyah Rusdi
	PT Marein Tbk	Trinita Situmeang
Iran	Agricultural Insurance Fund of Iran	Mohammad Ebrahim Hassan Nezhad Ramin Aminizare
Japan	Itochu Corporation	Kenyu Kato
	The Toa Reinsurance Company, Limited	Hayato Bingo
Laos	Allianz General Laos (AGL)	Thavone Souliyavong
North Korea	Korea National Insurance Corporation	Paek Ju Hyok
Pakistan	EFU General Insurance Limited	Khurram Nasim Ghuman
Papua New Guinea	Office of Insurance Commissioner	Salamo Elema Tony Morimai
Philippines	GIZ	Antonis Malagardis
	Gotuaco Del Rosario Insurance Brokers, Inc	Arthur L Panganiban Jr

Country	Company	Name
	Gotuaco Del Rosario Insurance Brokers, Inc	Margarete Isleta
Singapore	AgRisk Limited	Mohan Sharma Stephen Stout Wen Chen
	Allianz SE Reinsurance Branch Asia Pacific	Peter Book
	Aon Benfield Asia	Shailendra Sapra
	Aon Benfield Asia Pte Ltd	Chen Wen
	Asia Capital Reinsurance Group Pte Ltd	Anne-Claire Serres Jonathan Wingett
	Asia Insurance Review	Ahmad Zaki Benjamin Ang Chia Wan Fen Mohamad Hyqel
	Asia Risk Transfer Solutions (ARTS)	Alex Chen Jovian Ang
	AXIS Specialty Ltd (Singapore Branch)	Micia Yong
	Caproasia Online	Giovani Anggasta
	Guy Carpenter & Company Pte Ltd	Michael Owen
	J. B. Boda & Co (S) Pte Ltd	Achala Nayak
	JLT Specialty Pte Ltd	Rosie Tan

Country	Company	Name
	Liberty Insurance Pte Ltd	Jacey Teo
	MAPFRE RE Singapore Branch & Labuan Branch	Andres Lorenzana
	Middle East Insurance Review	Cynthia Ang Ridwan Abbas
	MS Amlin Asia Pacific	Rachael Wallington
	MSIG Holdings (Asia) Pte Ltd	Naoyuki Sakaki
	National University of Singapore	Prof Shie-Yui Liong
	Odyssey Reinsurance Company, Singapore Branch	Kelvin Wang
	Sompo Canopus	Tan Wee Ling Tomoko Kawanishi
	Swiss Re Corporate Solutions	Jeffrey Khoo
	Tokio Marine Insurance Singapore Ltd	Masahiro Ishikawa
	TransRe Company Singapore	Samson Chiu Lionel Tay
	TransRe Company Singapore Branch	Eduardo Porcel
	Willis Re	David Bangs
South Korea	Korean Reinsurance Company	Charlotte Kim

Country	Company	Name
Sri Lanka		
	National Insurance Trust Fund Board	Sanath De Silva
Switzerland		
	BlueOrchard Finance	Ernesto Costa Platero
	CelsiusPro	Mark Rueegg
Taiwan		
	Financial Supervisory Commission	Rina Huang
	National Taipei University	Chen Shu-Ling
Thailand		
	Office of Insurance Commission (OIC), Thailand	Prepatsorn Naksuk Tadsanawan Chaodamrongsakul
	Southeast Insurance Public Company Limited	Bundit Prarakkamo
Ukraine		
	AgroInsurance International LLC	Ian Shynkarenko Roman Shynkarenko
United Kingdom		
	AgRisk	Charles Clarke
	Guy Carpenter & Co Ltd	Simon Ellis
	J. B. Boda & Co (UK) Ltd	Aashit Dhanki
	NDI Insurance & Reinsurance Brokers Limited	Pieter Vlasbloem

Country	Company	Name
United States of America		
	The Toa Reinsurance Company of America	Andrea Shi
	Whyte Daimin Investments Ltd	John Milligan-Whyte
Zimbabwe		
	The Afro News	Chiyedzo Josiah



Stephen Stout

Executive Chairman and CEO, AgRisk Limited, Singapore

Conference Chairman

Mr Stout is Executive Chairman and CEO of AgRisk based in Singapore. He was previously with the Daily Mail Group, where he was CEO of its Landmark Information Group. He was later appointed to the newly formed position of CEO dmg::information Asia Pacific to

develop dmg::i's presence in the Asia Pacific markets.

Mr Stout is also a Non-Executive Director of dmg::events, Landmark Information Group and the Indian educational publisher iProf.



Dr Antonis Malagardis

Program Director, Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia (RFPI Asia), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Philippines

Implementing the Micro-Agri Regulatory Framework in the Philippines

Dr Malagardis joined GIZ in 2009 as Program Manager of the Microinsurance Innovations Program for Social Security (MIPSS) in the Philippines. In January 2013, he was named Program Director of a BMZ-funded regional program on Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia (RFPI Asia), which aims to advise insurance regulators and supervisors in selected countries in Asia on inclusive insurance, strengthen the capacity development of their staff and enhance knowledge-sharing on insurance for low-income persons.

Dr Malagardis' assignments as advisor in 22 countries cover risk management, social insurance, pension finance, health finance, public-private partnerships, microfinance and microinsurance and lately, disaster risk finance schemes at the policy design, supervision as well as product development level.

Dr Malagardis studied law and economics at the University of Athens and received his PhD in Berlin in the field of Institutional Economics on the topic of "Sovereign Risk and Insolvency of States" in 1989.

2



Professor Shie-Yui Liong

Deputy Director, Tropical Marine Science Institute, National University of Singapore

Impacts of Climate Change on Mekong River Delta's Rice Crop Yields; & Panel on Agriculture Risk Modelling

Prof Liong has been with the Tropical Marine Science Institute of the National University of Singapore (NUS) since 2004, after spending about 20 years with the Department of Civil and Environmental Engineering of NUS. His most recent research focus is on climate downscaling for Southeast Asia and deriving valuable information from the downscaled climate to evaluate the impact of climate change on water resources, flooding, drought, crop yields, etc.

Prof Liong is currently Editor of the Journal of Environmental Science and Policy and former Editor of

the Journal of Hydroinformatics. He was the President of the Hydrological Science Section of AOGS (2008-2010) and Chairman of the Joint IAHR-IWA-IAHS Hydroinformatics Committee (2009-2012). He is also a three-time recipient of the Best Paper Award of IAHR-APD Congress (in 1994, 2002 and 2012). In 2007, he was awarded by the President of Federal Republic of Germany the Order of Merit ("Bundesverdienstkreuz").

Prof Liong received his Dipl.-Ing. and PhD from the University of Karlsruhe (Germany) and the Iowa Institute of Hydraulics Research of University of Iowa (USA), respectively.



Peter Book

Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore

Key Factors for Sustainable Agriculture Insurance Systems; & Moderator, Special Focus - Impact of Technology in Agriculture Insurance

Mr Book is Head of Agriculture for the Asia Pacific region and is part of Allianz's Global Agriculture team. Working together with Allianz Group Companies and third party entities, he oversees the development of agriculture insurance and reinsurance in the Asia Pacific region.

Prior to joining Allianz, he was at Guy Carpenter as Head of Agriculture Asia Pacific leading the regional agriculture specialty practice with responsibility for the development, execution and deployment of sales and technical strategy across the region. Prior to Guy Carpenter, he spent nine

years as a Senior Underwriter and then Underwriting Manager of Primacy Underwriting Agency (now part of the Allianz Group), responsible for the full spectrum of Agriculture Insurance in Australia and New Zealand.

Mr Book holds a Bachelor of Applied Science degree in Systems Agriculture from the University of Western Sydney in Australia. He is a Fellow of the Australian and New Zealand Institute of Insurance and Finance (ANZIIF) and a member of the Australasian Institute of Chartered Loss Adjusters (AICLA).



Jeffrey Khoo

Vice President & Senior Originator Global Food and Agriculture, Swiss Re Corporate Solutions, Singapore

Risk Management Solutions for Agriculture Corporates in the Food and Agriculture Chain

Mr Khoo is Vice President and Senior Originator at Swiss Re Corporate Solutions for the Food and Agriculture Business. He is responsible for business development and origination for Agriculture Insurance for Southeast Asia and China.

Prior to joining Swiss Re, he was Director of Agribusiness at private equity firm Caudex Asia. Previously, he was Deputy CEO of Green Agritech International Ltd, a fertilizer manufacturer based in Suzhou, China. In 2007 he was the General Manager of Singapore Stock Exchange-listed

agriculture and biotechnology company, Guangzhao IFB.

Mr Khoo is the current Honorary Assistant Treasurer and Chairman of Intellectual Pursuit at the National University of Singapore Society, Honorary Adviser to the Myanmar Rice Traders Association, Chairman of the NUSS General Election Political Dialogue and the former Chairman of People's Association PMET Industry Guru Series.

Mr Khoo graduated with honours in Botany from the National University of Singapore in 1994.



Hang Gao

Vice President, Guy Carpenter, China

Big Data and Sustainable Insurance for Agriculture

Mr Gao is Vice President at Guy Carpenter, China. His work focuses on Asia Pacific model validation and model development. Prior to joining Guy Carpenter, he was Asia Pacific representative of RMS and served as a Board Director of China Insurance Institute. He was also involved

in the development of RMS China's typhoon model and led part of the project.

Mr Gao received his Bachelor degree from Tsinghua University (China) and PhD degree from Oxford University (UK).



Salah Dhouib

Class Underwriter – Agriculture, Liberty Specialty Markets, France

Dynamics of Developing a Weather Index Product: Feasibility, Scalability and Sustainability; & Panel on Agriculture Risk Modelling

Mr Dhouib started his professional career as a consultant in the IT sector. He embraced several positions as an analyst, a software engineer and a project leader in AXA Re IT Department both in Paris and New York City. He joined the Weather Derivative Department of AXA Re as an underwriter in November 2002. He helped make AXA Re, then Paris Re, among the few market players active both in weather derivatives and index based

reinsurance.

He moved to Liberty Syndicates Paris in September 2010 to join the newly created Weather and Agriculture Department. The team, based in Paris, underwrites and manages the Syndicates worldwide weather and agriculture book.

Mr Dhouib graduated from top French engineering school Ecole Centrale de Lyon.



Wen Chen

Sales Director—Asia, AgRisk Limited, Singapore

An Overview of China Agriculture Insurance

Mr Chen is based in AgRisk's Singapore office. He was previously Sales Director of Asia for RMS and, before that, Head of Risk Management Services and Solutions for Marsh in Greater China.

Mr Chen speaks Mandarin, Cantonese, English and

German. He also features as a guest columnist for risk management topics in China.

Mr Chen has a B.Sc. in Biology from Nanjing University, China, and an MBA in Finance & Banking from the University of St. Gallen, Switzerland.



Heath Amber

Managing Director, Millennium Underwriting Agencies Pty Ltd, Australia

Development of Agriculture Insurance in Australia

Mr Amber entered the insurance industry in 1995, working with Australian insurers and insurance brokers. In 1998 he joined his family business MGA Insurance Brokers as a broker. He then moved to the UK with Bowood Partners PLC, a Lloyd's of London broker, developing and managing the Australian general agency business of Millennium Underwriting Agencies. In 2004 he returned to Australia and commenced placing property and casualty insurance into Lloyd's on behalf of Millennium.

In 2008 he assumed the Australian management of Millennium's Agricultural portfolio consisting of Farm and Crop insurance.

Presently, Mr Amber is Managing Director of Millennium Underwriting Agencies Pty Ltd, immediate past Chairman and current Director of the Underwriting Agencies Council of Australia Ltd, the national Underwriting Agency peak body and represents a number of Australian insurance industry and non-industry Boards.



Trinita Situmeang

Associate Director - General Reinsurance, PT Marein Tbk, Indonesia

Indonesian Agricultural Insurance - Opportunities and Challenges

Ms Situmeang has 12 years' experience in underwriting property and casualty. Her interest in agriculture insurance started when she developed a tree-growing insurance package which involved site survey, setting terms

and conditions, reinsurance structure as well as claims management of palm oil plantations.

Ms Situmeang obtained her Bachelor degree from Bogor Agricultural Institute, Indonesia.



Himanshu Garg

Actuary, Marsh India Insurance Brokers Private Limited

Indian Crop Insurance: Opportunities and Challenges for Reinsurers

Mr Garg is an Actuary and Chartered Accountant who is active in creating Agriculture Reinsurance capacity and solutions for Indian insurers. Presently with Marsh India, he is working with several Indian insurers to develop relevant reinsurance solutions in Agriculture in addition to traditional risks such as Property.

Prior to this, Mr Garg was associated with Prudential Plc in Solvency II domain and has more than 10 years of professional experience. In 2011, The Economic Times (India's largest business daily) honoured him as one of Top 50 Young Leaders.



Sonu Agrawal

Managing Director, Weather Risk Management Services, India

Moderator, Panel on Agriculture Risk Modelling

Mr Agrawal is the Founder and Managing Director of Weather Risk Management Services Pvt. Limited (WRMS). Founded in 2004, WRMS pioneered the development of the Weather Index Insurance market in India, especially for the Agriculture sector. Over last 12 years, it has grown into a comprehensive global Climate Risk Management company with a fast growing footprint that spans across India, Africa and Asia and served over a million farmers to date.

A first generation entrepreneur, Mr Agrawal is an Indian Institute of Technology graduate where he studied Physics. He is also an alumnus of the Indian Institute of Management. His creative leadership has been instrumental in success of WRMS in conceptualising and implementing some exceptional index insurance initiative in India. Collectively, his team would rank among the top index insurance innovators in the world.



Rachael Wallington

Senior Underwriter, International Reinsurance, MS Amlin Asia Pacific, Singapore

Panel on Agriculture Risk Modelling

Ms Wallington is a Senior Underwriter, International Reinsurance, at MS Amlin with a focus on driving the development of the Asia Pacific agriculture portfolio. Prior to joining MS Amlin, she worked for Munich Re, Singapore where she had lead underwriter responsibility for Indonesia, as part of the Property Treaty team.

Ms Wallington's career started in 2002 and has included

various actuarial and underwriting positions in London, Bermuda and Singapore. She is a qualified actuary and has experience in both Property and Specialty lines. Her agriculture experience includes four years at Montpelier Re in Bermuda where she drove the strategic direction of the North American Crop Insurance book, writing a broad portfolio of US MPCI and Canadian Stop Loss treaties.



Andrea Shi

Vice President, Agricultural, The Toa Reinsurance Company of America, USA

Panel on Agriculture Risk Modelling; & Special Case Study on Innovative Risk Modelling – California Specialty Crops

Ms Shi is Vice President of Toa Reinsurance Company of America. In her role, she leads the efforts of conducting agricultural risk modelling and R&D, reinsurance pricing, portfolio optimisation, and other technical aspects of agricultural reinsurance underwriting.

Ms Shi has over ten years of experience in data mining and statistical modelling. She has been involved

in developing multiple insurance programmes for both crops and livestock. Prior to joining Toa, she worked for Endurance Reinsurance of America as a Senior Statistical Modeller in its Agricultural Division.

Ms Shi holds a Bachelor of Science degree in Computer Science and a Master of Science degree in Statistics from University of Toronto.



Dr Mohan Sharma

Risk Consultant, AgRisk Limited, Singapore

Panel on Agriculture Risk Modelling

Dr Sharma has over 25 years of work experience with reinsurance intermediaries, CAT modelling companies in property and agriculture, engineering design and consulting companies and academia in Singapore, the U.S.A. and Nepal. Since November 2015, he has been working as an Independent Consultant in the areas of risk modelling and analytics in cyber, agriculture and property.

Dr Sharma previously served as Head of Analytics, Asia, and then Head of R&D, Asia Pacific, at Aon Benfield, Singapore, CEO of a start-up property CAT modelling

company, Director (Modelling) at an agriculture CAT modelling company and Independent Consultant. Prior to that, he was with Risk Management Solutions (California) where he led teams in CAT model development. He was also an invited member of the Industry Review Committee, Institute of Catastrophe Risk Management, Nanyang Technological University.

Dr Sharma has taught undergraduate and graduate classes in the USA (Santa Clara University) and Nepal (Institute of Engineering).



Liu Xiaoliang

Underwriter, Agricultural Risks, Hannover Re, Germany

Agriculture Risk Management and Insurance: A Reinsurer's View

6

Mr Liu works at Hannover Re as Underwriter responsible for Agricultural Risks in Asia. Prior to that, he worked as Research Fellow at Humboldt University in Berlin.

Mr Liu did his Bachelor in International Economics and Trade in China and received his Master degree in Agricultural Economics at Humboldt University.



Alex Chen

Founder and CEO, Asia Risk Transfer Solutions, Singapore

Agriculture Insurance for the Masses – Livelihood Insurance for the Farmers

Mr Chen is the Founder and CEO of Asia Risk Transfer Solutions (ARTS). Over the past couple of years, he has worked closely with the Founder of RMS, Professor Haresh Shah, to devise new strategies of insuring the masses in Asia. Together, they developed a solution that transforms the way insurance is priced, distributed, underwritten and losses settled.

It was in this spirit that they co-founded ARTS in January 2016, with the goal of developing affordable and

easy to understand insurance products to the masses. With ARTS, Mr Chen sets his sights on building a purposeful business as an agent of change and a force for good — bringing financial and risk transfer innovations to the people who need them most.

Mr Chen received his B.EngSc. and M.Sc. degrees from Nanyang Technological University, Singapore, and is the winner of numerous accolades and innovation awards.



Jovian Ang

Vice President, Business Development, Asia Risk Transfer Solutions, Singapore

Agriculture Insurance for the Masses – Livelihood Insurance for the Farmers

Mr Ang is a recipient of the prestigious Nanyang Scholarship Award and was a global finalist at the 2015 Global Mobile Challenge held in Barcelona. A firm believer of a better tomorrow, his experience growing up inspired him to bring positive change to the world we live in. Driven by this passion, he joined ARTS as a core

member of the team to advance risk transfer innovations to protect livelihoods and empower lives.

Mr Ang received his B.EngSc. degree from Nanyang Technological University and is nearing the completion of his M.Sc. (Technology Management) degree at the Nanyang Business School.



Ian Shynkarenko

CEO & Co-Founder, AgroInsurance International LLC, Ukraine/Georgia

Managing Agricultural Claims/Loss Handling - Assessment Methods and New Techniques

Mr Shynkarenko is the Founder and CEO of AgroInsurance International LLC, which has operating representative offices in Ukraine and Georgia delivering consulting services in Ukraine, Georgia, Azerbaijan, Armenia, Serbia, Kazakhstan and other countries of Europe and Asia.

He has been active as a market professional in agricultural insurance since 2009. In 2014, he gained official

certification in loss adjustment for agricultural insurance.

Mr Shynkarenko's main areas of professional activities include loss adjustment approaches and methodologies in agricultural insurance; agricultural insurance analysis, program audits and market research; insurance products development and underwriting; as well as use of satellite and drone technologies for agricultural insurance in loss adjustment and crop monitoring.



Teddy Hailamsah

Senior Advisor to Secretary General, ASEAN Insurance Council; & President Director, PT Asuransi Central Asia, Indonesia

Agriculture Micro Insurance – A Missing Puzzle in Developing Indonesia's Sustainable Agriculture; & Moderator, Panel on Multi-Stakeholder Dialogue on Catastrophe Risk Protection and Microinsurance For Rural Communities

Mr Hailamsah started his career as a Building Material Purchaser when he first joined PT Asuransi Central Asia (ACA) in 1976 after his return from South East Asian Union College in Singapore with a major in Business Administration. His hands-on building material purchaser role allowed him to pick up risk assessment and survey skills for the next two years of his career. Subsequently, he was transferred to subsidiary CAR Life Insurance for one year to learn the skills of marketing agency forces. Upon his return to ACA, he was promoted to Marketing Senior Supervisor.

From 1982 to 1984, Mr Hailamsah was Underwriting Manager and he was later promoted to General Manager Marketing Division (1985), Deputy Managing Director (1987), Managing Director (1988) and President Director (1996).

Mr Hailamsah was ASEAN Insurance Council Secretary General (1999-2011), and President of the 26th East Asia Insurance Congress (2010-2012). In February 2012, the PM of Cambodia bestowed on him the honour of 'Sahametrei' for his contribution to insurance industry development in Cambodia.



Shailendra Sapra

Associate Director, Global ReSpecialty, APAC, Aon Benfield Asia, Singapore

Challenges in Agriculture Insurance in Asia and How to Overcome Them

Mr Sapra joined Aon Benfield in November 2010. He has performed reinsurance optimisation studies for clients by building Dynamic Financial Analysis (DFA) models for assessing both CAT (single and multi-perils) and non-CAT risks using Remetrica for the last three years. He is familiar with using exposure rating tools and experience models to understand clients' potential losses and expected benefit of various reinsurance programmes.

He later moved to the agriculture placement team. For

the past year, he has been placing Crop, Livestock and Aquaculture risks. He is also involved in Asia Pacific Cyber Practice Group and is responsible for business development in Cyber insurance/reinsurance in Asia.

Mr Sapra graduated with a Bachelors of Engineering in Electrical and Electronics Engineering from Nanyang Technological University, Singapore. He is currently studying for his professional qualification as a Fellow of Institute of Actuaries, UK.



Ayandev Saha

General Manager, K M Dastur Reinsurance Brokers, India

Panel on Multi-Stakeholder Dialogue on Catastrophe Risk Protection and Microinsurance For Rural Communities

Mr Saha has 10 years of design and implementation experience in universal pension, life, health and agriculture insurance products in Asia and Africa. He has worked extensively in the areas of micro insurance product development, relationship management and facilitating tie-ups with partners and donors to provide insurance solutions to the low income households. He also spent several years working in the mainstream insurance sector at Edelweiss Tokio Life Insurance and ICICI Prudential Life Insurance.

Over the years, Mr Saha has advised governments and regulators in Afghanistan, Bangladesh, Pakistan, Rwanda, South Africa and India on various social security

schemes, insurance regulations and strategies for building mass markets. In 2015, he was involved in USAID - FAIDA (Financial Access for Investing in the Development of Afghanistan) project in Kabul, Afghanistan and developed a strategy and implementation plan for microinsurance and credit insurance in Afghanistan.

Mr Saha has authored articles, papers, monographs and training manuals on various risk management and insurance topics including regulation and supervision. He also conducted international workshops organised by donors, regulators and associations in Kenya, Bangladesh, Afghanistan, Indonesia, Vietnam and India.



Michael Schwarz

Managing Director, Asiability Group, Hong Kong

Panel on Multi-Stakeholder Dialogue on Catastrophe Risk Protection and Microinsurance For Rural Communities

Mr Schwarz is Managing Director of Asiability Group, an independent management consultancy firm which helps clients from the private and public sectors by offering tailored and forward thinking solutions while harmonising them with the specific contours of different Asian cultures.

Prior to that, Mr Schwarz established Swiss Re's footprint as risk transfer partner for the public sector across various jurisdictions in Asia. As Head of East-Asia Global Partnerships, he covered Swiss Re's full range of (re) insurance and capital markets products and maintained a strong focus on product development, in particular on

parametric/index solutions when working on transactions and initiatives with governments, multilaterals, regulatory bodies and local insurance industries. Before he moved to Hong Kong in 2011, he was based in Zurich as a Client Manager within Division Insurance & Specialty and Public Sector Business Development. He gathered his first insurance expertise at Allianz and started his professional career in commercial and private banking at Deutsche Bank.

Mr Schwarz holds a Master degree in Chinese Studies, Political Sciences and Psychology from Ludwig-Maximilians-University Munich, complemented by overseas studies at National Taiwan Normal University.



Dr Kiyanoush Ghalavand

Superior International Adviser in Agricultural Economics (Natural Disaster, Risks and Insurance)

Panel on Multi-Stakeholder Dialogue on Catastrophe Risk Protection and Microinsurance For Rural Communities

Dr Ghalavand served as Researcher in Panjab University, India. He is also Member of several academic bodies with a focus on Natural Disaster for Agriculture and Environmental Economics Studies.

Dr Ghalavand has authored more than 50 research papers in various journals and is one of the Guest Editors for the Special Issues "Agriculture Ecosystems and Environments" under the journal Agriculture, Forestry and Fisheries (AFF). In 2015, he won the Gold Medal at

the International Research and Innovation Festival for outstanding research work for his book titled Disaster Management and Strategies. He is also a Gold Medallist among Ph.D. exam candidates and received accolades for his outstanding contribution in teaching and research in Iran and India.

Dr Ghalavand received his M.Sc. and Ph.D. respectively from Science and Research University of Tehran, Iran, and Panjab University, India.



Mark Rueegg

CEO, CelsiusPro, Switzerland

Special Focus - Impact of Technology in Agriculture Insurance

Mr Rueegg founded CelsiusPro in 2008. In his role as CEO, he leads a variety of projects related to weather risk mitigation involving several stakeholders such as re(insurers), microfinance institutions, multinational institutions and governmental organisations. He has also been on the Board of Directors of the Weather Risk Management Association (WRMA) since 2012.

Prior to that, as a Chartered Financial Analyst (CFA), Mr Rueegg spent several years with a leading investment

bank with in-depth experience in the area of FX Cash and Collateral Trading. In his last role as Director at UBS Investment Bank London, he was responsible for FX Prime Brokerage Sales where he advised hedge funds and broker/dealer firms in risk management, processes and trading platforms.

Mr Rueegg holds an MBA from the University of Rochester in New York and the University of Bern.



Andrés Lorenzana

Principal Officer, MAPFRE RE Singapore Branch & Labuan Branch

Special Focus - Impact of Technology in Agriculture Insurance

Mr Lorenzana joined MAPFRE RE as Senior Regional Manager of Europe in 2003. In 2005 he was appointed Global Head of Agriculture before his most recent move to Singapore to become Principal Officer of MAPFRE RE's Singapore branch, where he is responsible for ASEAN countries and Korea.

He started his career in Swiss Re. In 1991 he headed

the operation in its Argentina office and later returned to the head office as Market Partner and Member of Senior Management in the Latin America Division. In 2001 he was appointed as Director and Head of Industry Practice in Swiss Re's Financial Services Business Group.

Mr Lorenzana holds a degree in Economics from the University of León in Spain.

Sponsors' Profiles

AgRisk

AgRisk was the first company to focus on risk faced by the agricultural sector in Asia. Founded as Asia Risk Centre in 2011, AgRisk is expanding its presence globally with new solutions across the spectrum of agriculture risk management. AgRisk is the only dedicated modelling and analytics company in the agriculture domain. AgRisk's primary focus is on markets with a strong agriculture base, providing agriculture risk models, analytical services and consulting expertise.

AgRisk's team members include some of the most

respected catastrophe and agriculture-climate modellers in the industry as well as insurance, reinsurance and risk transfer specialists. AgRisk has offices in Singapore, India and London with expertise including catastrophe risk modelling, agro-climate science, meteorology, agriculture science, engineering, actuarial science and software development.

www.agriskhub.com

Guy Carpenter

Guy Carpenter & Company, LLC is a leading global risk and reinsurance specialist. Since 1922, the company has delivered integrated reinsurance and capital market solutions to clients across the globe. As a most trusted and valuable reinsurance broker and strategic advisor, Guy Carpenter leverages its intellectual capital to anticipate and solve for a range of business challenges and opportunities on behalf of its clients. With over 2,300 professionals in more than 60 offices around the world, Guy Carpenter delivers a powerful combination of broking expertise, strategic advisory services and industry-leading analytics to help clients achieve profitable growth. For more information on Guy Carpenter's complete line-of-business expertise and range of business units, including GC Specialties, GC Analytics®, GC Fac®, Global Strategic Advisory, GC Securities*, Client Services and GC Micro Risk Solutions®, please visit www.guycarp.com and follow Guy Carpenter on LinkedIn and Twitter @GuyCarpenter.

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and risk management; Mercer, a leader in talent, health, retirement, and investment consulting; and Oliver Wyman, a leader in management consulting. Marsh & McLennan is committed to being a responsible corporate citizen and making a positive impact in the communities in which it operates. Visit www.mmc.com for more information and follow us on LinkedIn and Twitter @MMC_Global.

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www.guycarp.com

Weather Risk Management Services Private Limited

Weather Risk Management Services Private Limited (WRMS) is a pioneering climate risk management company with a vision to secure smiles vis-à-vis the threats of climate change. Using innovation in data, technology and financial services, it offers a comprehensive portfolio of solutions for the most daunting challenges and risks related to climate change. WRMS has transformed the lives of over 1 million farmers in India, equipping them against weather related risks. The company has also contributed significantly to the surge in crop insurance across the country directly contributing to taking the weather insurance sector from Rs. 3 Billion to Rs. 50 Billion in less than 10 years.

Founded in 2004, WRMS offers a range of smart products that improves productivity in diverse sectors. Supported by a strong research team with experience in disciplines such as Financial Engineering, Computer Science, Electronics, Atmospheric Physics, Climatology, Nano-Sciences and Biotechnology, WRMS constantly pushes the envelope to create effective customized solutions for its clients, from

institutions, governments and large corporations to poor peasants in the remotest of villages.

Through its own network of 2000 weather stations across the country, WRMS has deployed an advanced big data platform to monitor weather events on a national and global scale as well as offer weather forecasts and weather insurance services to a diverse set of clients. WRMS services for the agriculture sector include precision farming techniques, farm level risk management and crop insurance powered by smart IT practices including land surveying, remote sensing and GPS tracking. Connected to all the entities in the agricultural value chain, it offers solutions for over 150 crops and 30 agri-ecological systems across India, Bangladesh, Sri Lanka, Cambodia, Philippines and South Africa. WRMS is also the biggest implementation agency for the National Crop Insurance Programme (NCIP) across India.

www.weather-risk.com

3rd Asia Agriculture Insurance Conference

20-21 September 2016, Mandarin Orchard Hotel, Singapore

PROGRAMME

Day One: 20 September 2016, Tuesday

8.00 am	Registration & Coffee
9.00 am	Welcome Address by Conference Chairman <i>Stephen Stout, Executive Chairman and CEO, AgRisk Limited, Singapore</i>
9.10 am	Implementing the Micro-Agri Regulatory Framework in the Philippines <i>Dr Antonis Malagardis, Program Director, Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia (RFPI Asia), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Philippines</i>
9.40 am	Impacts of Climate Change on Mekong River Delta's Rice Crop Yields <i>Prof Shie-Yui Liong, Deputy Director, Tropical Marine Science Institute, National University of Singapore</i>
10.10 am	Key Factors for Sustainable Agriculture Insurance Systems <i>Peter Book, Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore</i>
10.40 am	Q&A
10.50 am	Tea Break Hosted by Weather Risk Management Services

Agriculture Insurance Today - Opportunities and Challenges

11.15 am	Risk Management Solutions for Agriculture Corporates in the Food and Agriculture Chain <i>Jeffrey Khoo, Vice President & Senior Originator Global Food and Agriculture, Swiss Re Corporate Solutions, Singapore</i>
11.40 am	Big Data and Sustainable Insurance for Agriculture <i>Hang Gao, Vice President, Guy Carpenter, China</i>
12.10 pm	Dynamics of Developing a Weather Index Product: Feasibility, Scalability and Sustainability <i>Salah Dhoub, Class Underwriter - Agriculture, Liberty Specialty Markets, France</i>
12.35 pm	Q&A
12.45 pm	Lunch

Agriculture Insurance Markets in the Region

2.00 pm	This session will look at trends and developments of agriculture insurance in various markets with a view to draw strategic tips and lessons An Overview of China Agriculture Insurance <i>Wen Chen, Sales Director—Asia, AgRisk Limited, Singapore</i> Development of Agriculture Insurance in Australia <i>Heath Amber, Managing Director, Millennium Underwriting Agencies Pty Ltd, Australia</i> Indonesian Agricultural Insurance - Opportunities and Challenges <i>Trinita Situmeang, Associate Director - General Reinsurance, PT Marein Tbk, Indonesia</i> Indian Crop Insurance: Opportunities and Challenges for Reinsurers <i>Himanshu Garg, Actuary, Marsh India Insurance Brokers Private Limited</i>
3.00 pm	Q&A

Panel: Agriculture Risk Modelling

3.10 pm	This panel will look at the changing risk landscape of the farming community in Asia and how risk modelling can boost the agriculture sector's resilience: - How Agriculture Risk Modelling Has Evolved to Meet Needs of the Rapidly Changing Risk Environment - Challenges of Modelling Agriculture Risks in Emerging Markets - Case Studies on Innovative Risks Modelling Moderator: <i>Sonu Agrawal, Managing Director, Weather Risk Management Services, India</i> Panellists include: • <i>Salah Dhoub, Class Underwriter - Agriculture, Liberty Specialty Markets, France</i> • <i>Prof Shie-Yui Liong, Deputy Director, Tropical Marine Science Institute, National University of Singapore</i> • <i>Rachael Wallington, Senior Underwriter, International Reinsurance, MS Amlin Asia Pacific, Singapore</i> • <i>Andrea Shi, Vice President, Agricultural, The Toa Reinsurance Company of America, USA</i> • <i>Dr Mohan Sharma, Risk Consultant, AgRisk Limited, Singapore</i>
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4.00 pm Tea Break and End of Day One

Day Two: 21 September 2016, Wednesday

New Business Trends

9.00 am	Agriculture Risk Management and Insurance: A Reinsurer's View <i>Liu Xiaoliang, Underwriter, Agricultural Risks, Hannover Re, Germany</i>
9.30 am	Special Case Study on Innovative Risk Modelling - California Specialty Crops <i>Andrea Shi, Vice President, Agricultural, The Toa Reinsurance Company of America, USA</i>
10.00 am	Agriculture Insurance for the Masses - Livelihood Insurance for the Farmers <i>Alex Chen, Founder and CEO; & Javian Ang, Vice President, Business Development, Asia Risk Transfer Solutions, Singapore</i>
10.30 am	Q&A
10.40 am	Tea Break
11.00 am	Managing Agricultural Claims/Loss Handling - Assessment Methods and New Techniques <i>Ian Shynkarenko, CEO & Co-Founder, AgroInsurance International LLC, Ukraine/Georgia</i>
11.30 am	Agriculture Micro Insurance - A Missing Puzzle in Developing Indonesia's Sustainable Agriculture <i>Teddy Hailamsah, Senior Advisor to Secretary General, ASEAN Insurance Council; & President Director, PT Asuransi Central Asia, Indonesia</i>
12.00 pm	Challenges in Agriculture Insurance in Asia and How to Overcome Them <i>Shailendra Sapra, Associate Director, Global ReSpecialty, APAC, Aon Benfield Asia, Singapore</i>
12.30 pm	Q&A
12.40 pm	Lunch

2.00 pm	Panel: Multi-stakeholder dialogue between the insurance industry and government agencies on catastrophe risk protection and microinsurance for rural communities - Catastrophe Risk and Agriculture: Different Catastrophe Events and Impact on Portfolios - Future Outlook on Catastrophe Risks - The Value Proposition of Microinsurance Linked to the Agricultural Value Chain - Challenges: Building Trust and Financial Literacy, Efficient Distribution and Administration, Data, New Products - Case Studies of Innovative Agriculture Microinsurance Project Set-Ups
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Moderator:

Teddy Hailamsah, Senior Advisor to Secretary General, ASEAN Insurance Council; & President Director, PT Asuransi Central Asia, Indonesia

Panellists include:

- *Ayandeve Saha, General Manager, K M Dastur Reinsurance Brokers, India*
- *Michael Schwarz, Managing Director, Asiability Group, Hong Kong*
- *Dr Kiyanoush Ghalavand, Superior International Adviser in Agricultural Economics (Natural Disaster, Risks and Insurance)*

Special Focus - Impact of Technology in Agriculture Insurance

2.45 pm	Panellists will discuss: - Innovations in Agriculture Technology - Challenges and Opportunities for (Re)insurers - Satellite/Remote Sensing Technology: How This Mapping Technology Has Changed the Agriculture Insurance Landscape & Latest Development - How Can Success Stories in Europe Be Adopted in Asia Moderator: <i>Peter Book, Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore</i> Panellists include: • <i>Mark Rueegg, CEO, CelsiusPro, Switzerland</i> • <i>Andrés Lorenzana, Principal Officer, MAPFRE RE Singapore Branch & Labuan Branch</i>
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3.30 pm Tea Break & End of Conference



Dealing with risks in Agriculture - Implementing the MicroAgri Regulatory Framework in the Philippines

Dr. Antonis Malagardis, GIZ

*3rd Asia Agriculture Insurance Conference
20-21 September 2016,
Mandarin Orchard Hotel, Singapore*



Outline

- Dealing with risks in agriculture
- Basic figures on agri- and (micro) insurance
- The case of the Philippines
- Highlights of Micro-Agri Regulatory Framework
- Looking ahead



Dealing with risk in agriculture Ex-ante & Ex-post measures

- Farmers and rural households face many risks, including systemic risks
- Rural households often minimize risks rather than maximize profits
- Farmers have limited access to credit & other financial services
- Indemnity-based crop insurance is not sustainable in general
- Ex-ante risk reduction results in better management and reallocation of resources towards revenue maximization rather than risk minimization
- Ex-post cash relief results in better coping with damage & loss

3



198 million insured farmers worldwide

Key Drivers

- Index-based Insurance techniques
- Public subsidies
- Chinese Agri Insurance



4



SCALE OF AGRICULTURAL INSURANCE IN 2014

AFRICA		
SCALE (NO. OF POLICYHOLDERS)		0.65 MILLION
NO. OF SCHEMES		18
WEIGHTED AVERAGE SUBSIDY (EST.)		37%
INDIA		
SCALE (NO. OF POLICYHOLDERS)		33.2 MILLION
NO. OF SCHEMES		4
WEIGHTED AVERAGE SUBSIDY (EST.)		64%
CHINA		
SCALE (NO. OF POLICYHOLDERS)		160 MILLION
NO. OF SCHEMES		X
WEIGHTED AVERAGE SUBSIDY (EST.)		77%
REST OF ASIA		
SCALE (NO. OF POLICYHOLDERS)		1 MILLION
NO. OF SCHEMES		7
WEIGHTED AVERAGE SUBSIDY (EST.)		64%
LATIN AMERICA		
SCALE (NO. OF POLICYHOLDERS)		3.3 MILLION
NO. OF SCHEMES		8
WEIGHTED AVERAGE SUBSIDY (EST.)		91%



Agricultural insurance in China

Year	Sum Insured (bn US\$)	Premium (bn US\$)	Payout (bn US\$)	Loss Ratio	Gov Subsidies (bn US\$)	Gov Subsidies as % of Premium	No. of Claims (mln)	Policies (mln) ⁶
2012	142.5	3.8	2.1	55%	2.9	76%	28.2	183
2013	224.4	4.9	3.4	68%	3.8	77%	33.7	214
2014	269.9	5.3	3.5	66%	4.1	77%	35	247
2015	314.2	6	4.2	69%	-	-	-	230



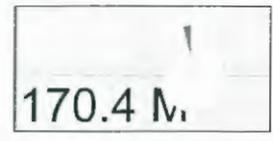
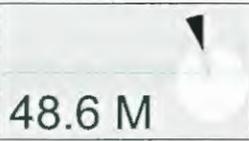
Microinsurance Key figures by region

LAC: 2014

Africa: 2014

Asia: 2014

Lives covered



Gross written premiums (USD)



828 M

756 M

829 M

Claims paid



26%

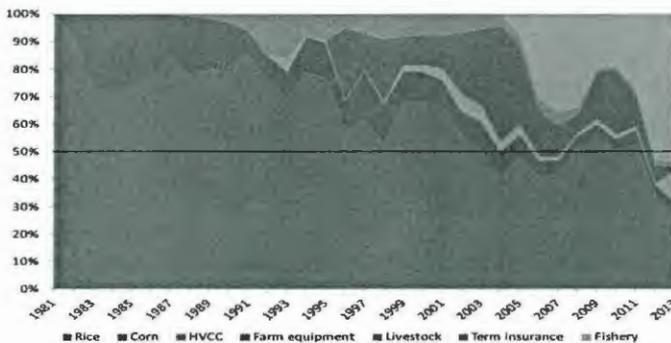
32%

79%

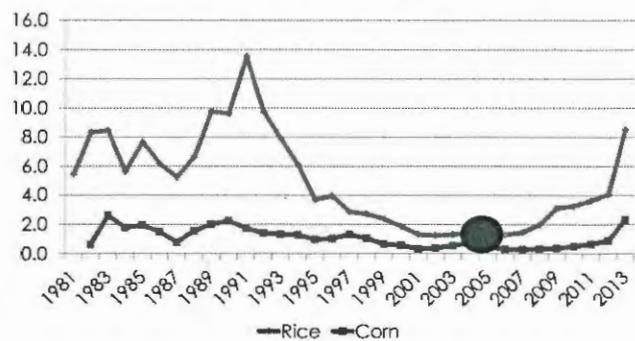
Types of products offered (millions of lives covered, including secondary covers)



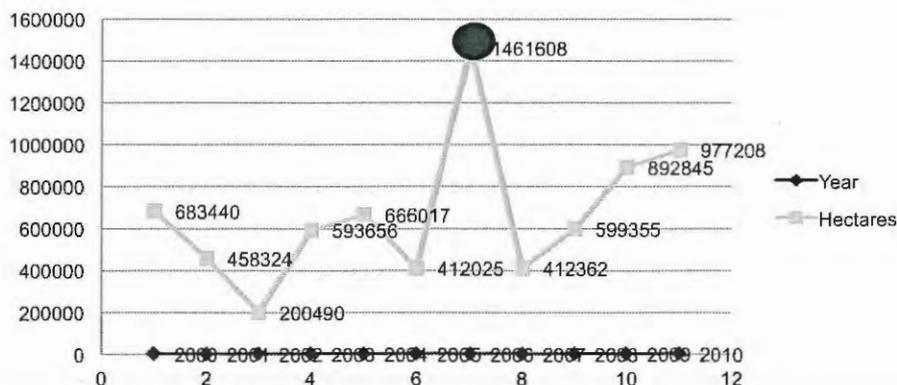
Share of insurance product to total amount of insurance cover (in %), 1981-2013



Penetration rates* for rice and corn insurance (%), 1981-2013



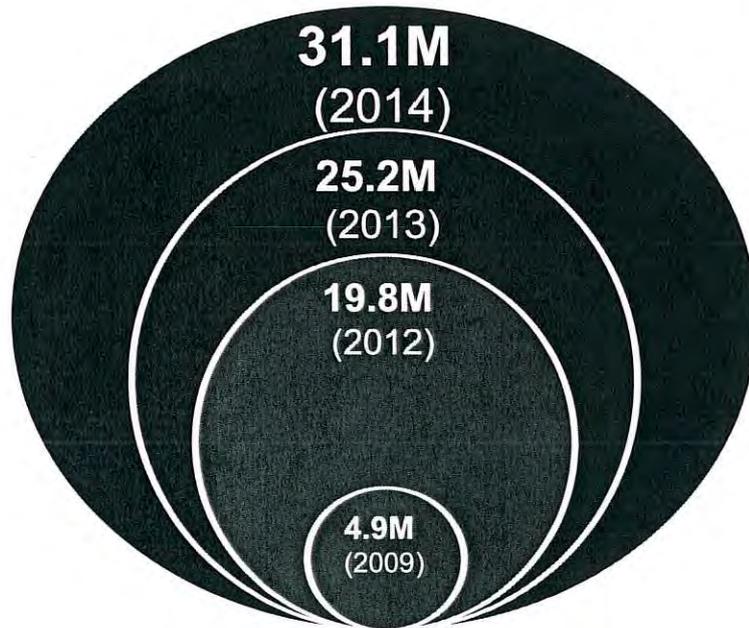
Total agricultural area affected by typhoons, floods and droughts in the Philippines 2000-2010 (hectares)





保險金額

Microinsurance coverage in the Philippines



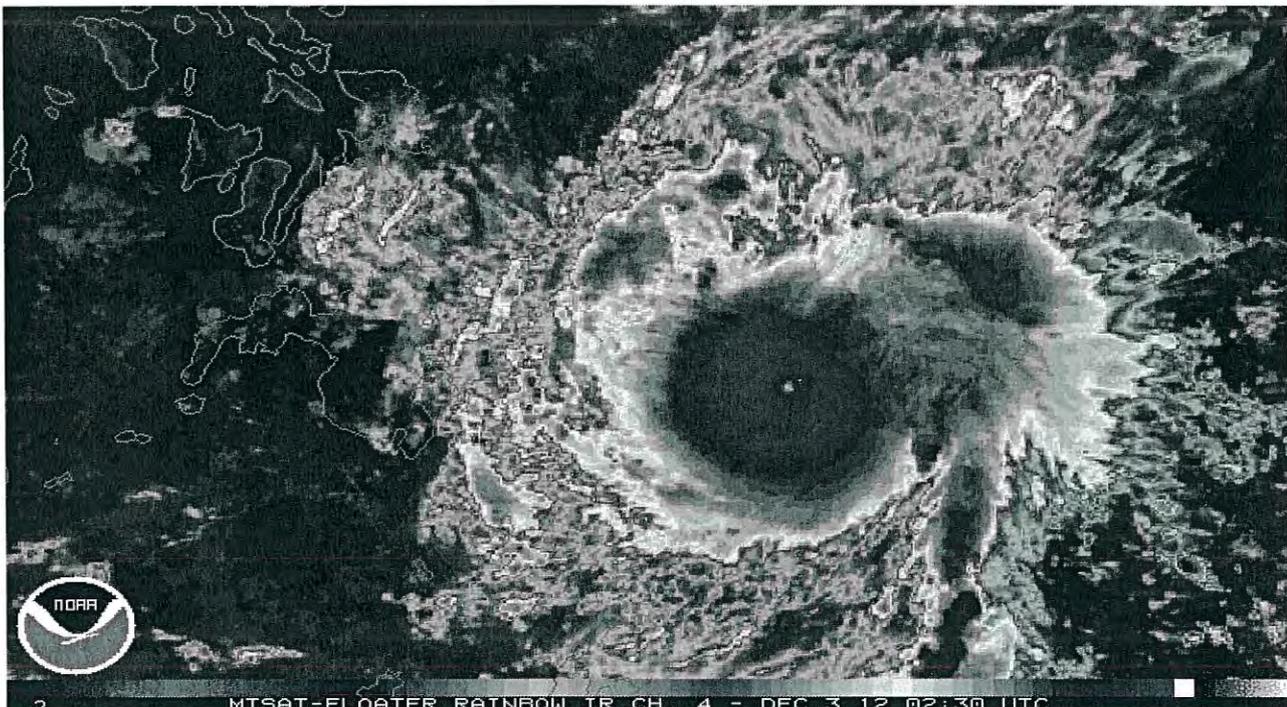
Note: No agricultural insurance offered yet by private sector

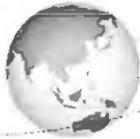
* Data source: Insurance Commission



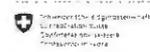
Index Insurance Products available

(e.g. Munich Re Weather Protect: Typhoon Bopha - Pablo)



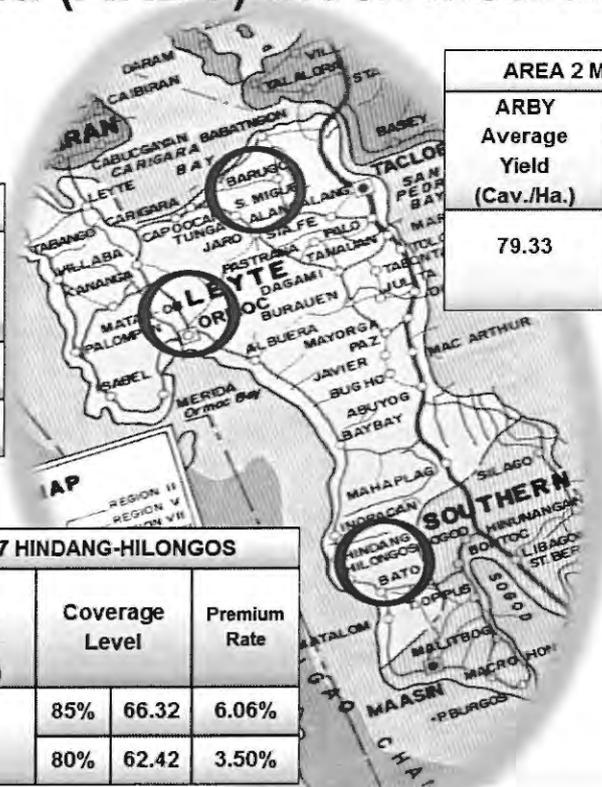


Index Insurance Products already designed (e.g. Area Based Yield Index Insurance for Rice (1))



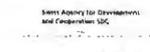
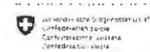
Area Based Yield (ARBY) Index Insurance Triggers

AREA 1 - BAO NIS			
ARBY Average Yield (Cav./Ha.)	Coverage Level		Premium Rate
79.33	85%	67.43	7.12%
	80%	63.47	4.00%



AREA 2 MAINIT-PONGSO NIS			
ARBY Average Yield (Cav./Ha.)	Coverage Level		Premium Rate
79.33	85%	67.43	7.12%
	80%	63.47	4.00%

AREA 7 HINDANG-HILONGOS			
ARBY Average Yield (Cav./Ha.)	Coverage Level		Premium Rate
78.03	85%	66.32	6.06%
	80%	62.42	3.50%





Index Insurance Products already designed

Area Based Yield Index Insurance for Rice (2)

Functionality	Area-yield based insurance that indemnifies every farmer Average yield loss due to flood, drought and pests & diseases (MPCI) at the end of the cropping season.
Sum insured & Coverage level	Sum insured is the loan amount Coverage levels of 70% and 80%
Payout	Payout within 30 days



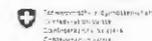
Replanting cover



Early yield forecast pay-out



Post-harvest coverage



Objectives of the MicroAgri Regulatory Framework

(Approved in December 2015)

- 明确

Provide clear-cut policy on MicroAgri to encourage the Government and the private sector Microinsurance (MI) providers to innovate and design products tailor-fitted to the needs of the agricultural clients
- Clarify and delineate the rules and functions of the Government and the MI providers, regular agents, general agents, brokers, and other stakeholders on the development of MicroAgri



MicroAgri Provision and Distribution

- Insurable interest and eligibility to purchase MicroAgri
- The parameters that may be used in constructing proxy loss formulae / indices in parametric-based microinsurance include wind speed (kph), temperature (degrees Celcius), relative humidity (percentage), water levels, rainfall (amount of, in mm), and other similar indexes that may be permitted by the Insurance Commission.
- Area-base yield / average-based yield measurements and methodologies (crop-cutting, remote imagery and others) may also be applied for determining payout values.

15

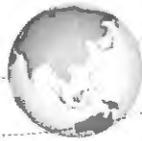


Data sources and access – Product design (1)

- Insurance providers in charge of determining and collecting data needed
- Data for determining the trigger and the payout
- Certified data should come from a reliable entity duly recognized by the government
- Primary source of data shall be clearly stated in the contract
- Contract duration and cover conditions to be clearly defined



16



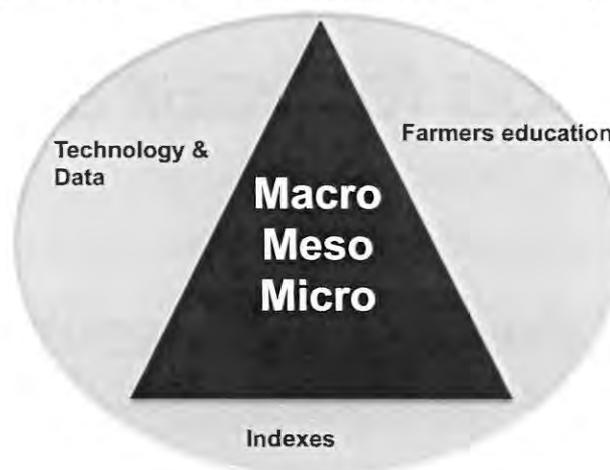
Data sources and access – Product design (2)

- The policy contract should have a fallback methodology in case a primary source data is not available
- Publish data periodically in the website of the insurance provider in a manner that is simple and can be understood by the clients
- The published data in the website of the insurance provider can be easily verified by the clients with the data provider
- Validity of the claim shall be within a period of one year from the date of the certification of the data
- The trigger must be clearly defined and as soon as trigger has been breached within the coverage period, claims shall be payable

17



Integrated Agricultural Insurance Approach



Political Economy of Agri insurance

Public Private institutional arrangements

Digitalization



Looking ahead

Action	Goal
1. Study on loss and damage in agro , market assessment and emerging requirements of agriculture insurance in the Philippines	To document historical loss ratios and market penetrations of various insurance lines, for the identification of feasible business options, for allocation to PCIC and the private insurance sector
2. Full implementation of MicroAgri regulatory framework by key stakeholders such as DA, PCIC, IC, PAGASA etc and the private insurers based on current rich knowledge in agriculture insurance	To seek and build on the strengths of all involved stakeholders and in particular of the private insurers towards expansion of agriculture insurance by complementing services, market focus and redefining roles
2. PCIC and private insurers dialogues on risk sharing based on loss and damage results and assessment of current roles.	Maximize Government subsidy through market segmentation, strategic targeting, and complementary risk management through the private sector



Thank you for your attention

<http://www.inclusiveinsuranceasia.com/docs/MicroAgri-Framework-Philippines.pdf>

www.mefin.org

Antonis.malagardis@giz.de

Big Data and Sustainable Insurance for Agriculture

September, 2016 Singapore

Hang Gao PhD
Guy Carpenter

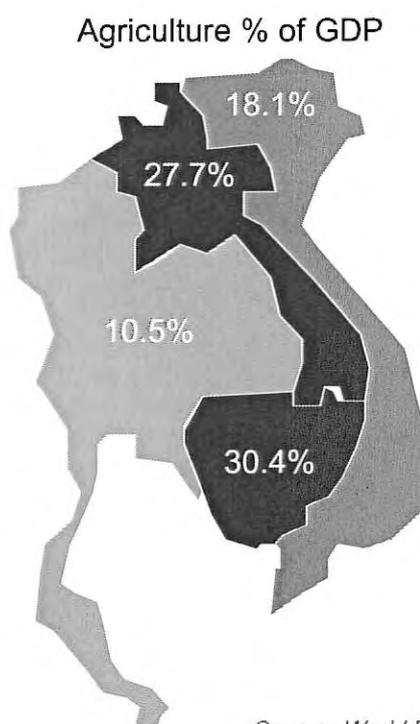
Agenda

- Overview – Characteristics of Agro Insurance
- Development Needs Data Support
- Options & Reanalysis Data
- Case Study – Zhejiang Tea Tree Low Temp Analysis
- Summary

Overview - Characteristic of Agro Insurance

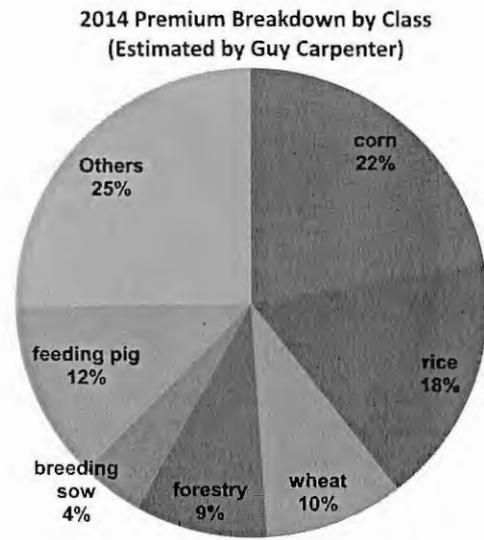
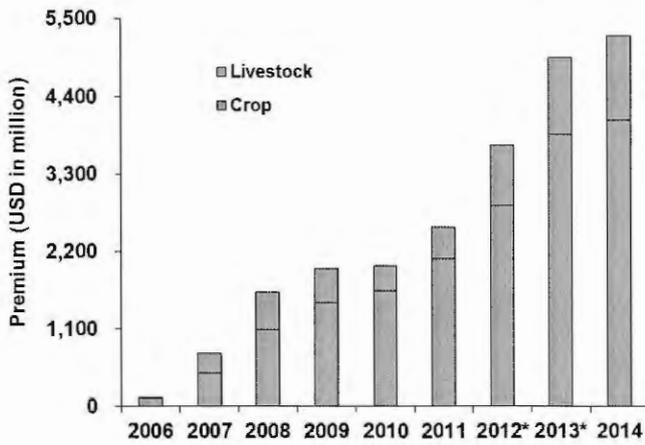
Importance of Agriculture in the Region

- Agriculture contributes significantly to GDP in Asian countries, for an example:
 - Approximately 50% and 75% of the workforce in Vietnam and Laos are in agriculture (including forestry and livestock);
 - 40% of Thailand's population is in agriculture, forestry, and fishing related employment;



Source: World Bank

Rapid Growth In China



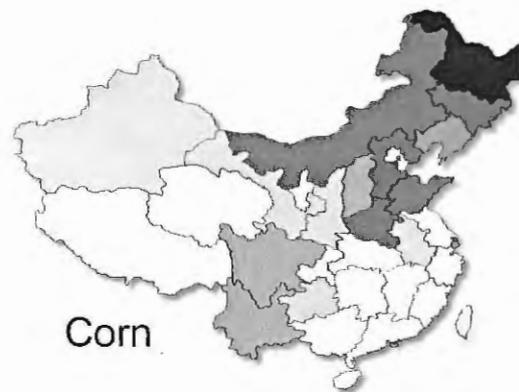
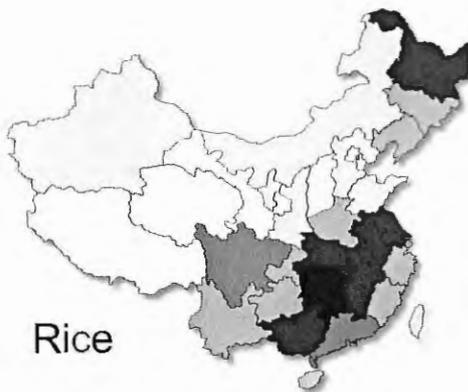
2014 Agriculture premium in China was 5.5 billion USD.

Total non-life premium was approximately 160 billion USD.

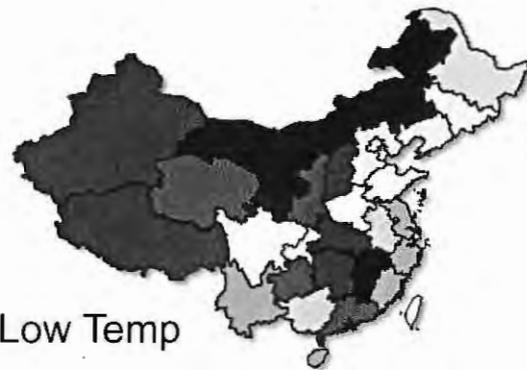
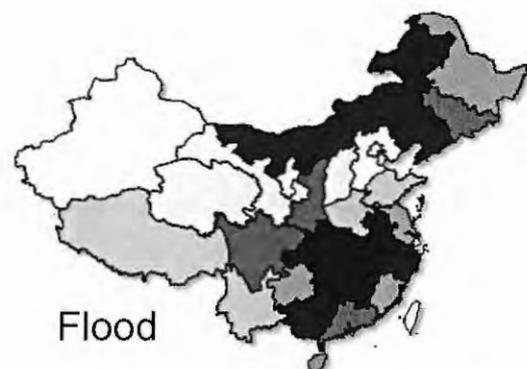
Crop is the dominant class in the Chinese Agriculture Insurance Portfolio, which accounts 77% of total premium in 2014.

The insurance penetration rate of major crop types is 61.6%, while for forestry class the rate has exceeded 85%. On the livestock side, for breeding sow the penetration rate is over 60% and 25% for feeding pig.

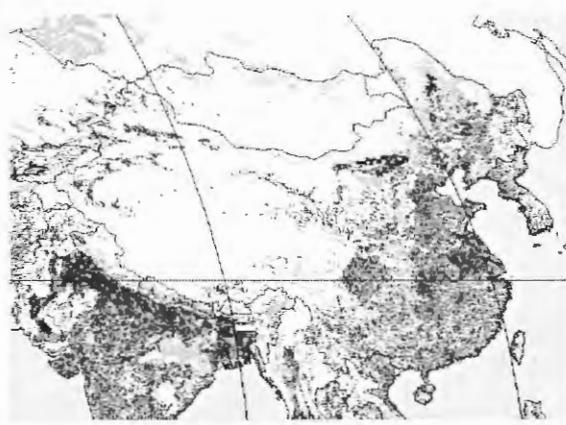
Extensive and Various Spatial Distribution (China Example)



Vulnerable to Various Perils (China Example)



Drought Losses in China



Most of the drought damage is in the north and west where there is very little irrigation.

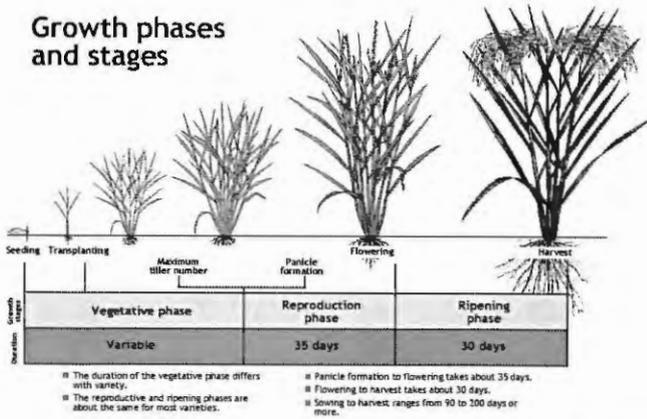
Drought is the major cause of crop losses in China followed by flood.

Area equipped for irrigation in percentage of land area

0	10 - 20
< 0.1	20 - 35
0.1 - 1	35 - 50
1 - 5	50 - 75
5 - 10	75 - 100

Sensitive To Timing (Seasonal)

Growth phases and stages

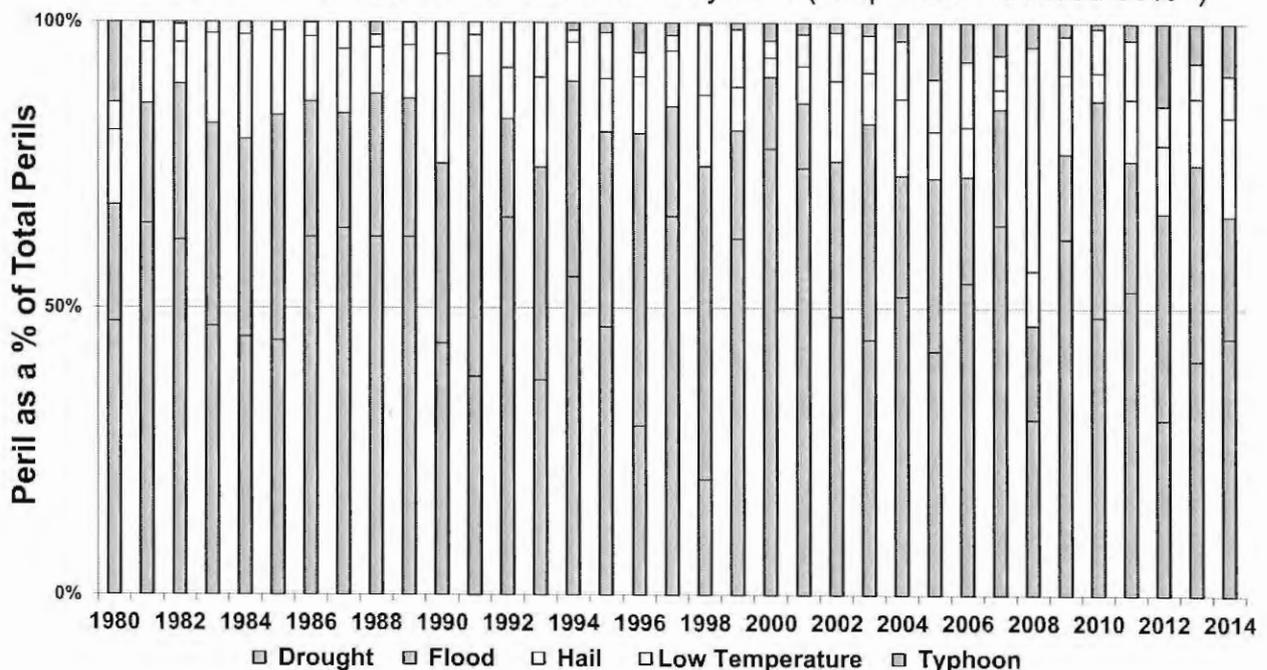


- Different from other line of business, agro insurance is particularly sensitive to timing;
- Growing season is different by region by crop type by growth stage;

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
China	Early crop												
	Interm crop												
	Late crop												
Japan													
India	Kharif												
	Rabi												
Thailand	Main season												
	Second season												

Sensitive To Timing (Annual)

Disaster Stricken Area Breakdown by Peril (Crop Yield Reduced 30%+)



Source: China Agricultural Yearbook

Section 2

Data Is Critical

10

Surface Based Observation Data

- Surface weather observations are the fundamental data used for weather forecasting and climate research worldwide.
- They can be taken manually, by a weather observer, by computer through the use of automated weather stations (AWS), or in a hybrid scheme using weather observers to augment the otherwise automated weather station.

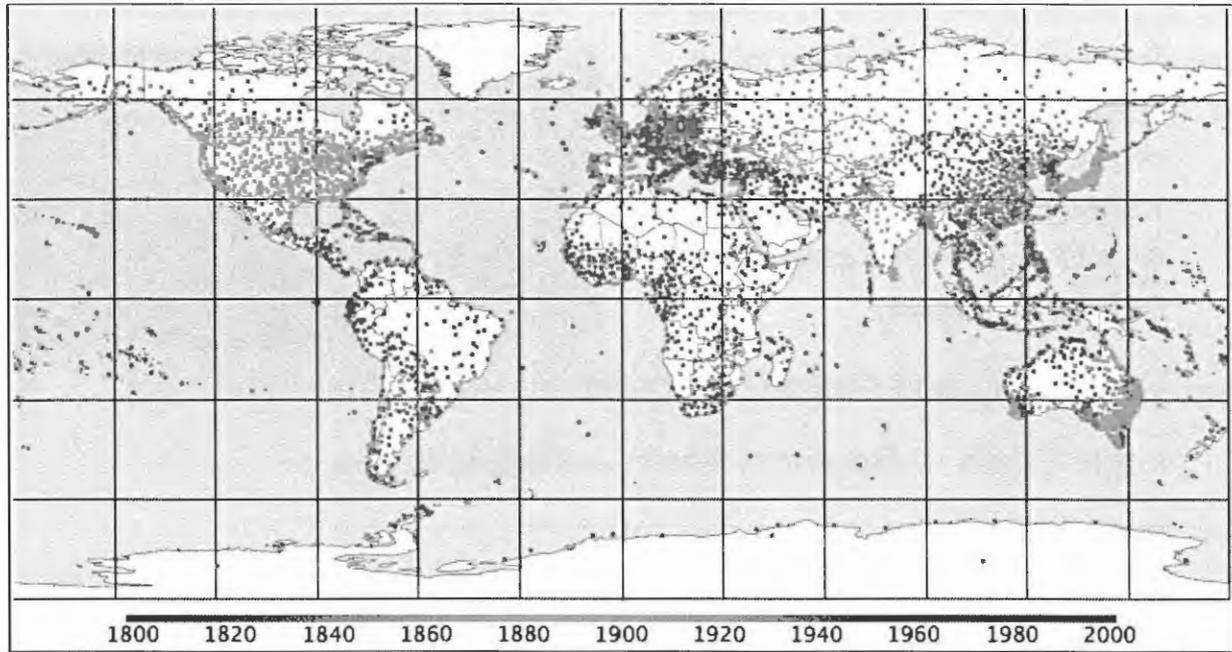


source: Oxford Univ.



source: Cornell Univ.

Time of Surface Stations Joining into a Global Network

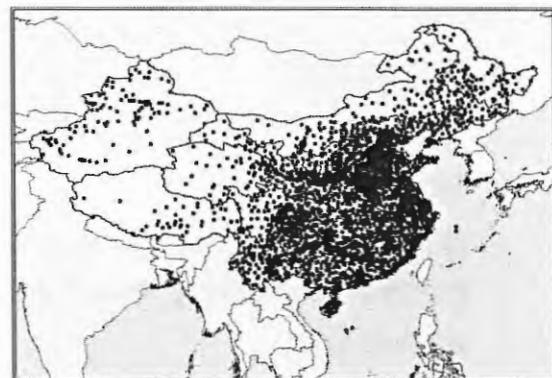


Source: WMO

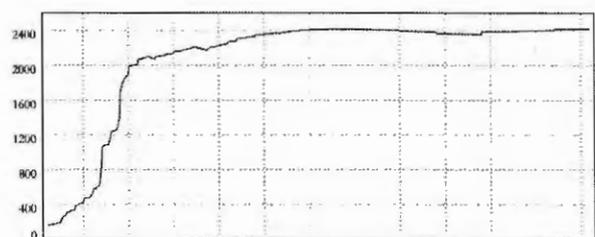
Modern meteorological observation started from Europe then spread to other places gradually. In Asia, the majority of modern surface observations started from the last 100 years or even more recent for historical reasons.

Pro-Con Analysis

- **Pros:**
 - Accurate
- **Cons:**
 - Sparse location; limited spatial coverage;
 - Data length may be limited;
 - Because of manual operation, there may be omission and errors;
 - Difficult to access;
 - Expensive;



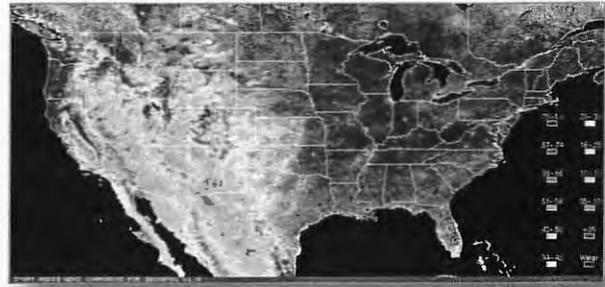
national standard surface stations in China (Source: CMA)



number of surface stations along time (Source: CMA)

Remote Sensing Data – Crop Monitoring

- Increasing availability of remote sensing data enables real-time crop vegetation index monitoring via spectral analysis or high resolution satellite images;



Source: NASA

- Classifying and mapping vegetation; Vegetation Index (VI);
- Local Scale -> Regional Scale -> Global Scale;
- Instruments:
 - Advanced Very High Resolution Radiometer (AVHRR), 1981 ~
 - Moderate Resolution Imaging Spectroradiometer (MODIS), 1999 ~
 - Visible Infrared Imaging Radiometer Suite (VIIRS), 2011 ~

Pro-Con Analysis

- Pros:
 - Accessible;
 - Extensive spatial coverage;
 - Up-to-date;
 - Mature products: crop growing, pasture, wild fire, even drought and snow;
- Cons:
 - Accuracy depends on algorithm;
 - Satellite data is mainly about 'exposure' rather than 'perils'; there is no data for temperature, wind, etc. which are essential for assessing agro risks;



DigitalGlobe



CROPIO



ASTRIUM
AN EADS COMPANY

USGS
science for a changing world

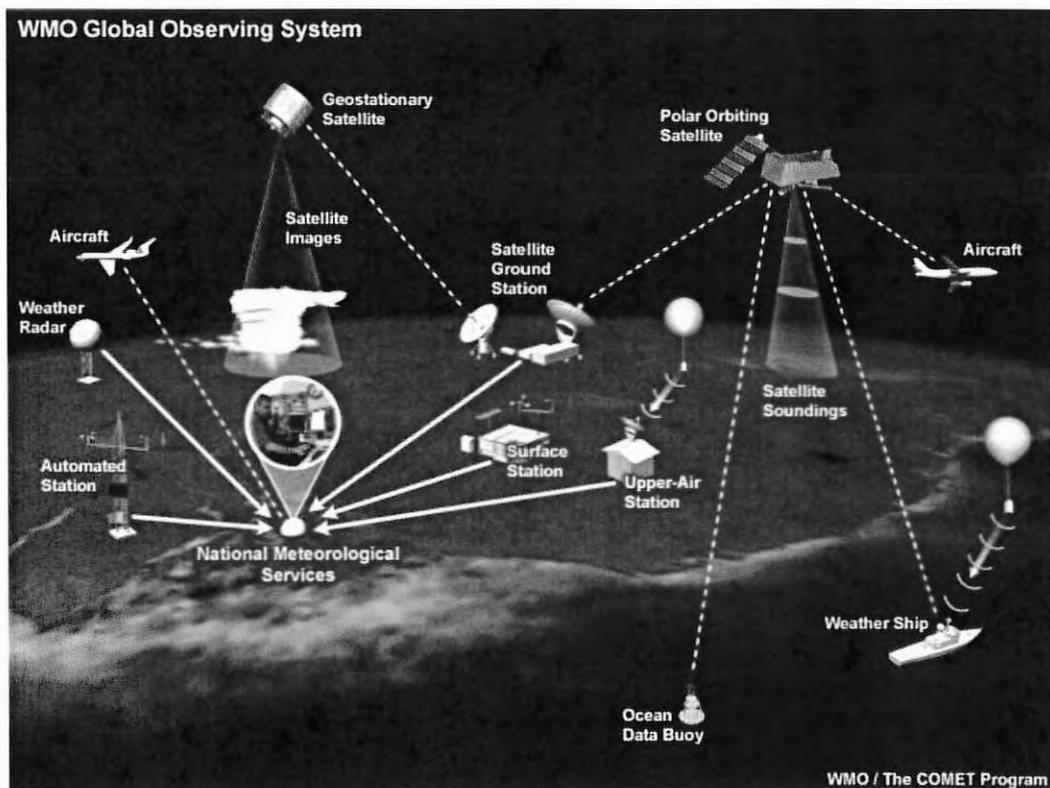
GEOSYS
Growing agriculture

gmv
INNOVATING SOLUTIONS

Section 3

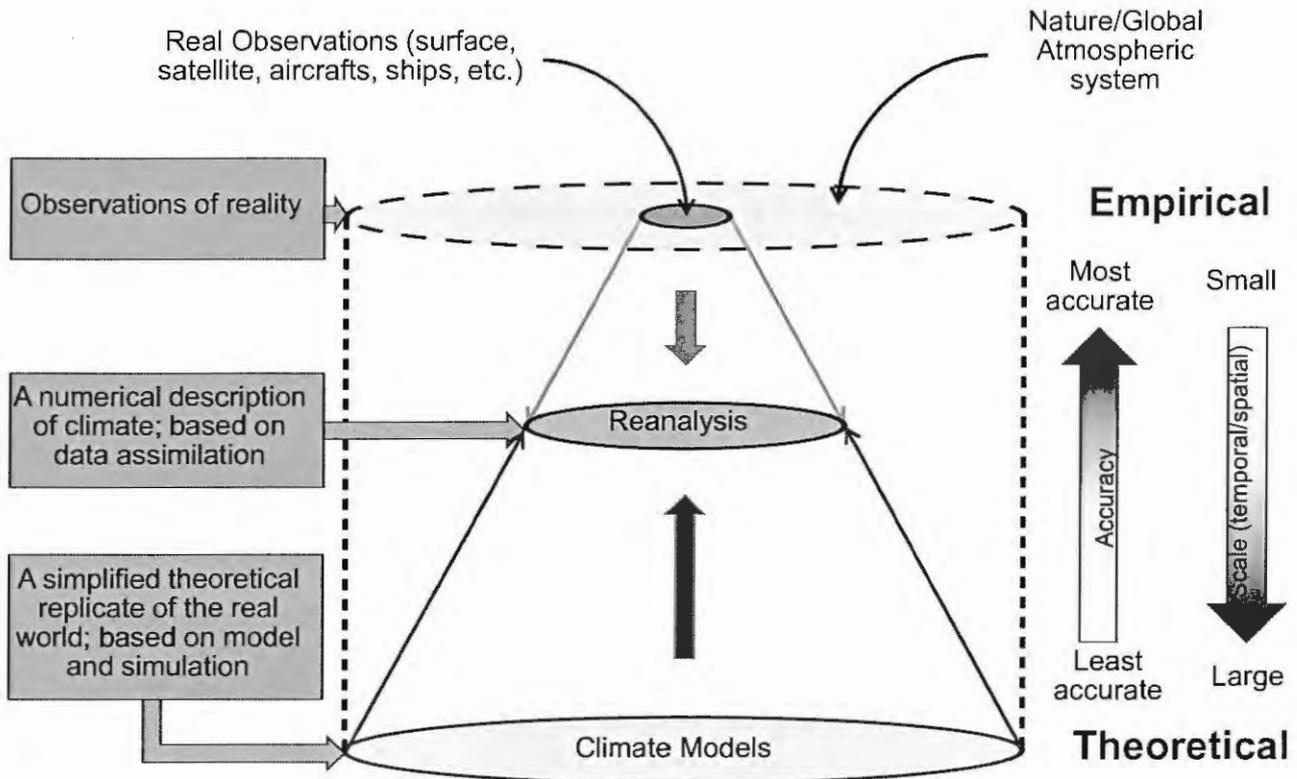
Options & Reanalysis Data

Existing Global Observing System



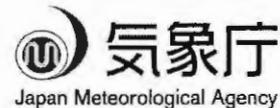
Source: WMO

Reanalysis Data Is A Further Step From Existing Observations



Development and Evolution

- ECMWF Interim Reanalysis (ERA Interim)
- Japanese 55-year Reanalysis (JRA-55)
- NASA MERRA
- NCEP/NCAR Reanalysis I (R1)
- NCEP Climate Forecast System Reanalysis (CFSR)
- NOAA-CIRES 20th Century Reanalysis (20CR)
- ASR (Arctic System Reanalysis)



ECMWF and ERA Reanalysis Data

- The European Centre for Medium-Range Weather Forecasts (ECMWF) is an independent intergovernmental organization supported by 34 states.
- The organization was established in 1975 and now employs around 300 staff from more than 30 countries.
- ERA-Interim is a global atmospheric reanalysis:
 - From 1979, continuously updated in real time;
 - Resolution up to 0.125 x 0.125 degree (interpolated);
 - Comprehensive weather parameter coverage;
 - Predecessor: ERA-15, ERA-40

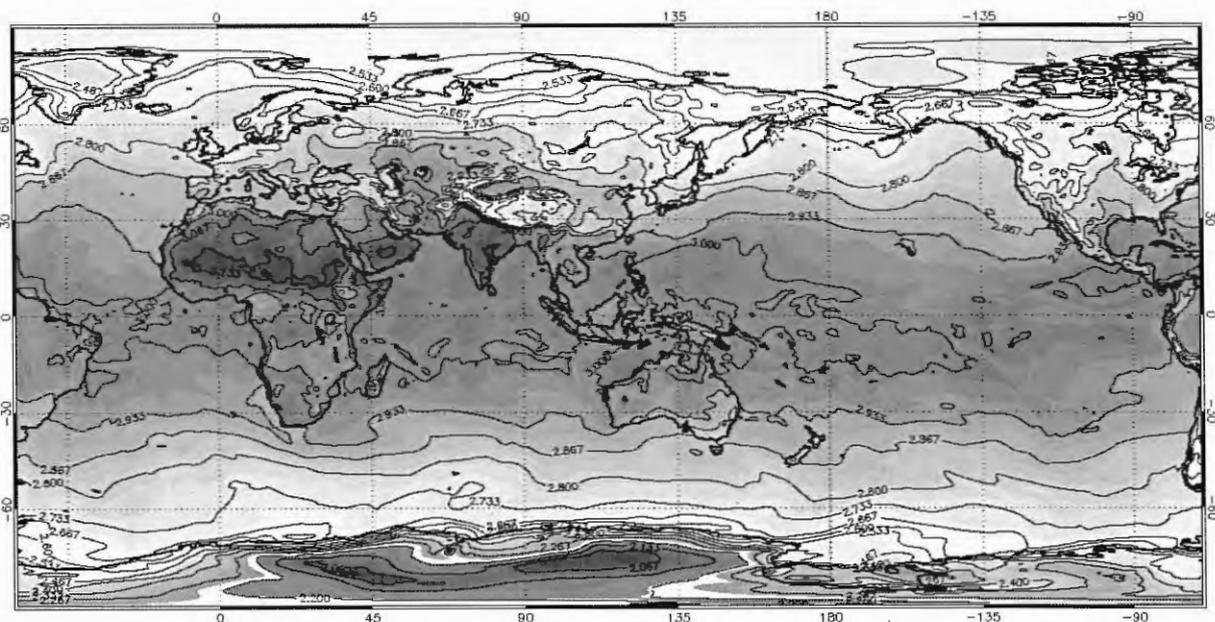


Source: ECMWF

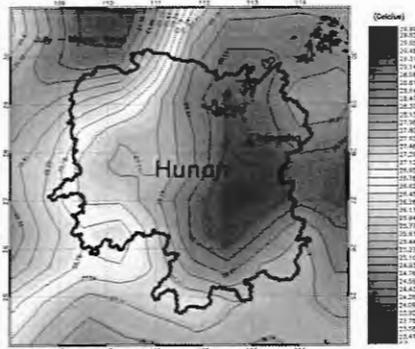


Source: ECMWF

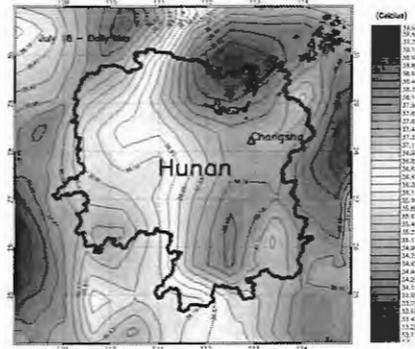
Example 1: Global Coverage On A Given Time Point



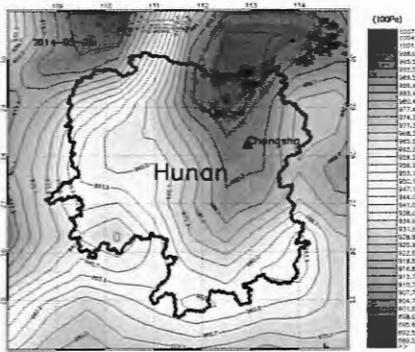
Example 2: Regional Coverage At Different Settings



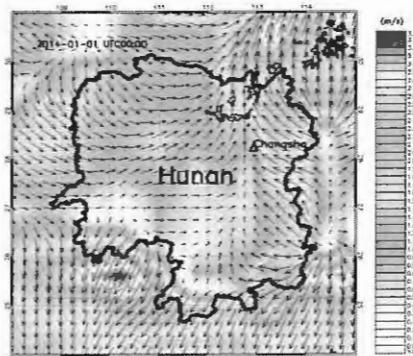
Monthly Mean 2-meter Temperature for July over 1979 - 2014



Daily Max temperature on July 18 over 1979 - 2014



Daily Mean Pressure on May25 2014



Windfield at UTC00 on Jan01 2014

Pro-Con Analysis

- Pros:
 - Global coverage
 - Consistent spatial and temporal resolution
 - Accessible
- Cons:
 - Bias introduced by models, observations as well as assimilation methodologies
 - Coarse resolution
 - Inaccurate therefore appropriate care is needed



Section 4

A Case Study – China Tea Tree Low Temp Risk

24

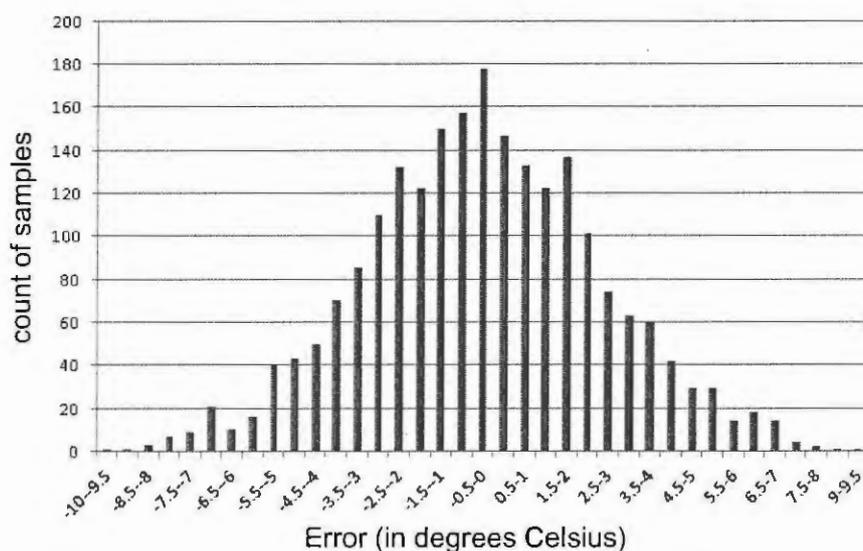
Background

- Background:
 - A Chinese insurer launched an innovative tea leaves low temp products;
- Objective:
 - Calculate occurrence probability of low temperature condition in Zhejiang province in March;
- Issue:
 - CMA daily minimum temperature is available for only one surface station in the whole province
- Solutions:
 - ERA-Interim data, 1979-present, daily minimum 2-m temperature



Analysis – Comparison Between ERA-I and CMA at CMA Station

- In term of daily variation, ERA correlates with CMA data well;
- However, discrepancies exist between two types of data;
- Error = [ERA-I Data] minus [CMA Observation Data] for each day over the overlapping observation period of time;

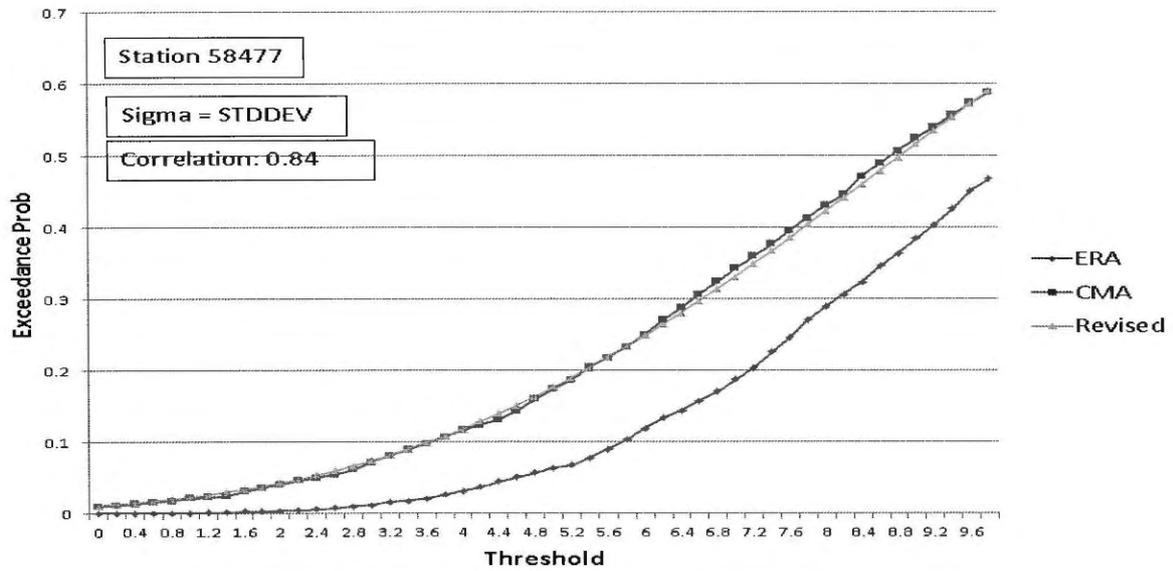


X-axis is error bands, Y-axis is count of number falling into the band

A Possible Solution – Conditional Probability

- **Objective:** To inter exceedance probability exceeding certain temperature threshold from ERA-Interim data;
- **Assumption:** Error between ERA-I and surface station temperature can be described by a normal distribution;
- $P(t) = \sum_{i=1}^n P(ERA > [t + Error.i]) * P(Error.i)$; where
 - $P(t)$: exceedance probability exceeding given threshold (t);
 - t : temperature threshold in Celsius;
 - $Error.i$: the i -th Error band, [ERA-I] minus [CMA Surface Observation];
 - $P(Error.i)$: Probability of the i -th Error band, described by a normal distribution;
 - $P(ERA > [t + Error.i])$: Probability for ERA data exceeding threshold plus the i -th Error band;
- Normal Distribution's parameters are calculated from the given station's data: **Mean: 1.331394; Standard Deviation: 2.145**

A Possible Solution – Conditional Probability



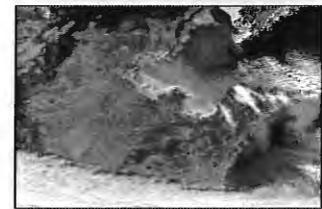
In the studied product, low temp is defined as 0.5 Celsius; exceedance probability is as below

Prob [ERA-I]	Prob [CMA]	After Adjustment
0.091%	1.458%	1.449%

Section 5 Summary

Summary

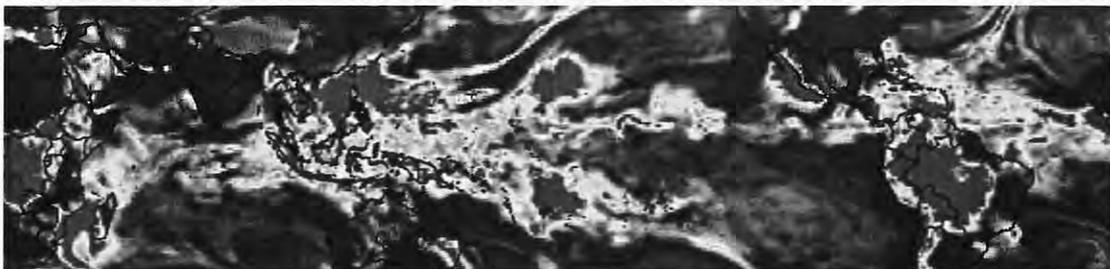
- **Agro Insurance's characteristics:**
 - Extensive, uniform geographical coverage; (spatial)
 - Particularly sensitive to timing; (temporal)
 - Vulnerable to various types of perils; (vulnerable)
- **Agro Insurance's developments request big data support:**
 - Surface observation data
 - Accurate but less accessible;
 - Spatial and temporal limitations;
 - Remote sensing data
 - Accessible; Reasonable accuracy;
 - Mainly about exposure rather than perils;



Source: Internet Sourced Images

Summary

- **Reanalysis Data**
 - Essentially a numerical description of global climate, basing on a hybrid of climate models and real observations from various sources;
 - Enjoys consistent spatial and temporal resolution;
 - Accessible; comprehensive weather parameters;
 - Bias and inaccuracy requests cautions in applications;



Source: ECMWF

About Guy Carpenter

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32



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Risk Management Solutions for Agriculture Corporates

Jeffrey Khoo VP Food & Agriculture Business



General Public Release

Table of Contents / Agenda

- Introduction and overview
- Types of Parametric Agriculture Insurance Solutions
 - Weather Index Solution
 - Area Yield Index Solution
 - NDVI and Satellite Solutions
 - Cat-in-a-box

Introduction and overview

Swiss Re at a Glance

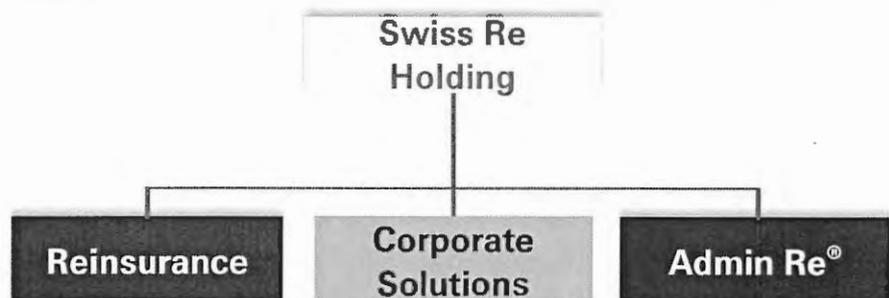


Swiss Re is a **leading and highly diversified global re/insurer**, founded in Zurich (Switzerland) in 1863

Swiss Re has credit rating of **AA-** by Standard & Poor's, **Aa3** by Moody's and **A+** by A.M. Best



These traditional reinsurance products are complemented by **Swiss Re Corporate Solutions'** global insurance capabilities for large corporate risks

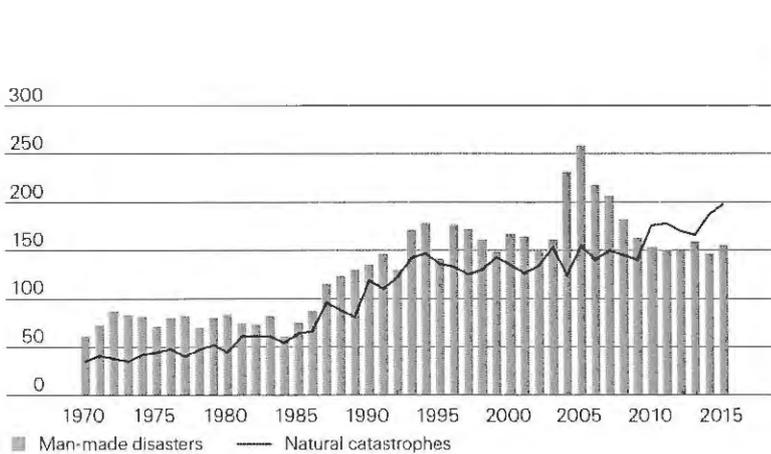


Risks are multiplied along the agriculture supply chain can affect many players

Insurance provides protection and credit enhancement in the value chain



Record number of NATCAT events in 2015



Source: Swiss Re Economic Research & Consulting and Cat Perils.

-  2009 Argentina – Drought
Soybeans – 35% Crop Shortfall
-  2010 Russia – Drought –
Grains 40% Crop Shortfall
-  2010 Australia – Floods, Drought
Grains – 40% Crop Shortfall
-  2011 Mexico – Drought
Corn – 30-40% Crop Shortfall
-  2012 USA – Drought (MW)
Corn, Soybeans – 20% Crop Shortfall
-  2014 Thailand – Flooding (N.E.)
Rice – 14 -20% Crop Shortfall

Parametric Based Solutions: Advantages and Challenges

Advantages:

- Transparent
- Less disputes
- No Adjustor involved
- Light administration
- Rapid payout
- Alternative product in case no other reliable data available

Challenges:

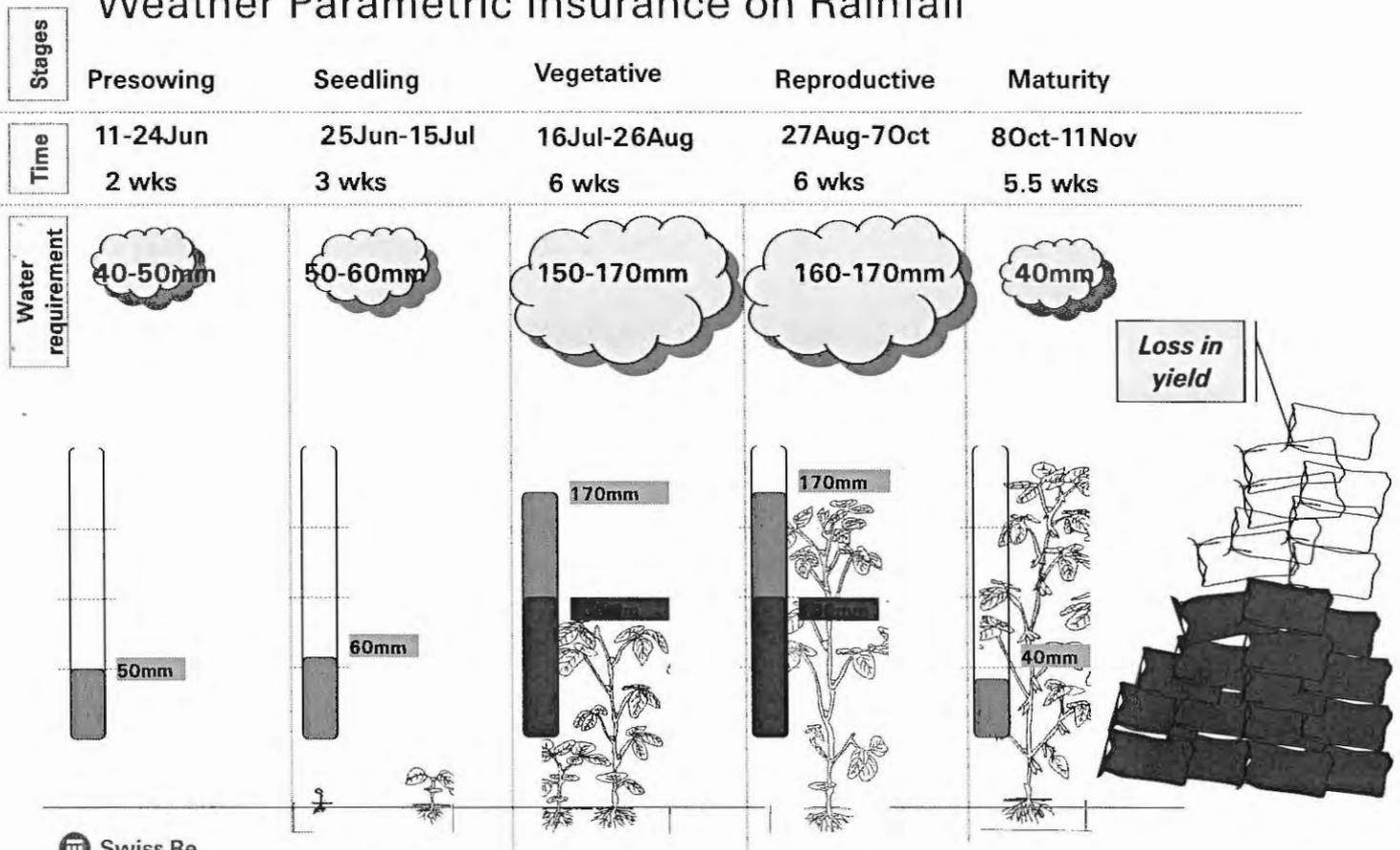
- Basis risk (i.e. difference between the payout and the actual losses)
- Understanding of the index

Types of Parametric Agriculture Insurance Solutions

- Weather Index Solution
- Area Yield Index Solution
- NDVI and Satellite Solution
- Cat-in-a Box Solution

Weather Index Solution

Weather Parametric Insurance on Rainfall



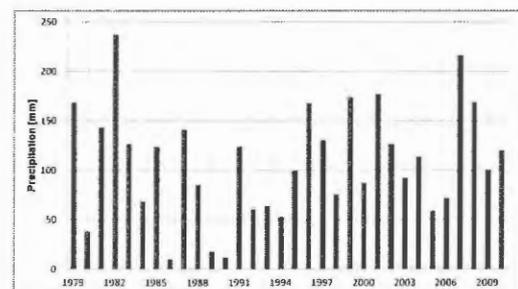
Weather Parametric Insurance

- Underlying: Rainfall / Temperature / Wind speed/ Drought/ Humidity/ Sunshine Hours.
- Index is developed on the basis of requirements of the crop at different stage(s)
- Data source : Neutral 3rd party / Govt. managed weather station(s)
- Structuring can be done either on Excess or on Shortfall
- Settlement is done within 30 days of the expiry of the policy

Contract period	• Which Risk period is covered by the contract?
Limit	• Maximum Payout of contract (e.g. USD 10,000'000)
Strike/Trigger	• At which level shall payout start (e.g. below 125mm)?
Exit	• At which level shall payout be maximized (e.g. 25mm)?
Tick	• What is the payout rate (e.g. USD100,000/mm)?

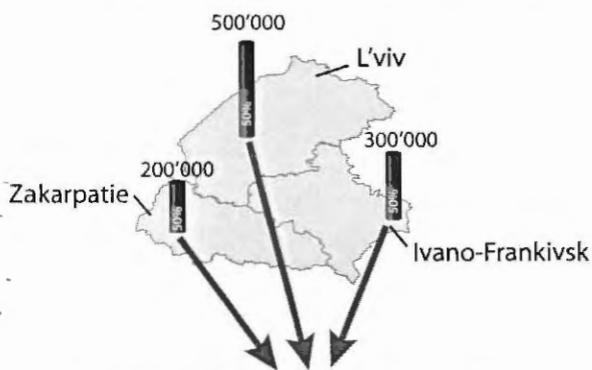
Example: Deficit rainfall index

- **Payout Calculation Limit = USD 10,000,000**
- **Strike = 125 mm**
- **Exit = 25 mm**
- **Tick = USD 10,000,000 / (125-25) = 100,000 USD /mm**
- **Actual Rainfall: 50mm**
- **Formula: Payout = min(max(Strike - Index,0)*Tick,Limit)**
- **Payout = (125mm-50mm) X USD10,000 = 7,500,000 USD**



Area Yield Index Solution

Processing/Silo crop shortfall cover - Utilizing Government Reported Yield Data as an Index



Crushing Company Ltd

- Sunflower seed crushing in Ukraine

- **Expected Area Production: 1,000,000 mt**

- Expected Production: 500,000 mt

- Market Share: 50%

- Crushing Margin: 50 USD/mt

- Total Margin: USD 25 million

- **Actual Area Production: 500,000 mt**

- Production based on 50% MS: 250,000 mt

- Crushing Shortfall: 250,000 mt

- **Crushing Margin Loss: USD 12.5 million**



Legend:
Sunflower production

Market production
Client's Market Share

NDVI and Satellite Solutions

Satellite-based index cover

- Satellite-based vegetation index
- Normalised Difference Vegetation Index (NDVI)
- Payout: loss calculated by Drought/Flood / Fire index based on vegetation state and grid (eg 5 x 5 km) with aggregation over entire area
- Yield data required to lower Basis Risk (Improved correlation)



Source: SwissRe Corso ECM

Thank you



General Public Release



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This panel will look at the changing risk landscape of the farming community in Asia and how risk modelling can boost the agriculture sector's resilience:

- How Agriculture Risk Modelling Has Evolved to Meet Needs of the Rapidly Changing Risk Environment
- Challenges of Modelling Agriculture Risks in Emerging Markets
- Case Studies on Innovative Risks Modelling

Moderator: Sonu Agrawal, *Managing Director, Weather Risk Management Services, India*

Panellists include:

- Salah Dhouib, Class Underwriter – Agriculture, Liberty Specialty Markets, France
- Prof Shie-Yui Liong, Deputy Director, Tropical Marine Science Institute, National University of Singapore
- Rachael Wallington, Senior Underwriter, International Reinsurance, MS Amlin Asia Pacific, Singapore
- Andrea Shi, Vice President, Agricultural, The Toa Reinsurance Company of America, USA
- Dr Mohan Sharma, Risk Consultant, AgRisk Limited, Singapore

Note: Interactive Q&A session

Key factors for sustainable agriculture insurance systems

Peter Book
Allianz Re, Singapore

Allianz 

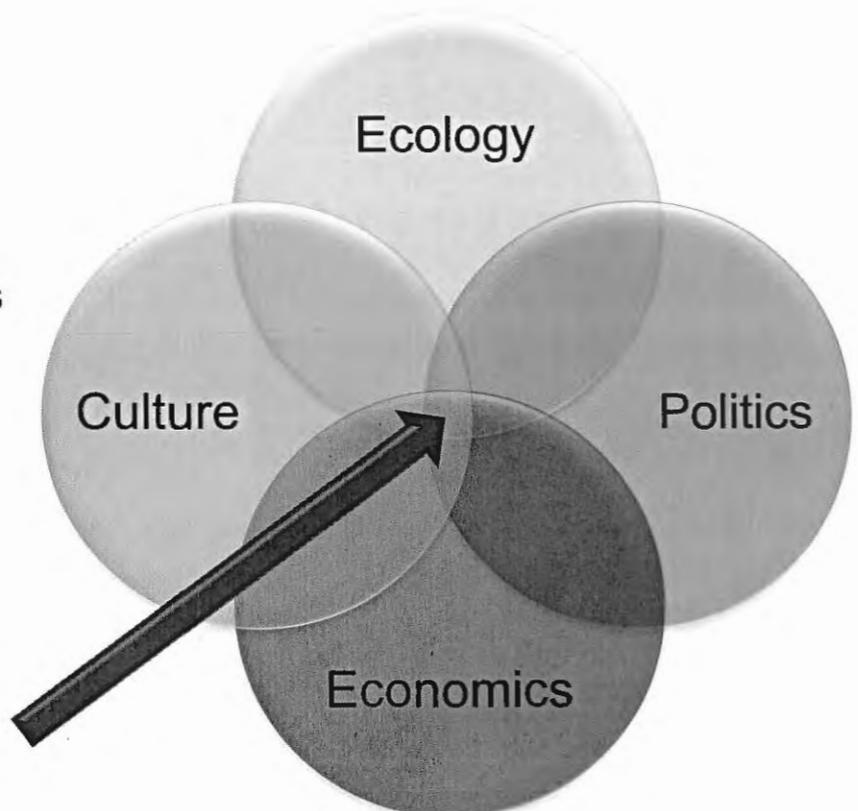
Allianz 

What do we mean by sustainable

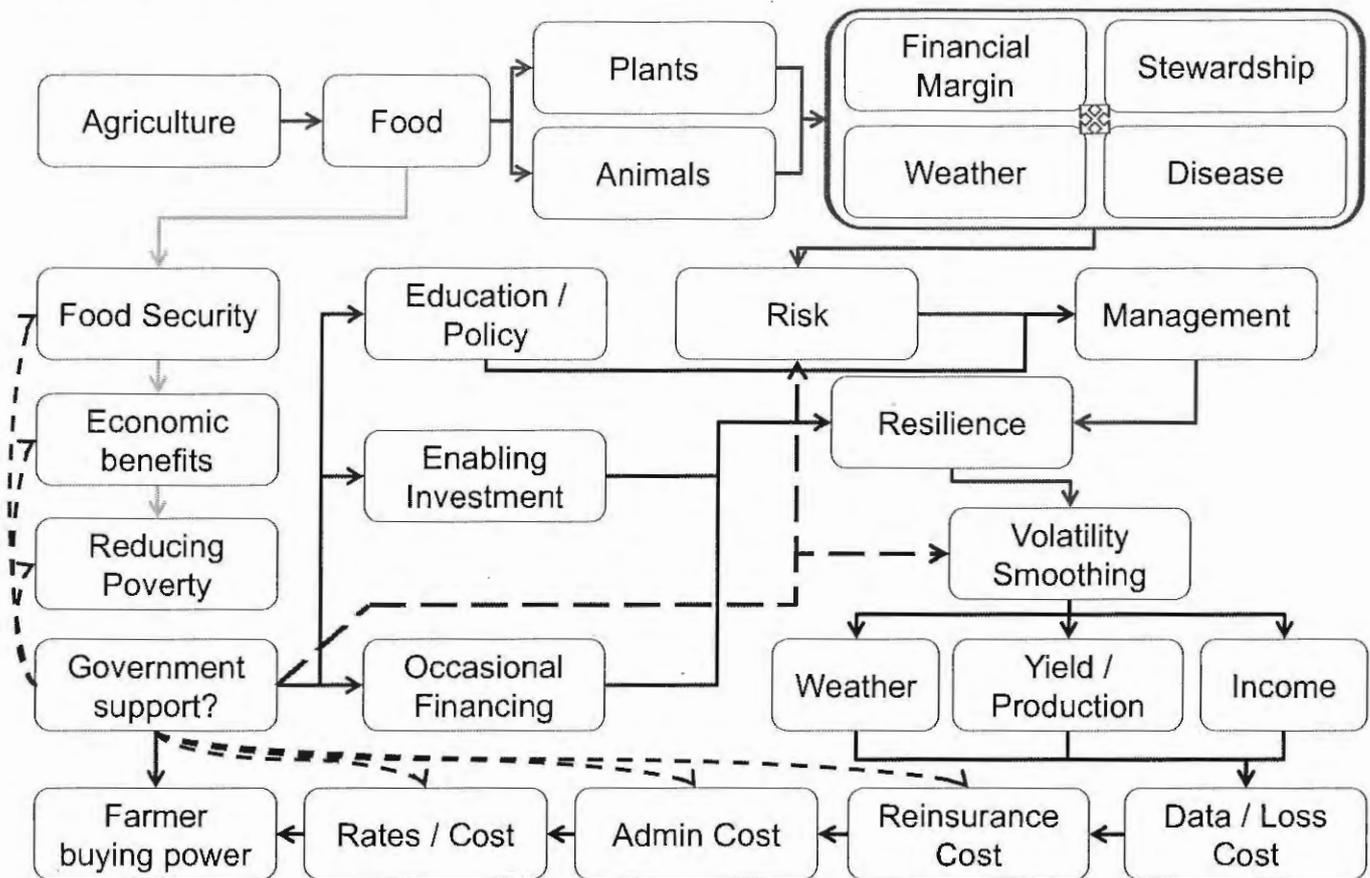
* Sustainability: the endurance of systems and processes.

The organizing principle for sustainability is sustainable development, which includes the four interconnected domains:

- Ecology,
- Economics,
- Politics, and
- Culture.



Agriculture – a system?



Pre vs Post event funding or response

Form	Pro's	Con's
Non-qualifying post event funding	Easy to target localised losses with cash injection	Delay in payments, leakage of funds, fiscal cash flow impact
	No impact on gov't forward estimates	Encourages excessive risk taking and inappropriate production
Pre-event funding	Promote risk aware decisions, reduce investment uncertainty	Diversion of funds within budget
	Low level of crisis management	Reduced political mileage
Qualified post-event funding	Risk sharing between consumer and gov't	Budgeted & non-budgeted expense
	Leverage off existing admin network	Requires strong discipline in distribution of funds
	Freedom of choice for participants	Interaction between private sector and gov't

Level of subsidisation

Country	Agriculture as % of GDP		Rural Population as % of total		Agriculture support as % GDP	Insurance as a % of agriculture support	Agriculture Insurance support as % of GDP
	1970	2012	1970	2012			
India	41	18.2	80.2	68.4	3.1%	0.3%	0.009%
China	35.2	9.53	82.6	48.1	3.2%	1.6%	0.051%
USA	2.3	1.24	26.4	18.9	0.4%	10.15%	0.041%
Canada	≈5.0	1.76	24.3	18.7	0.4%	22.51%	0.090%
Indonesia	44.9	13.3	82.9	48.5	4.6%	0.06%	0.003%
Vietnam	40.2	17	81.7	68.3	0.5%	1.11%	0.006%

Sources: OECD Agricultural Policy Monitoring & Evaluation 2016, World Bank and Allianz Re own analysis

Excessive rate smoothing

Example is Thailand National Disaster Scheme for Rice.

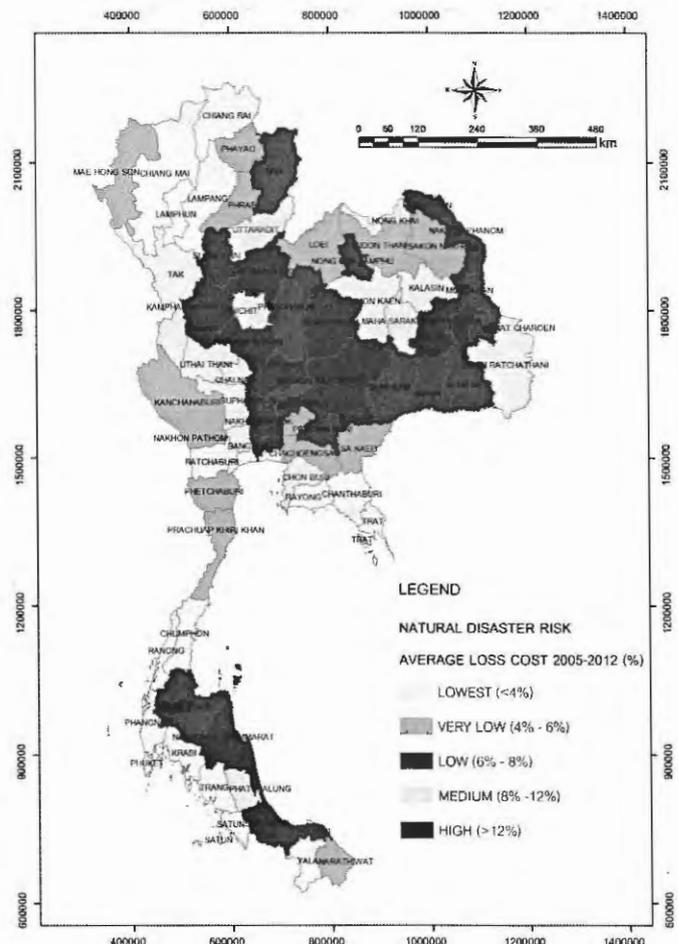
- Average loss cost for lowest zone is 2.91%
- Average loss cost for highest zone is 15.63%

Despite wide variance in risk zones parallel insurance program is flat rated across country

Creates dis-incentive for farmers in low risk zones and encourages take-up in high risk zones – antiselection

Saving factor in 2016 is that insurance for loanees is free (quasi compulsory).

If not compulsory program would become unbalanced and unsustainable



When too much coverage istoo much

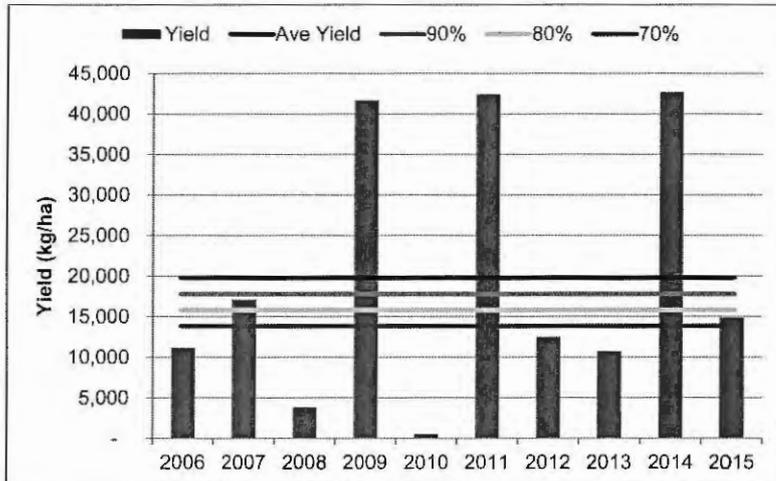
High coverage levels circa 90% of average yield are creating high loss costs – *every player wins a prize!!!*



Results in either:

- Massive subsidy levels required to support the expense, and or
- Very low sums insured to cap the subsidy spend

Question: is the data real and how much coverage is really required?



Coverage	Pure Loss Cost	Retail Rate*
90%	16.47%	31.59%
80%	12.47%	23.91%
70%	8.99%	17.24%

Example is Guar (cluster bean/gum) in a district in Rajasthan, India.

* Retail rate based on Allianz Re estimation

Rate adequacy & rate build ups

- Simple burn and discretionary loadings are not adequate
- Rate it assuming you have no proportional reinsurance
- Understand inherent volatility in class:
 - Aggregate yield with rate $\approx 10\%$, likely to have PML $\approx 400\%$
 - Forestry with rate $\approx 1\%$, likely to have PML $\approx 1,000\%$
- If data set not showing these PMLs then load accordingly
- Review recurrence interval of extreme weather to guide CAT assumptions
- Start with long term sustainable pricing

Factor	Loading
Pure Loss Cost from data set	Multiply sequentially as follows:
Length of data	<10 years X 1.1 < 6 years X 1.2
Proportion of empirical vs "filled" data	< 75% empirical X 1.2 < 50% empirical X 1.4
Extent of data gaps	1% to 15% years X 1.2 16% to 25% years X 1.4 > 25% years = decline
Spatial unit difference between rating and loss trigger	One unit X 1.2 Two units x 1.4 > Two units = decline
Volatility / Data uncertainty	((50% x Coefficient of Variation for Pure Loss Cost) x Standard Deviation of Pure Loss Cost)
Cat loading	Subject to length of data but assume X 1.2
Non-rated perils (not in loss cost data set)	Subject to coverage but will always increase
Loss adjustment expense	If recoverable under RI load rates
Seasonal forecast	Adjust for seasonal expectations
Underwriting margin	Load for agreed underwriting margin, assume X 1.15
Acquisition costs/ceding commission	Load for required deductions

Skin in the game – if you don't believe why would we?

Reinsurance = solvency relief and shock loss protection

Reinsurance ≠ arbitrage

Simple guiding principles:

- 1) If you don't understand it, don't write it.
- 2) Ceding commission ≈ acquisition costs/UW profit
- 3) Insurer & reinsurer should have no less than a common pain point on proportional reinsurance
- 4) Cheapest is not always best
- 5) The costliest reinsurance will be the reinsurance you didn't have when you needed it!

	Option / Offer:	A	B
Retention	A)	15.00%	15.00%
Ceding commission	B)	15.00%	7.00%
Acquisition Costs	C)	3.00%	3.00%
Head Office Costs	D)	3.00%	3.00%
Stop Loss Rate (on Retention)	E) 10.00%		
Stop Loss Cost (as % of 100%)	F) E x H	1.50%	1.50%
Total Costs	G) C + D + F	7.50%	7.50%
Cession	H) 1 - A	85.00%	85.00%
Average commission	I) B x H	12.75%	5.95%
Margin	J) B - G	5.25%	-1.55%
Income	K) A + J	20.25%	13.45%
Loss trigger to cedent	L) K ÷ A	135.0%	89.67%

Basis Risk in index insurance – works both ways!



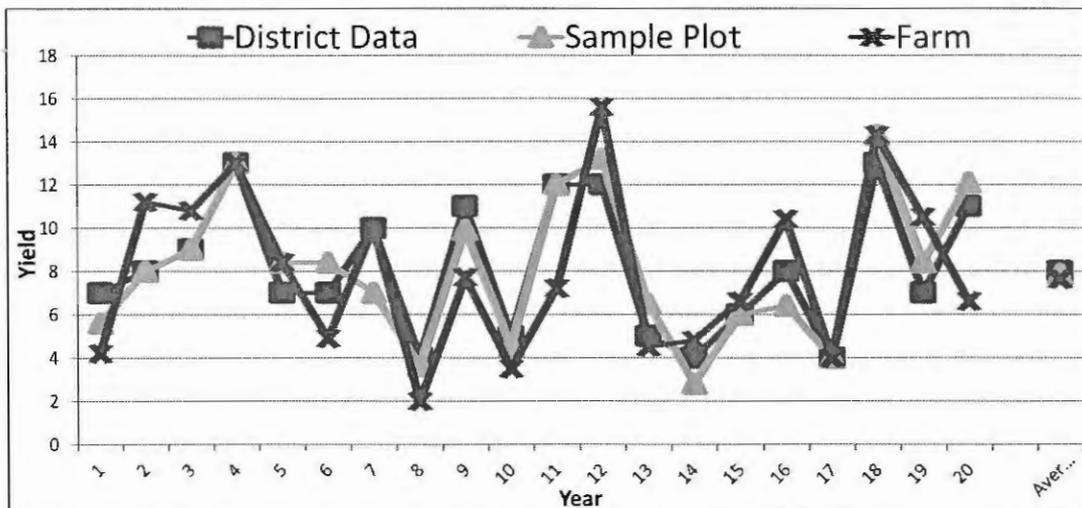
Historical yield data at District level – drives loss cost & rates



Current season indemnity yield data at Village level – drives loss settlement



Actual loss occurs at farm level – drives farmers income & livelihood



Loss Cost at 80% coverage

District 6.38%

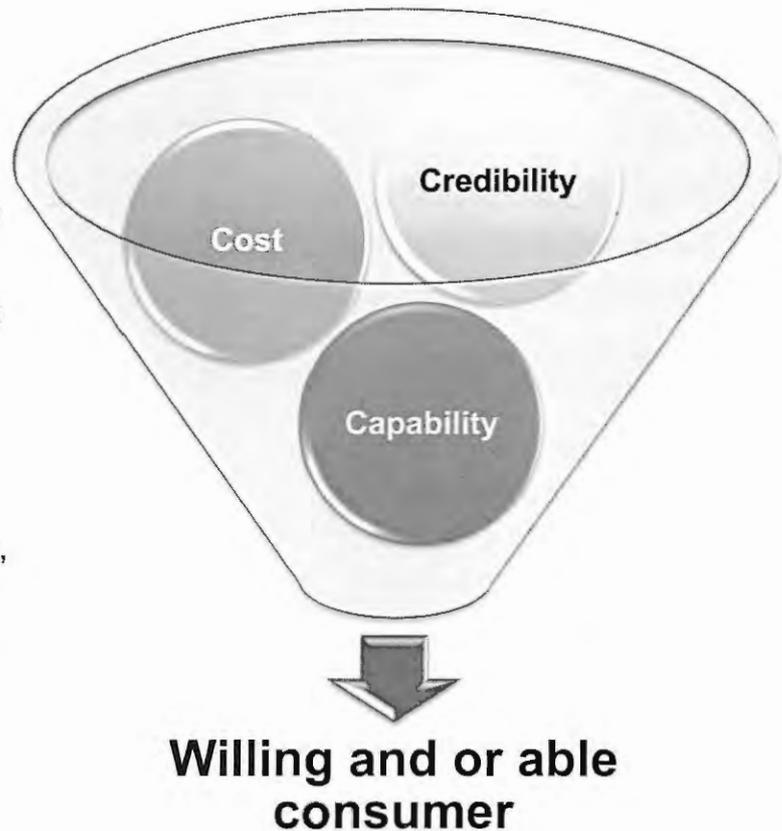
Village 7.30%

Farmer 10.37%

Distribution – reaching the customer

Don't reinvent the wheel:

- Agriculture sector not a big buyer of “insurance”
- Partner with existing distribution methodologies and networks
 - Banks, input providers and output merchants
- Education and transparency critical to minimise reputation risk
- Leverage off extension services, co-ops and adviser networks
- Every dollar of distribution cost reduces the farmers (or taxpayers) buying power



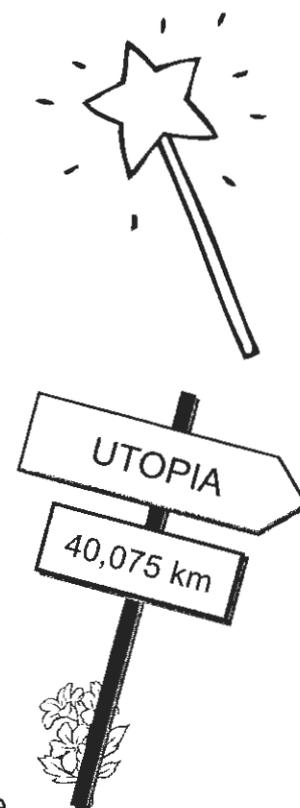
Claims: Not just the dollars



- Accuracy of loss assessment is critical but not sacrosanct
- Farmers need confidence in and transparency of loss assessment process
- Ideally claim settlement period should mirror cash flow from undamaged/harvested crop or sold animals (temporal indemnity)
 - If cash crops – in time to replant/plant next season
 - If subsistence farming – quick enough to put food on table
- Sum insured should be meaningful – ability to rebound from losses and continue farming

In conclusion.....

- Be aware of all the stakeholders
- Insurance is what you do with what's left after management and resilience have done all they can
- Can't compete with free handouts – shift to pre-event funding or qualified post event funding
- Have the rate reflect the risk – don't distort the truth
- Get quality data and protect against the unexpected, not the everyday
- Know the risk, rate accordingly
- Show us some skin.....
- Basis risk can (& often does) bite both ways
- Leverage your distribution – don't create excessive costs
- We are selling a promise to pay – make it a good one



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levels, (vi) the extent of credit defaults, (vii) interest rate levels, (viii) currency exchange rates including the Euro/U.S. Dollar exchange rate, (ix) changing levels of competition, (x) changes in laws and regulations, including monetary convergence and the European Monetary Union, (xi) changes in the policies of central banks and/or foreign governments, (xii) the impact of acquisitions, including related integration issues, (xiii) reorganization measures, and (xiv) general competitive factors, in each case on a local, regional, national and/or global basis. Many of these factors may be more likely to occur, or more pronounced, as a result of terrorist activities and their consequences.

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Impacts of Climate Change on Mekong River Delta's Rice Crop Yields



Shie-Yui LIONG

Tropical Marine Science Institute,
National University of Singapore

3rd Asia Agriculture Insurance Conference, 20 - 21 September 2016, Singapore

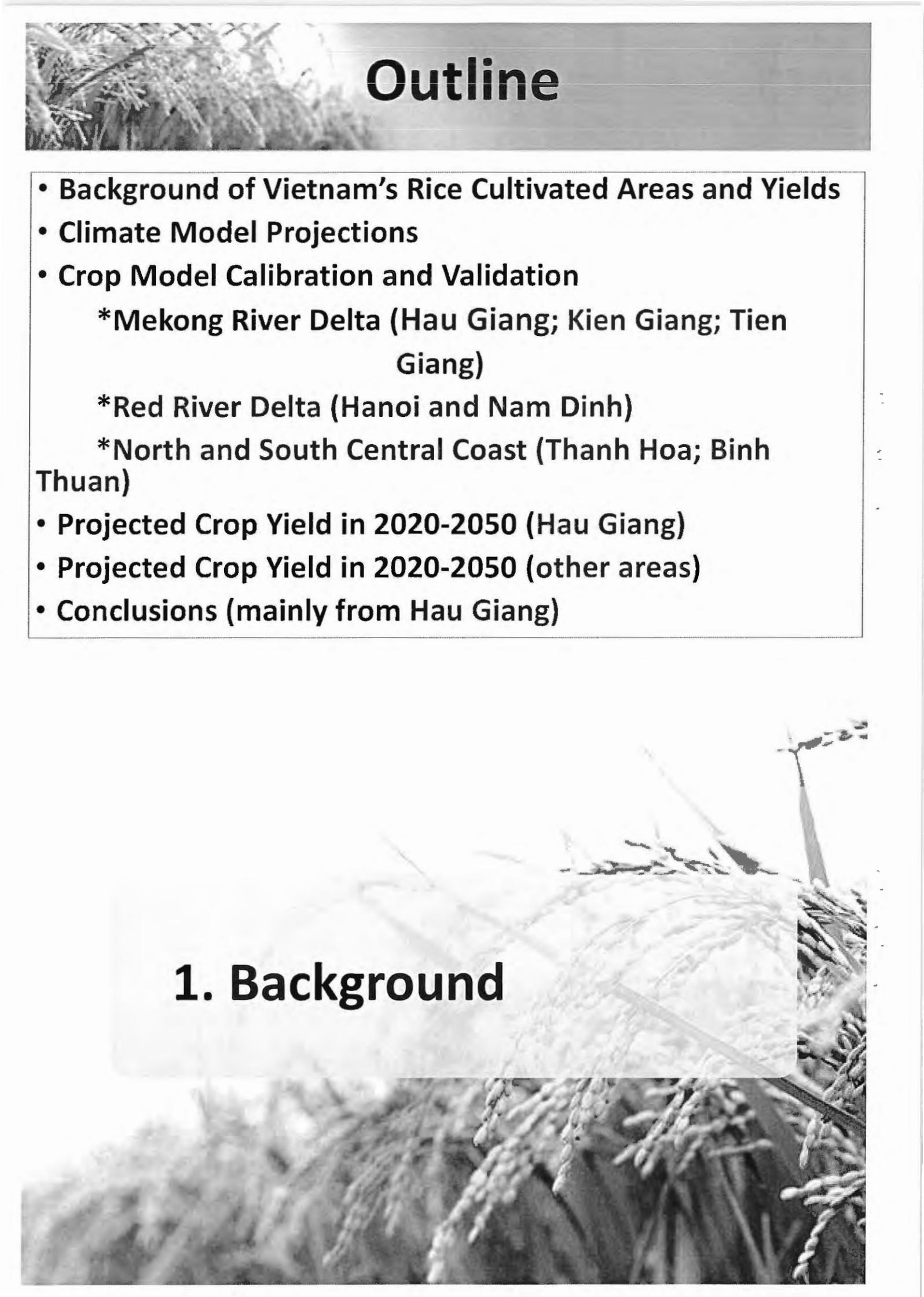
Team Members

TMSI: JIANG Ze, Srivatsan RAGHAVAN, HUR Jina

CENSAM/SMART: Chien WANG

CanTho: NGUYEN Van Qui, VAN PHAM Dang Tri

ARC: Roman HOHL, Tom OSBORNE



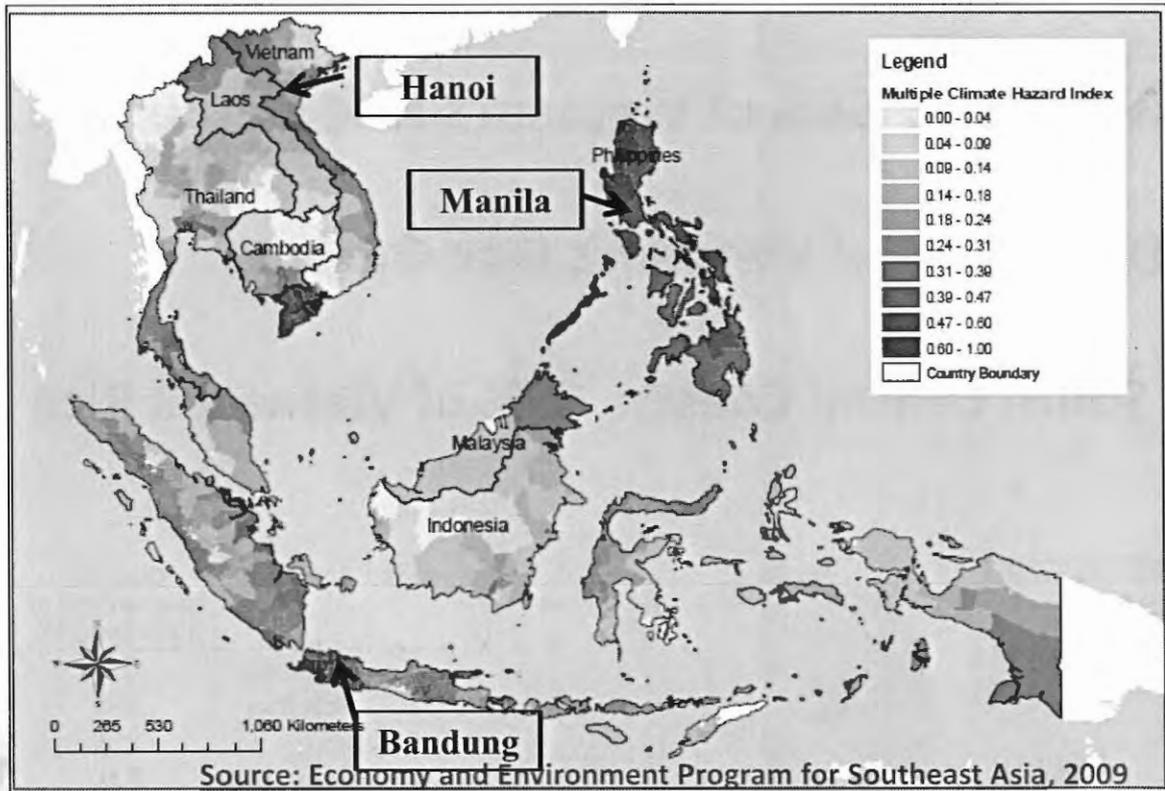
Outline

- **Background of Vietnam's Rice Cultivated Areas and Yields**
- **Climate Model Projections**
- **Crop Model Calibration and Validation**
 - * **Mekong River Delta (Hau Giang; Kien Giang; Tien Giang)**
 - * **Red River Delta (Hanoi and Nam Dinh)**
 - * **North and South Central Coast (Thanh Hoa; Binh Thuan)**
- **Projected Crop Yield in 2020-2050 (Hau Giang)**
- **Projected Crop Yield in 2020-2050 (other areas)**
- **Conclusions (mainly from Hau Giang)**

1. Background

Climate Vulnerability over Southeast Asia

(Floods, Droughts, Sea Level Rise, Landslides and Cyclones)

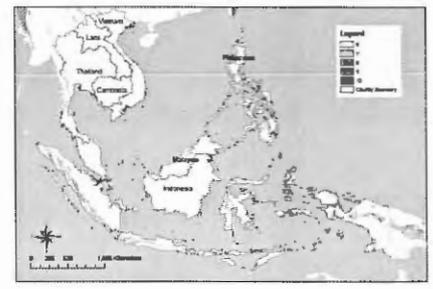
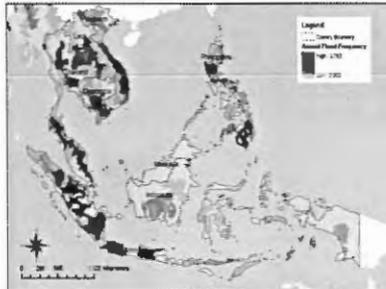


Many regions in Southeast Asia are very vulnerable!

TYPHOON

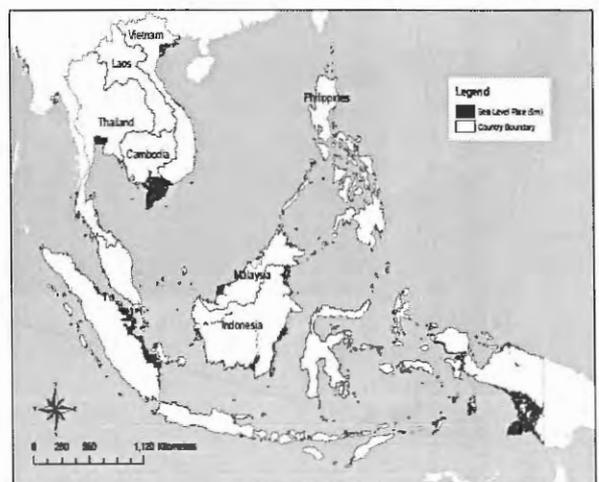
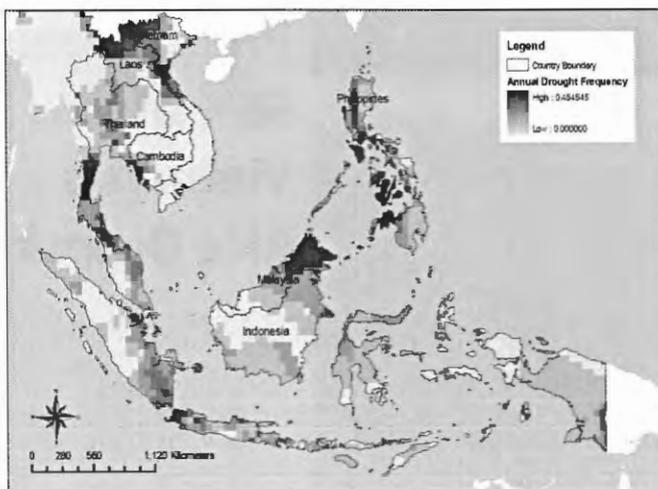
FLOOD

LANDSLIDES



DROUGHT

SEALEVEL RISE



Major Rice Cultivated Areas

Mekong River Delta: 56% of Vietnam's Rice Output

Red River Delta: 15% of Vietnam's Rice Output

North and South Central Coasts: 15% of Vietnam's Rice Output

PERCENTAGE BREAKDOWN OF TOTAL IMPORTS

India, Thailand and Vietnam supply **90.7 per cent** of total rice imports.

INDIA 32.9%
THAILAND 30.4%



Rank	Country	Quantity (percentage of total imports)
4	Myanmar	2.5
5	Pakistan	2.4
6	US	2.2
7	Cambodia	0.9
8	Australia	0.6
	Others	0.7

Sources: RICE IMPORTERS, INTERNATIONAL ENTERPRISE (IE) SINGAPORE

Study Areas

Mekong River Delta (Hau Giang, Kien Giang, Tien Giang)

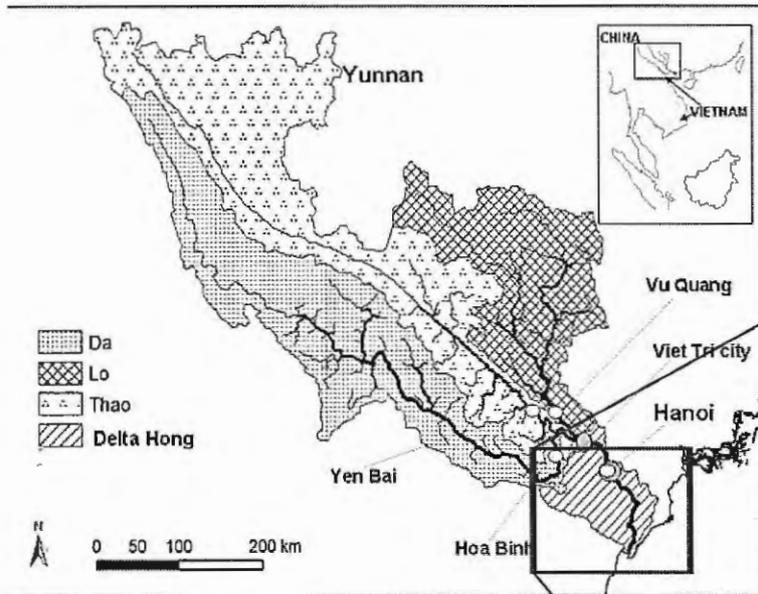


MRD's Rice Production: 56% of Vietnam's Rice Output

Mekong River Basin + Mekong River Delta

Study Areas

Red River Delta (Hanoi; Nam Dinh)



Red River Basin

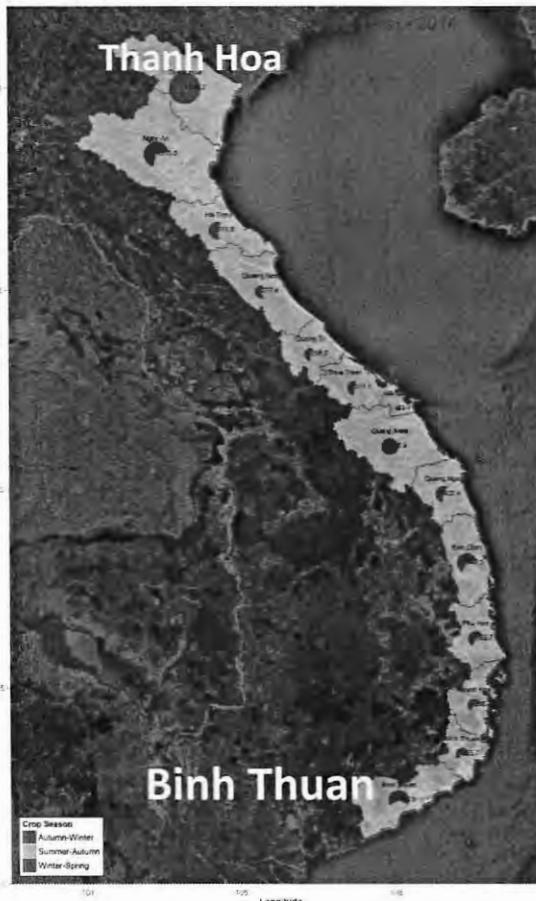
Red River Delta in Vietnam



**RRD's Rice Production:
15% of Vietnam's Rice Output**

Study Areas

North and South Central Coasts (Thanh Hoa; Binh Thuan)



**NSCC's Rice Production:
15% of Vietnam's Rice Output**

Mekong River Delta (MRD)

In 2014

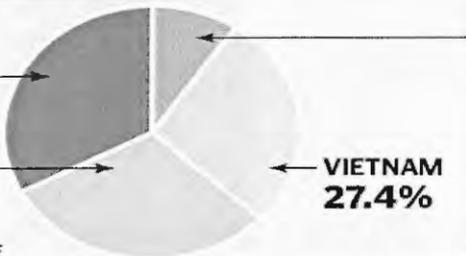
- Rice cultivated area in MRD: 4.246.800 ha (about 54% of Vietnam's rice cultivated area)
- Rice yield from MRD: 25.244.200 tons (about 56% of Vietnam's rice output)
- Rice EXPORT from MRD: about 90% of Vietnam's rice export
- Singapore's rice IMPORT from Vietnam: about 28%

PERCENTAGE BREAKDOWN OF TOTAL IMPORTS

India, Thailand and Vietnam supply **90.7 per cent** of total rice imports.

INDIA
32.9%

THAILAND
30.4%



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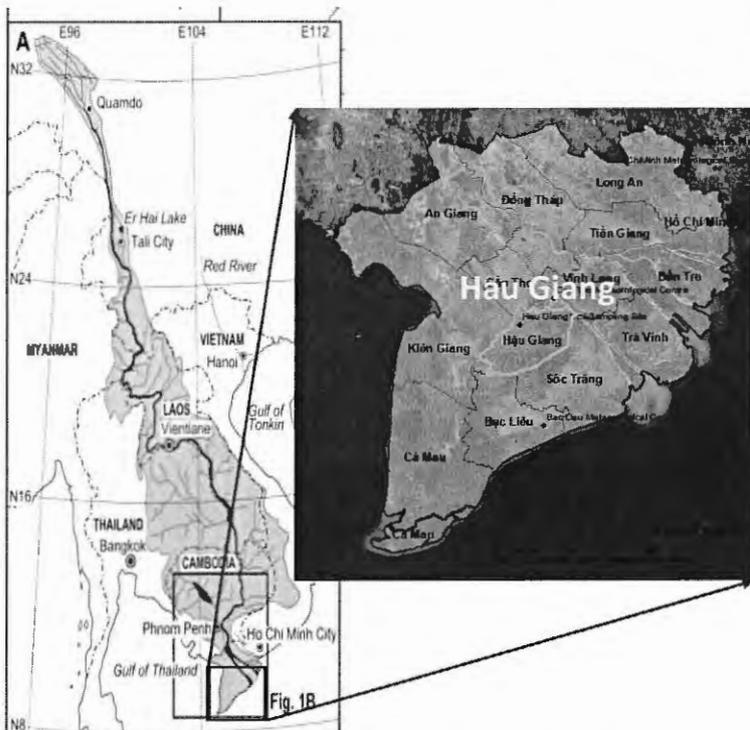
Sources: RICE IMPORTERS, INTERNATIONAL ENTERPRISE (IE) SINGAPORE

Study Area: Hau Giang

MEKONG RIVER DELTA



HAU GIANG



Basic Information(2014)	Mekong River Delta	Hau Giang Province
Total Area (million ha)	4.05	0.16 (4% of MRD)
Agricultural land(million ha)	2.61	0.13 (5% of MRD)
Planted Area of Rice(million ha)	4.20	0.21 (5% of MRD)
Annual Yield (t/ha)	5.94	5.85
Rice Production (million tons)	25.24	1.20 (4.8% of MRD)

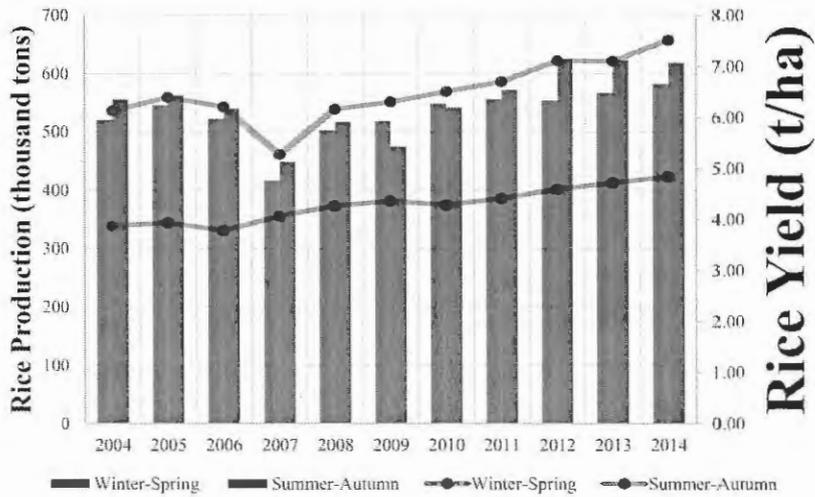
Rice cropping pattern	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
	Winter-Spring				Summer-Autumn				Autumn-Winter			
	1,600,000 ha				2,200,000 ha				400,000 ha			

MRD: 2 or 3 crops per year

Hau Giang: 2 crops per year

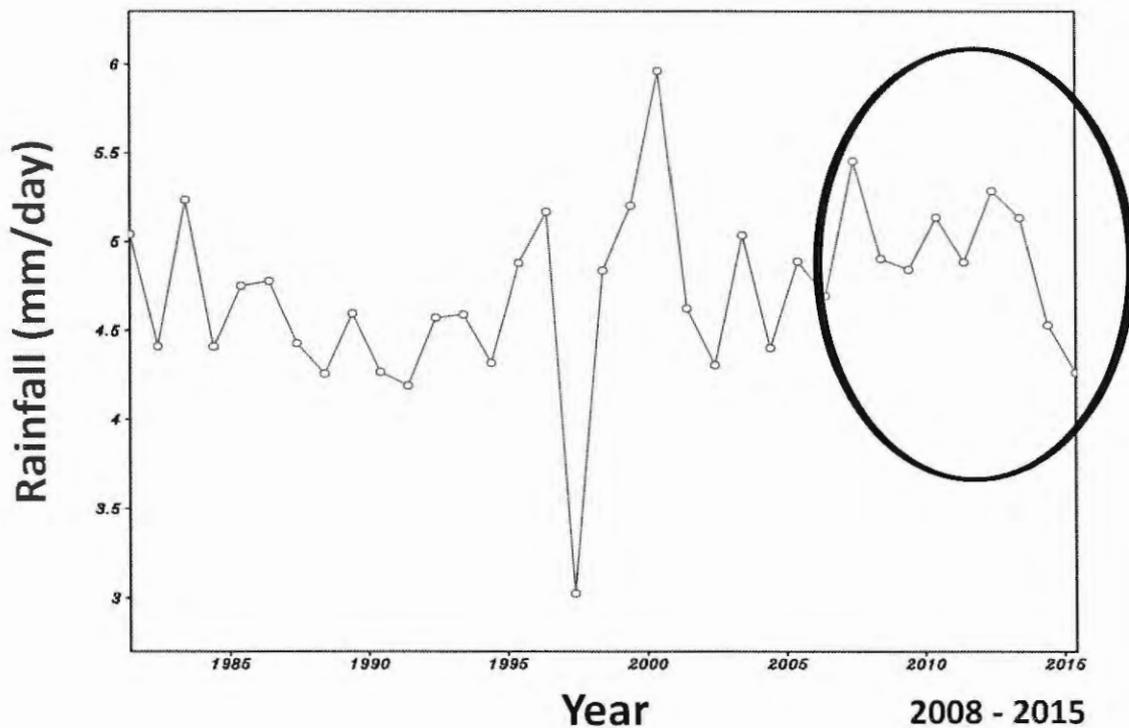
Rice Yield in Hau Giang (2004 – 2014)

Hau Giang Rice Production

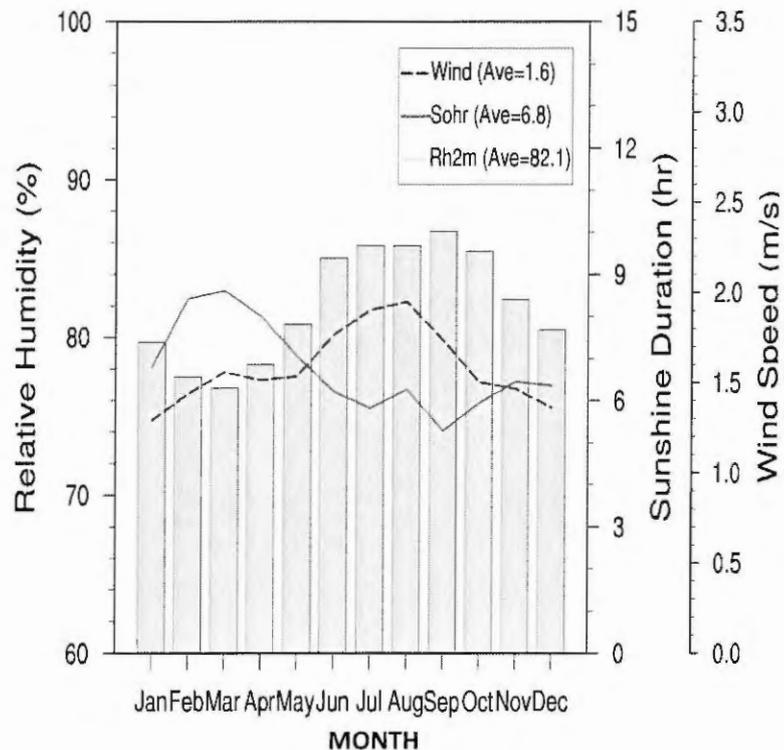
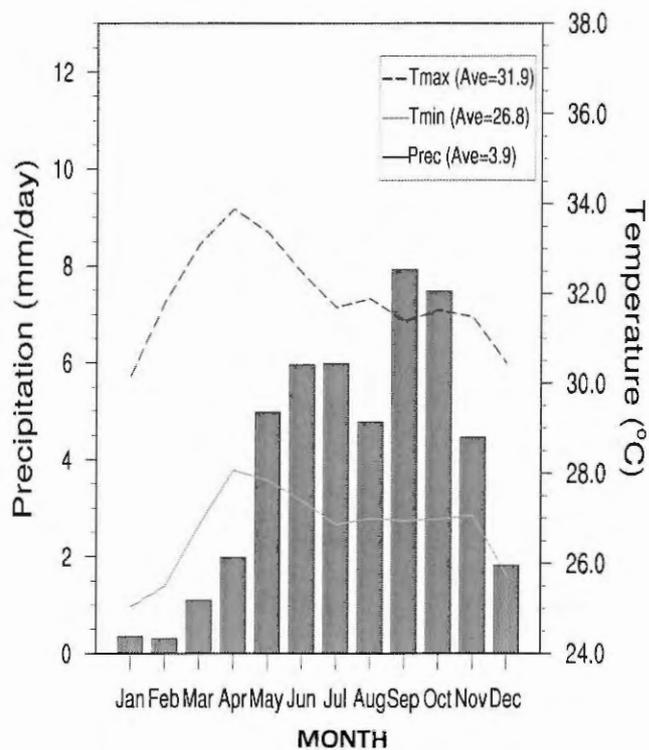


Higher productivity in Winter-Spring season ---- Less pest, less pollination failure due to less heavy rain, easier to manage due to less cultivated area

Observed Rainfall over MRD (35 Years; 1981-2015)



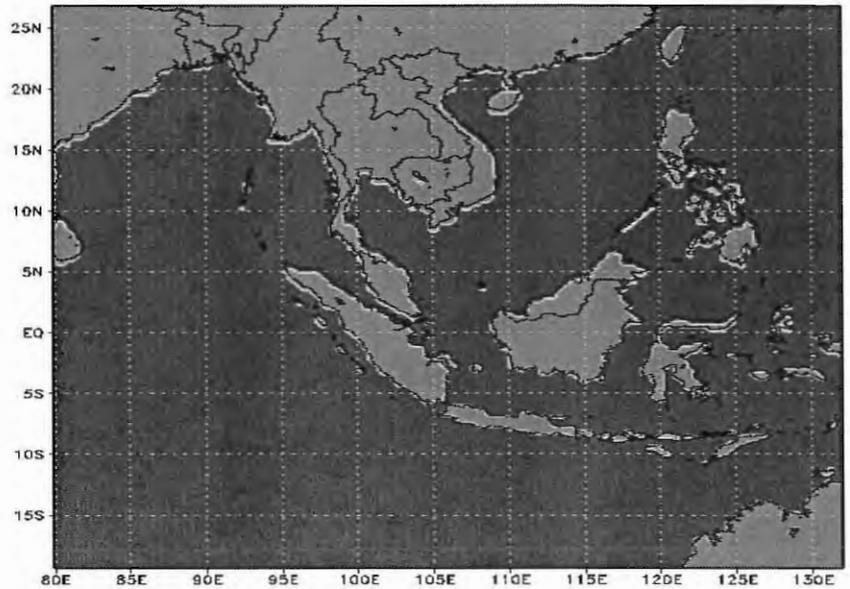
Present Climatology (2005-2014)



2. Climate Model Projection

Dynamical Downscaling Domain: Southeast Asia

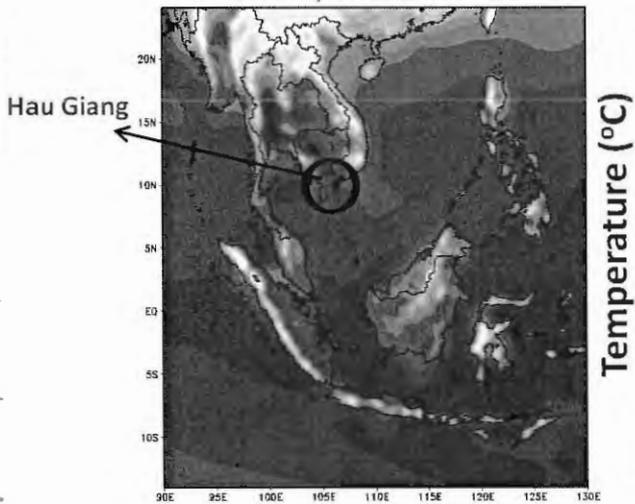
GCM	Resolution	Emission
CCSM3	1.4° x 1.4°	A1FI, A2, A1B
ECHAM5	1.8° x 1.8°	A2, A1B
MIROC	2.8° x 2.8°	A2, A1B



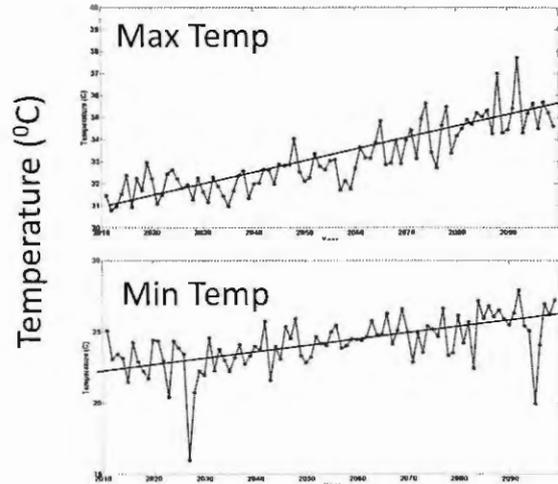
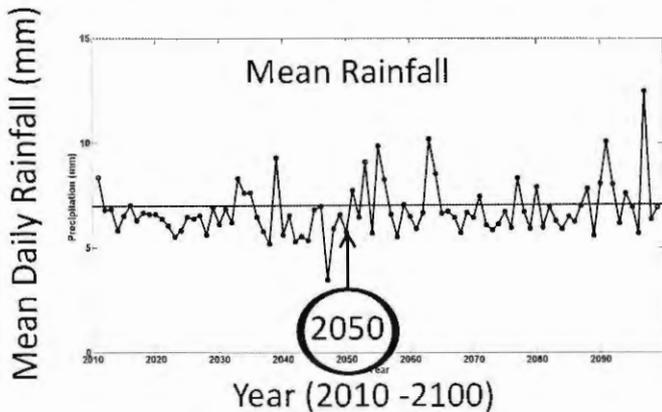
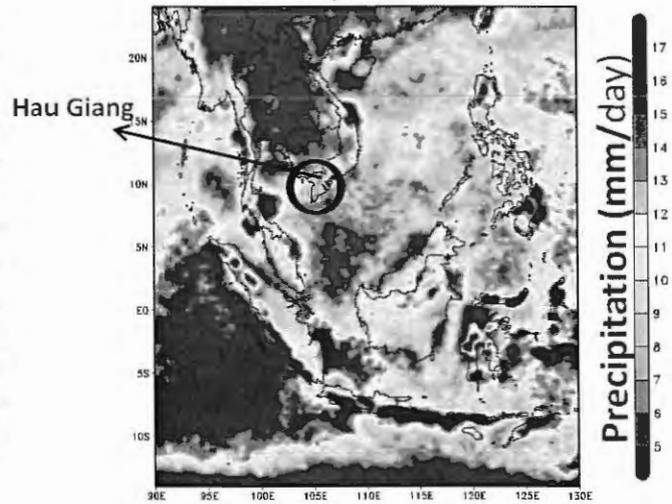
Spatial Resolution: 30 x 30 km

Model Used: WRF (NCAR)

Projected Temperature
T2 WRF/ECHAM A2 2011



Projected Precipitation
PRECIP WRF/ECHAM A2 2011



Model Evaluations: Gridded observation data

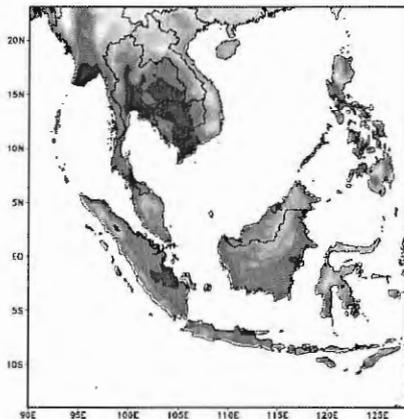


Name	Resolution (°)	Time frame	Parameter	Interval	Source	Area	Institution	Country
CRU	0.5	1901-present	P, T	monthly	gauge	global land	University of East Anglia, UK	UK
UDEL	0.5	1901-2010	P, T	monthly	gauge	global	University of Washington	USA
CPC	0.5	1948-present	P, T	monthly	gauge	global	National Oceanic and Atmospheric Administration	USA
GPCC	0.5	1901-2010	P	monthly	gauge	global	Deutscher Wetterdienst	Germany
APH (APHRODITE)	0.5 (0.25)	1951-2007	P, T	daily	gauge	Asia above 15S land	Japan Meteorological Research Institute	Japan

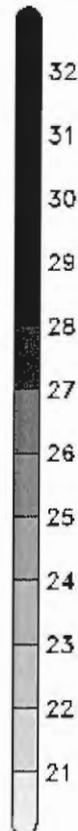
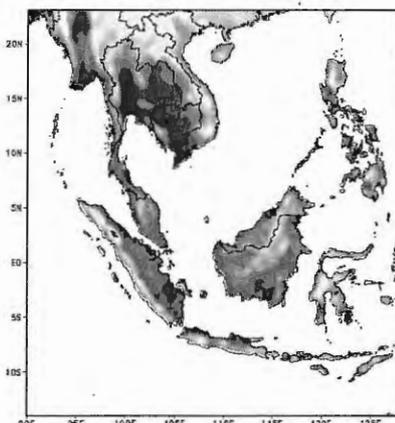
P=Precipitation; T=Temperature

Surface Temperature (°C), 1961-1990

CRU
Observed



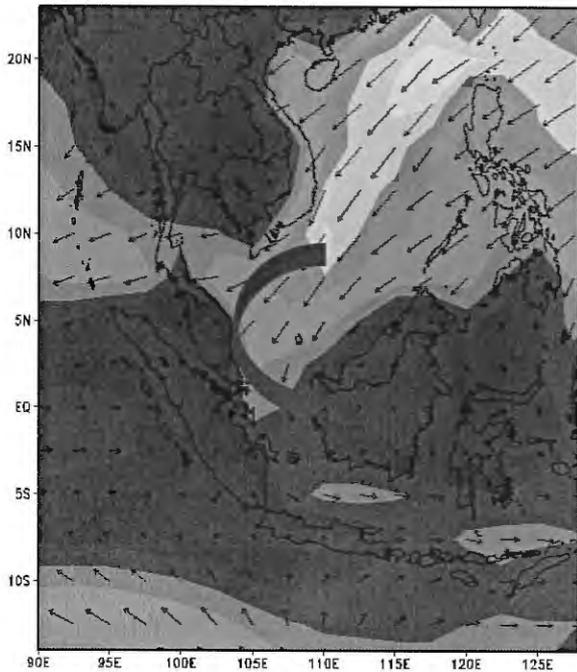
WRF/ERA40
Simulated



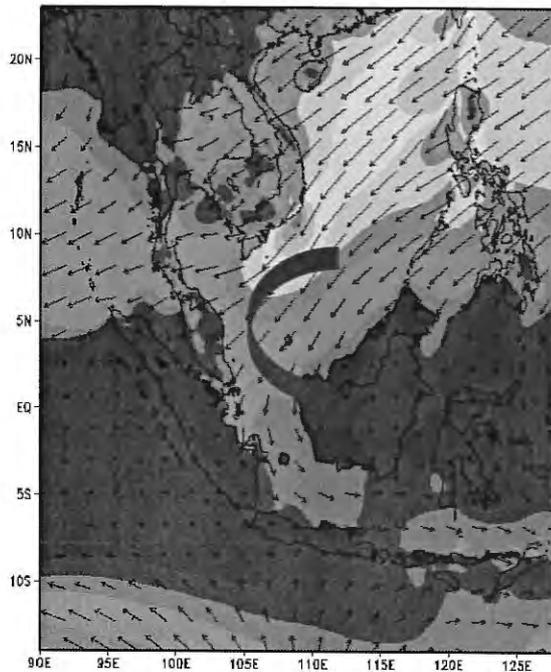
Topography over Southeast Asia

Northeast Monsoon (NDJF)

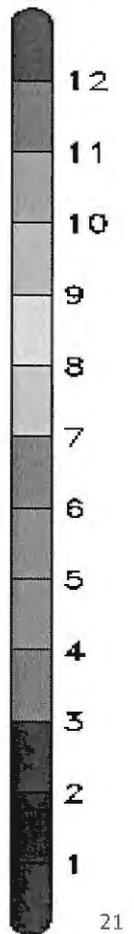
Surface Winds (m/s) ; 1961-1990



**ERA40
Observed**



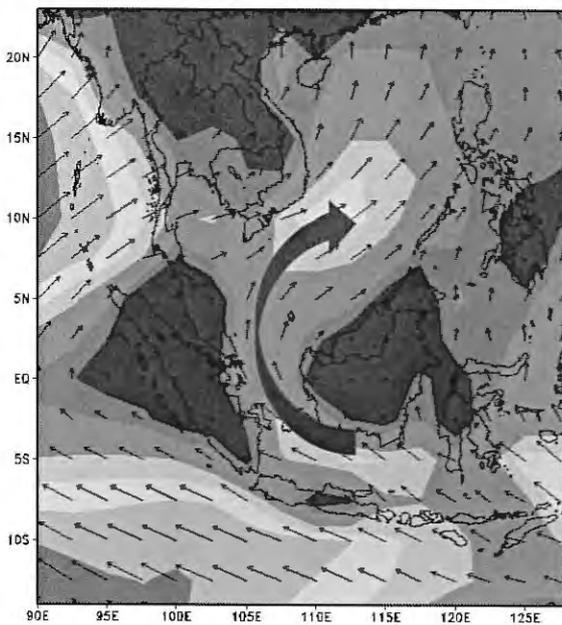
**WRF/ERA40
Simulated**



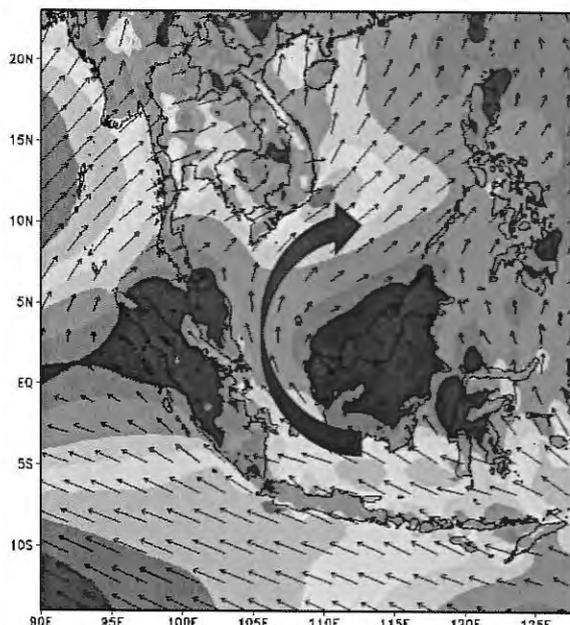
21

Southwest Monsoon (JJA)

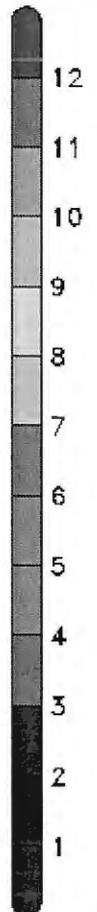
Surface Winds (m/s); 1961-1990



**ERA40
Observed**



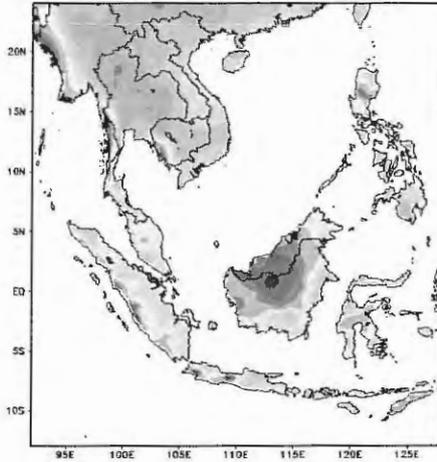
**WRF/ERA40
Simulated**



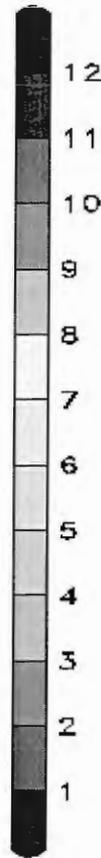
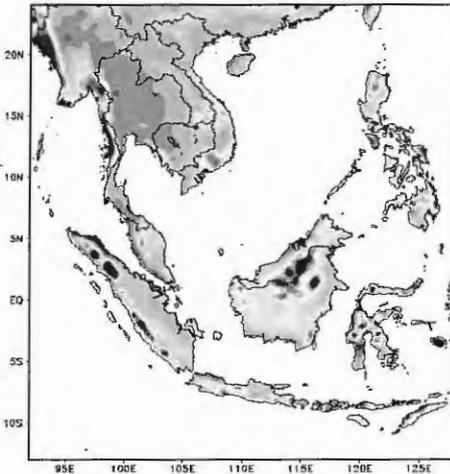
22

Precipitation (mm/day), 1961-1990

**CRU
Observed**



**WRF/ERA
Simulated**



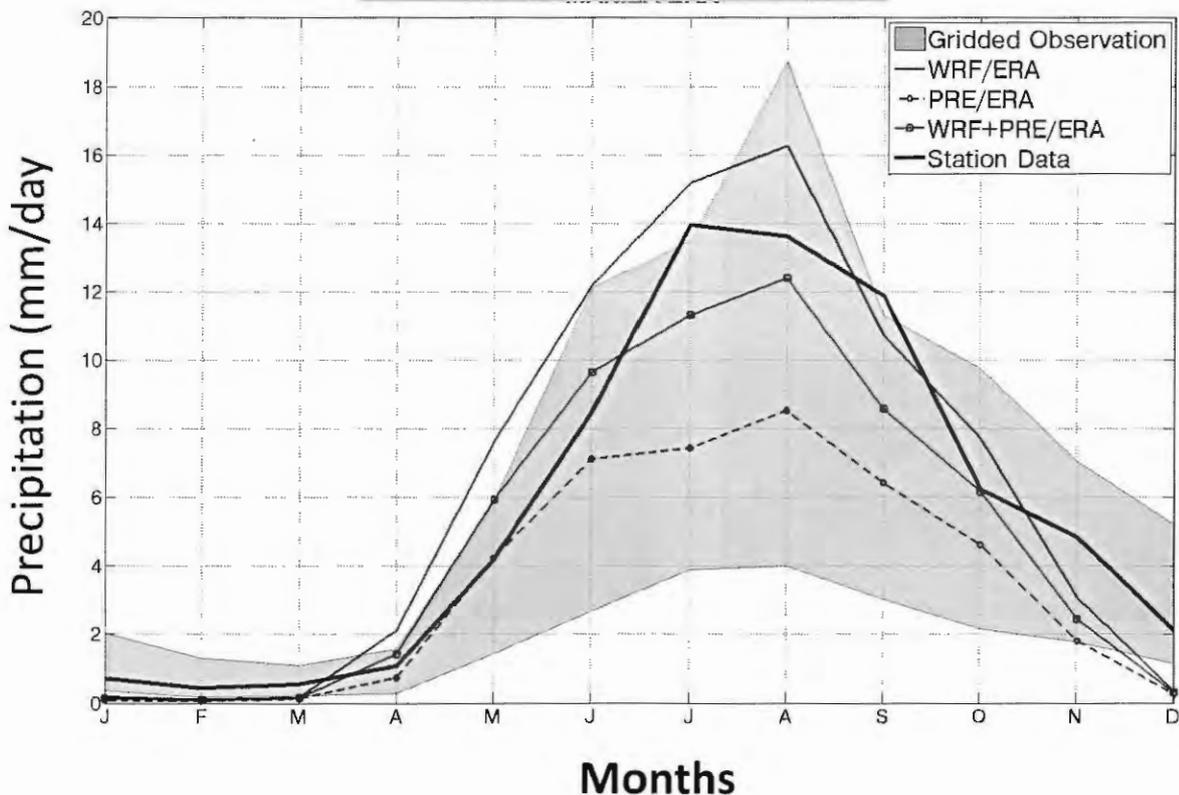
Topography over Southeast Asia



RCMs' performance on MANILA

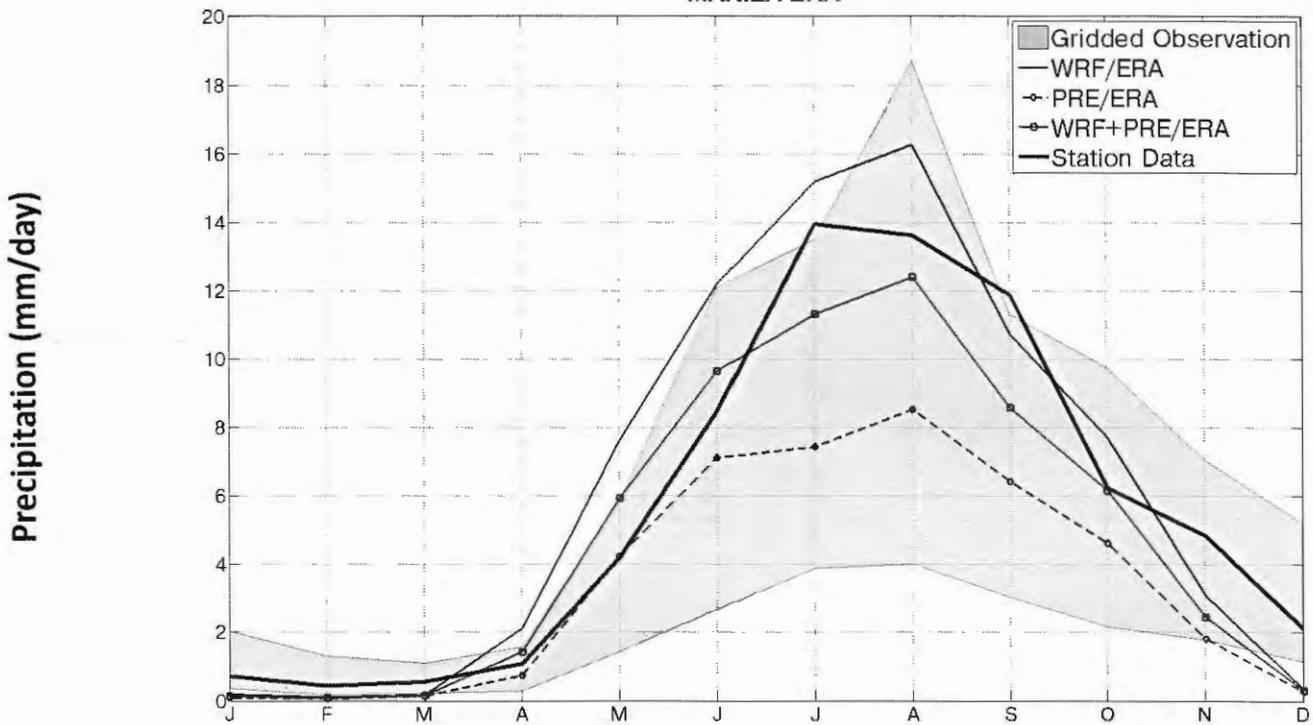


RCMs driven by ERA40



RCMs' performance on MANILA

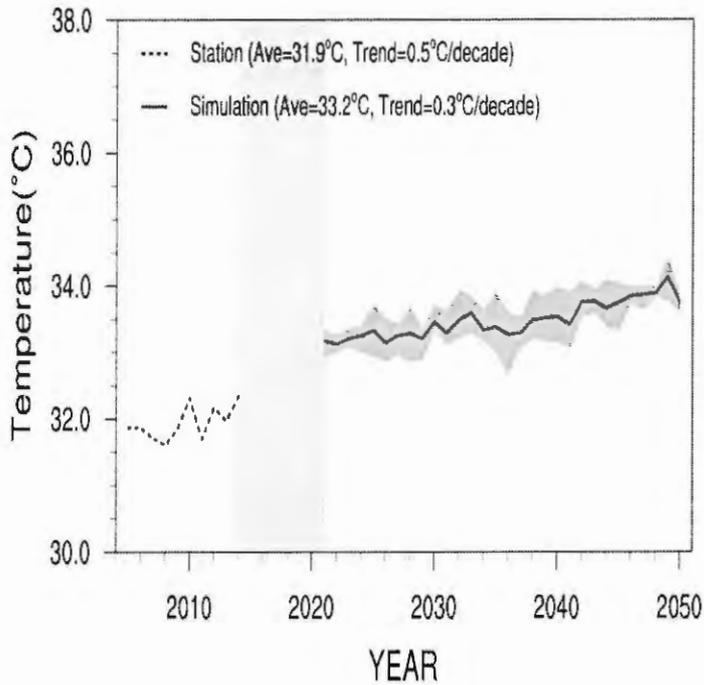
RCMs driven by ERA40



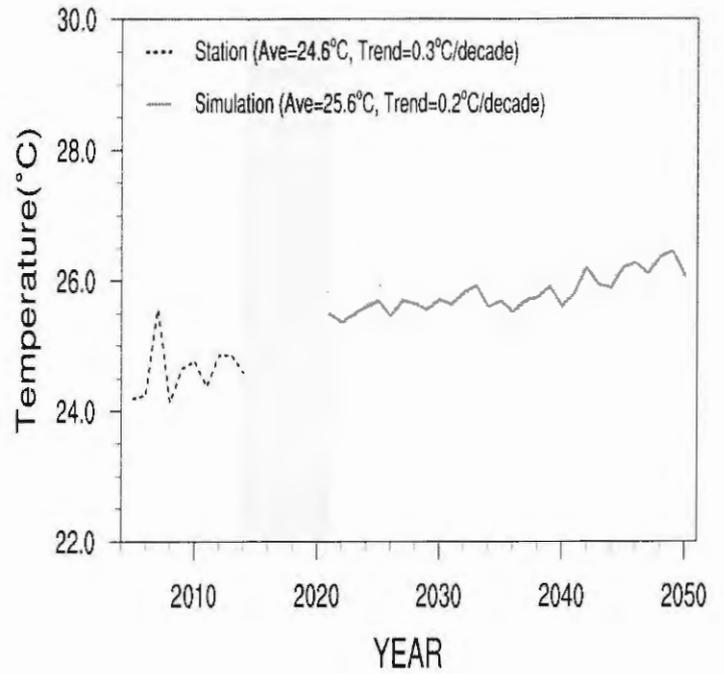
RCMs' performance on Bandung

Projected Temperature at MRD (2020-2050)

(a) Maximum Temperature

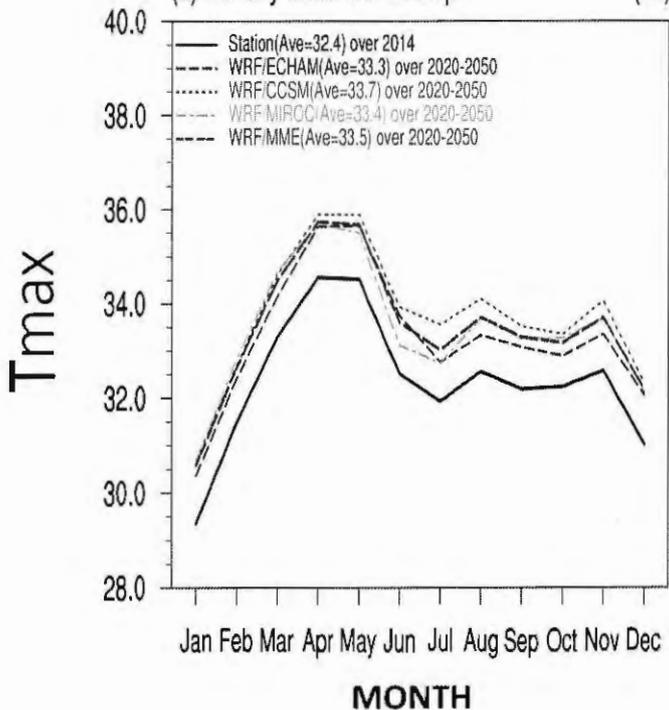


(b) Minimum Temperature

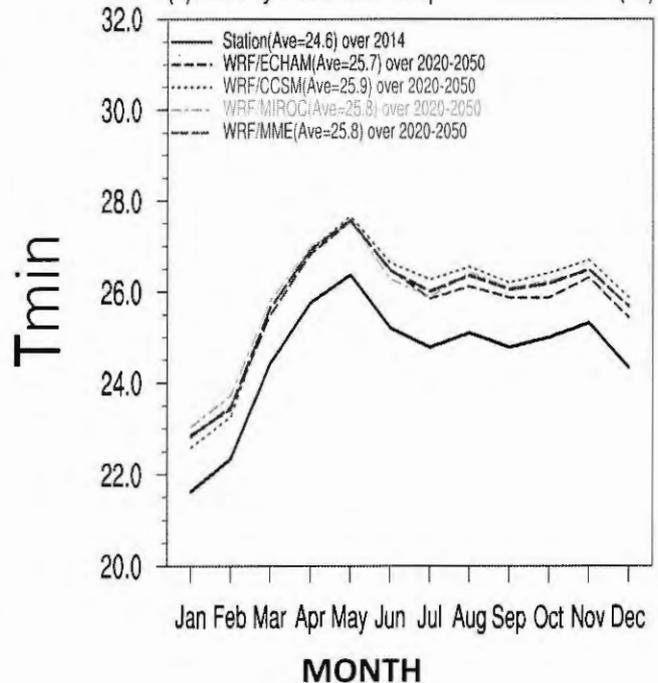


Projected Temperature at MRD (2020-2050): Annual Cycle

(a) Monthly Mean Max. Temp. (°C)

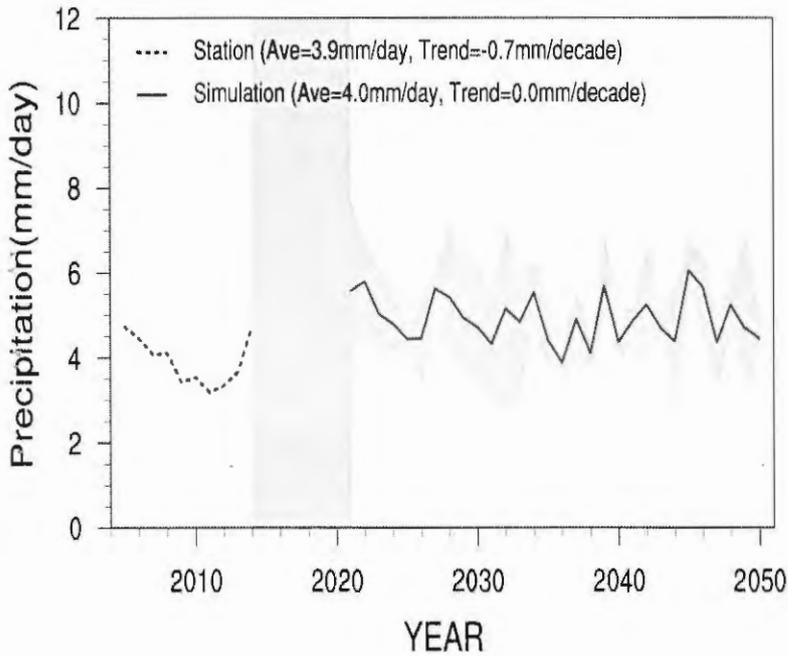


(a) Monthly Mean Min. Temp. (°C)

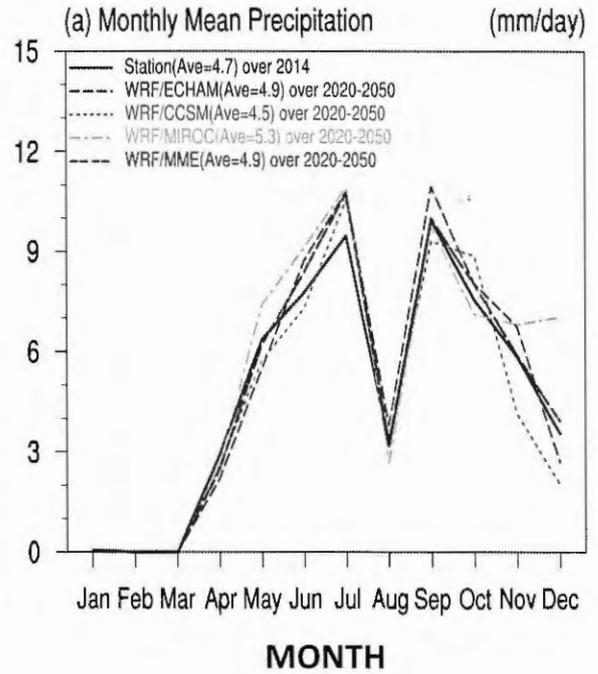


Projected Precipitation at MRD (2020-2050)

Daily Precipitation



Mean Precipitation's Annual Cycle



3. Crop Model Calibration and Validation (Hau Giang)

Field Survey (Hau Giang province)



Seasonal Experiment Setup in DSSAT

	Inputs	Source/Name/Type	
Present	Weather	Observation data	
	Calibration	Cultivar	Fragrant Rice (OM4900)
		Soil	Riverine Fluvial Soil (Hau Giang 2015)
		Management	Continuous flooding; with fertilization
Future	Weather	Observation data	
	Validation	Cultivar	Fragrant Rice (OM4900HG, Calibrated)
		Soil	Riverine Fluvial Soil (Hau Giang 2015)
		Management	Continuous flooding; with fertilization
Future	Weather	GCMs: CCSM, ECHAM, MIROC	
		Cultivar	Fragrant Rice (OM4900HG, Calibrated)
		Soil	Riverine Fluvial Soil (Hau Giang 2015)
		Management	Continuous flooding; with fertilization

Model: DSSAT (Decision Support System for Agrotechnology Transfer)

Model Calibration and Validation

Calibrated cultivar coefficients:

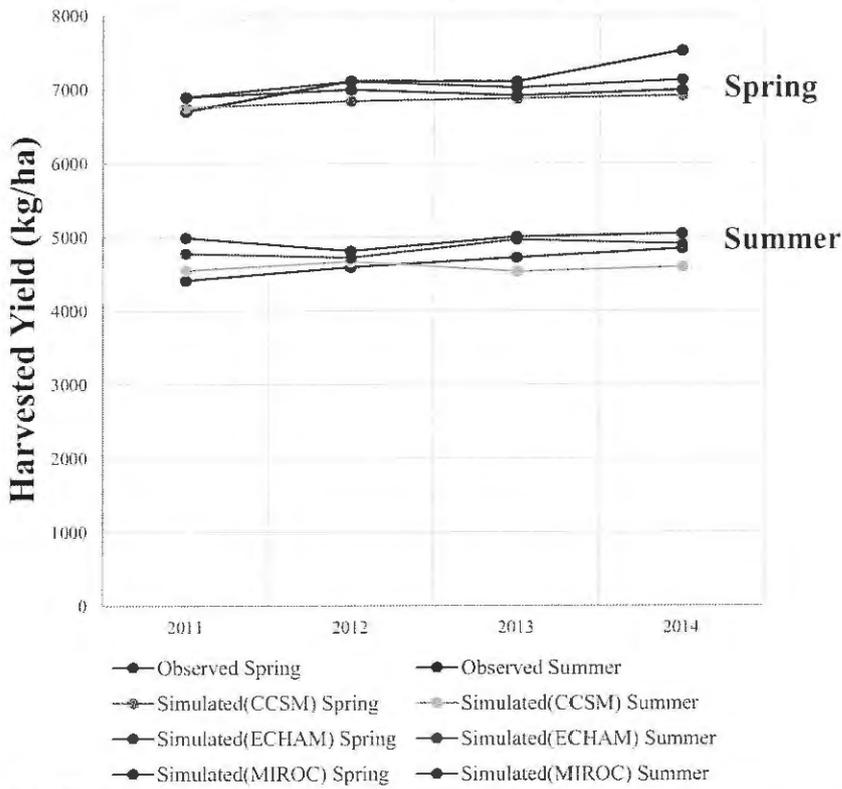
Coefficient	Explanation	Unit	Initial Value	Calibrated Value
P1	Thermal time between emergence and basic vegetative phase	°C	625.5	594.2
P2R	Extent to which phasic development leading to panicle initiation is delayed (thermal time)	°C	312.6	282
P5	Thermal time between grain filling and physiological maturity	°C	393.6	499.9
P20	Critical photoperiod or longest day length at which the development occurs at maximum rate	hours	12	13.23
G1	Potential spikelet coefficient	-	55	69.3
G2	Potential single grain weight under ideal growing conditions	gram	0.0265	0.0265
G3	Tillering coefficient under ideal conditions	-	1	1
G4	Temperature tolerance coefficient	-	1	1
PHINT	Thermal time between emergence of successive leaf tips	°C	83	83

Main growth and development variables	Calibration		Validation	
	SIMULATED	MEASURED	SIMULATED	MEASURED
Anthesis day (dap)	62	62	63	60
Physiological maturity day (dap)	95	95	95	95
Yield at harvest maturity (kg [dm]/ha)	5824	5827	5573	5490
Unit weight at maturity (g [dm]/unit)	0.0265	0.026	0.0265	0.026

4. Projected Crop Yield in 2020-2050 (Hau Giang)

Model Validation

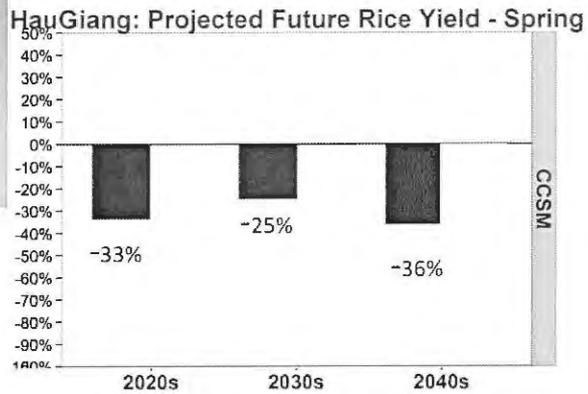
Validation at Hau Giang (2011-2014)



Projected Future Rice Yield (2020-2050)

Winter-Spring Season

Projected changes in potential yields relative to 2004-2014 mean(%)



Irrigation
 Rainfed
 Irrigated

**Rainfed Crop Yield:
 About 24%
 REDUCTION!**

Projected Future Rice Yield (2020-2050)

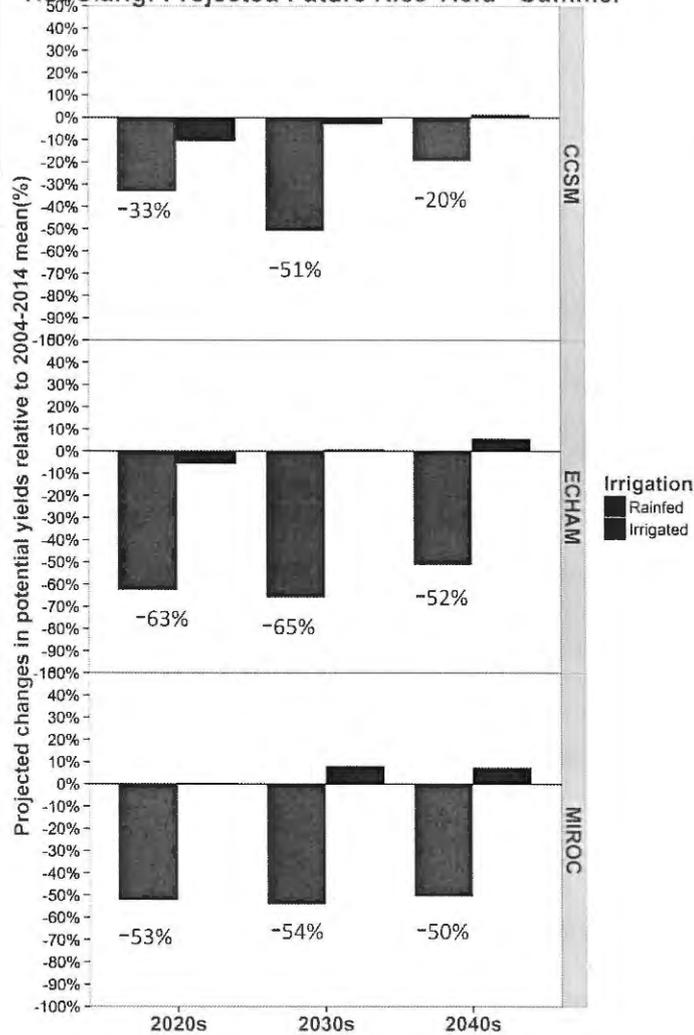
Summer-Autumn Season

Projected changes in potential yields, relative to 2004-2014 mean(%)

Rainfed Crop Yield: About 49% REDUCTION!

AVERAGE reduction from both Seasons: -35%

Hau Giang: Projected Future Rice Yield - Summer



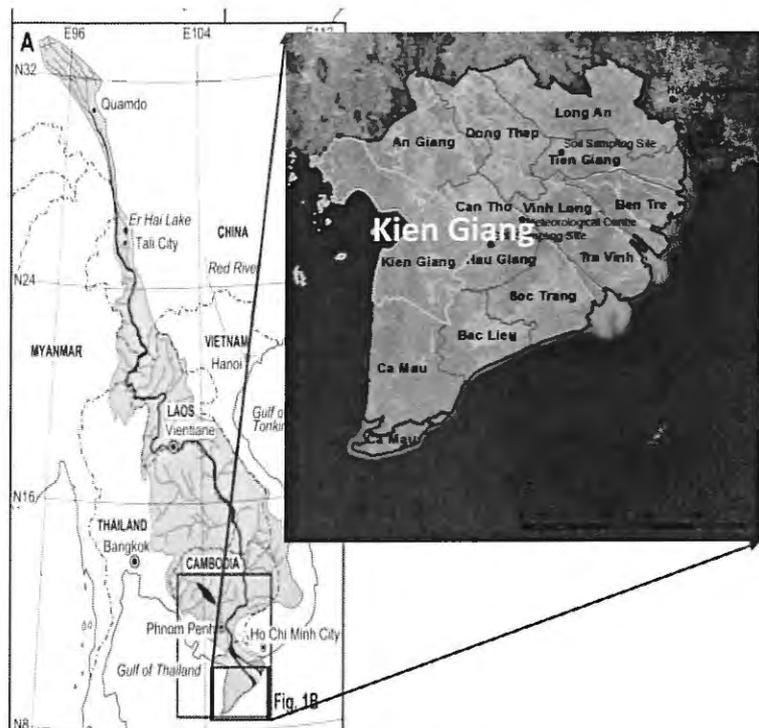
Results from other study areas?

Satellite: SoilGrids 1km released by ISRIC in 2014 & ISRIC-AfSIS at 1km resolution (ISRIC: the International Council for Science (ICSU))

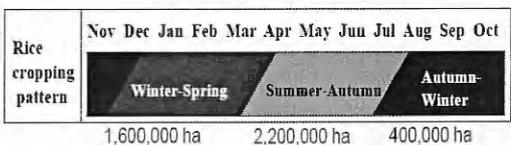
Study Area: Kien Giang

MEKONG RIVER DELTA

KIEN GIANG



Basic Information(2014)	Mekong River Delta	Kien Giang Province
Total Area (million ha)	4.05	0.635 (16% of MRD)
Agricultural land(million ha)	2.61	0.46 (18% of MRD)
Planted Area of Rice(million ha)	4.20	0.754 (18% of MRD)
Annual Yield (t/ha)	5.94	6.00
Rice Production (million tons)	25.24	3.23 (18% of MRD)



MRD: 2 or 3 crops per year

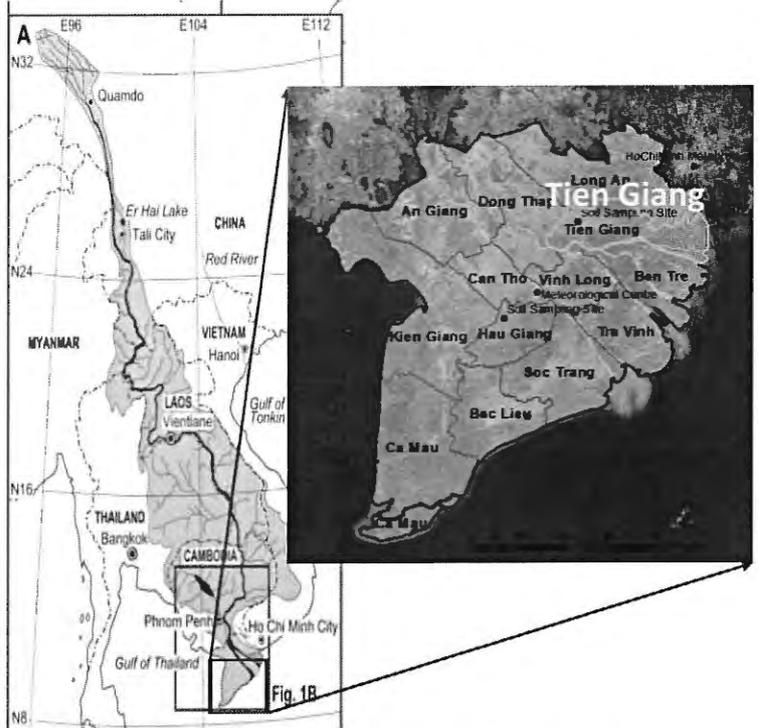
Kien Giang: 3 crops per year

Mekong River Basin + Mekong River Delta

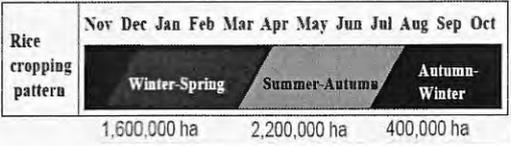
Study Area: Tien Giang

MEKONG RIVER DELTA

TIEN GIANG



Basic Information(2014)	Mekong River Delta	Tien Giang Province
Total Area (million ha)	4.05	0.251 (6% of MRD)
Agricultural land(million ha)	2.61	0.18 (6.9% of MRD)
Planted Area of Rice(million ha)	4.20	0.231 (5.5% of MRD)
Annual Yield (t/ha)	5.94	5.94
Rice Production (million tons)	25.24	1.37 (5.4% of MRD)



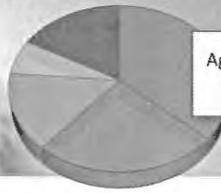
MRD: 2 or 3 crops per year

Tien Giang: 2 crops per year

Mekong River Basin + Mekong River Delta

Study Area: RRD

RED RIVER DELTA



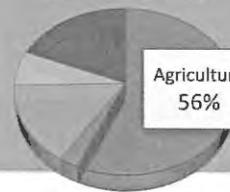
Agriculture
36%

HANOI

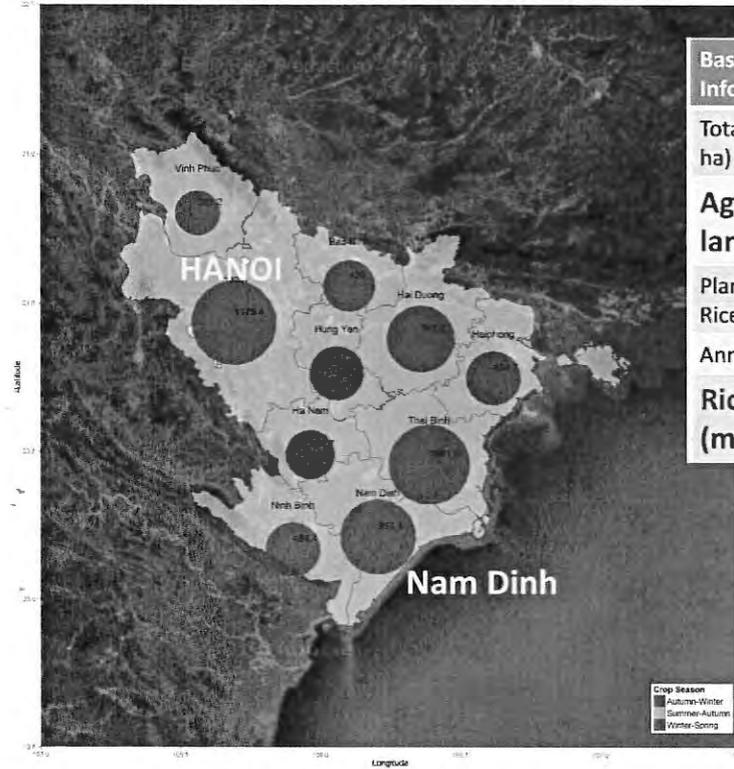


Agriculture
46%

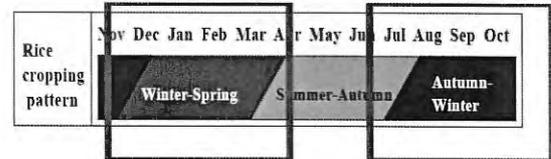
NAM DINH



Agriculture
56%



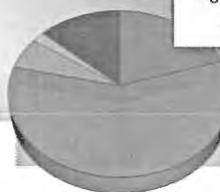
Basic Information(2014)	Red River Delta	HANOI	NAM DINH
Total Area (million ha)	2.11	0.332 (16% of RRD)	0.165(8% of RRD)
Agricultural land(million ha)	0.769	0.151 (20% of RRD)	0.093 (12% of RRD)
Planted Area of Rice(million ha)	1.123	0.203 (18% of RRD)	0.155 (14% of RRD)
Annual Yield (t/ha)	6.02	5.79	6.05
Rice Production (million tons)	6.757	1.175 (17% of RRD)	0.937 (14% of RRD)



RRD: Generally, 2 crops per year

North and South Central Coast

NSC



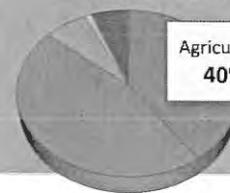
Agriculture
20%

THANH HOA

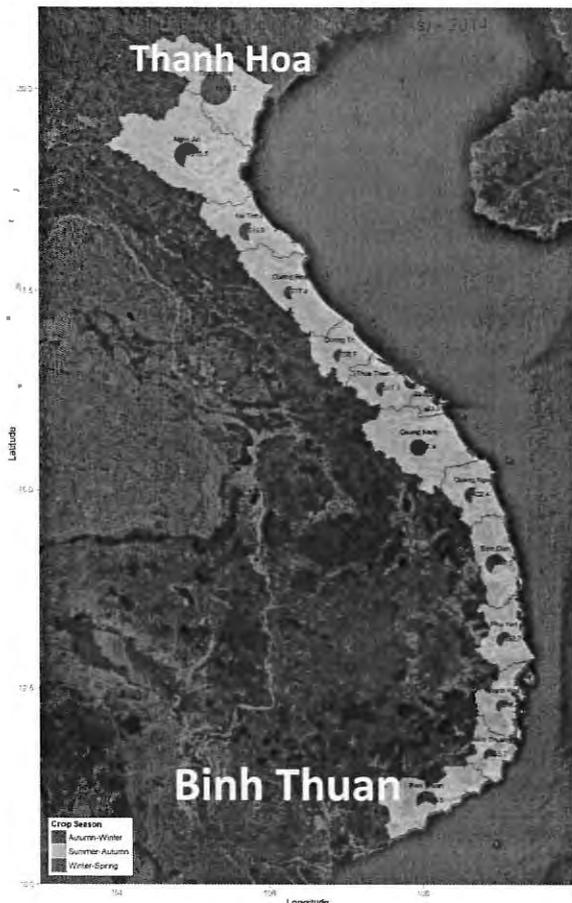


Agriculture
22%

BINH THUAN



Agriculture
40%



Basic Information(2014)	NSC	THANH HOA	BINH THUAN
Total Area (million ha)	9.538	1.113 (12% of NSC)	0.781 (8% of NSC)
Agricultural land(million ha)	1.902	0.248 (13% of NSC)	0.313 (16% of NSC)
Planted Area of Rice(million ha)	1.244	0.258 (20% of NSC)	0.119 (9% of NSC)
Annual Yield (t/ha)	5.67	5.86	5.60
Rice Production (million tons)	7.057	1.516 (21% of NSC)	0.669 (9% of NSC)



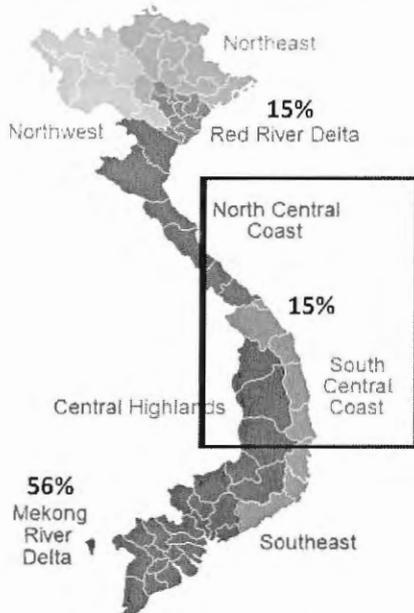
NSC:

Thanh Hoa: 2 crop seasons (Spring and Winter)

Binh Thuan: 3 crop seasons

Food Security Risk

Percentage of Paddy Production in 2014



Source: Figure from Wikipedia and Data from General Statistics Office of Vietnam

What is the anticipated combined Rice Reduction from Mekong River Delta, Red River Delta and the North+South Central Coasts in 2020-2050 ?

Preliminary results will be shared and discussed in the Conference.

5. Future Work

Future Work

A. For Economic and Food Security Considerations:

1. Continue collecting soil and cultivar (rice) data at the study areas and update their projected rice yield in 2020- 2050
2. Work with colleagues in Thailand and India to collate necessary information on soil and cultivar (rice) data
3. Consider some dominant vegetables and project their yields

For Educational Consideration:

Develop Serious Games, derived from the study, for teaching, and introduction to school children and public

6. Conclusions

Conclusions (based on Hau Giang's study only)

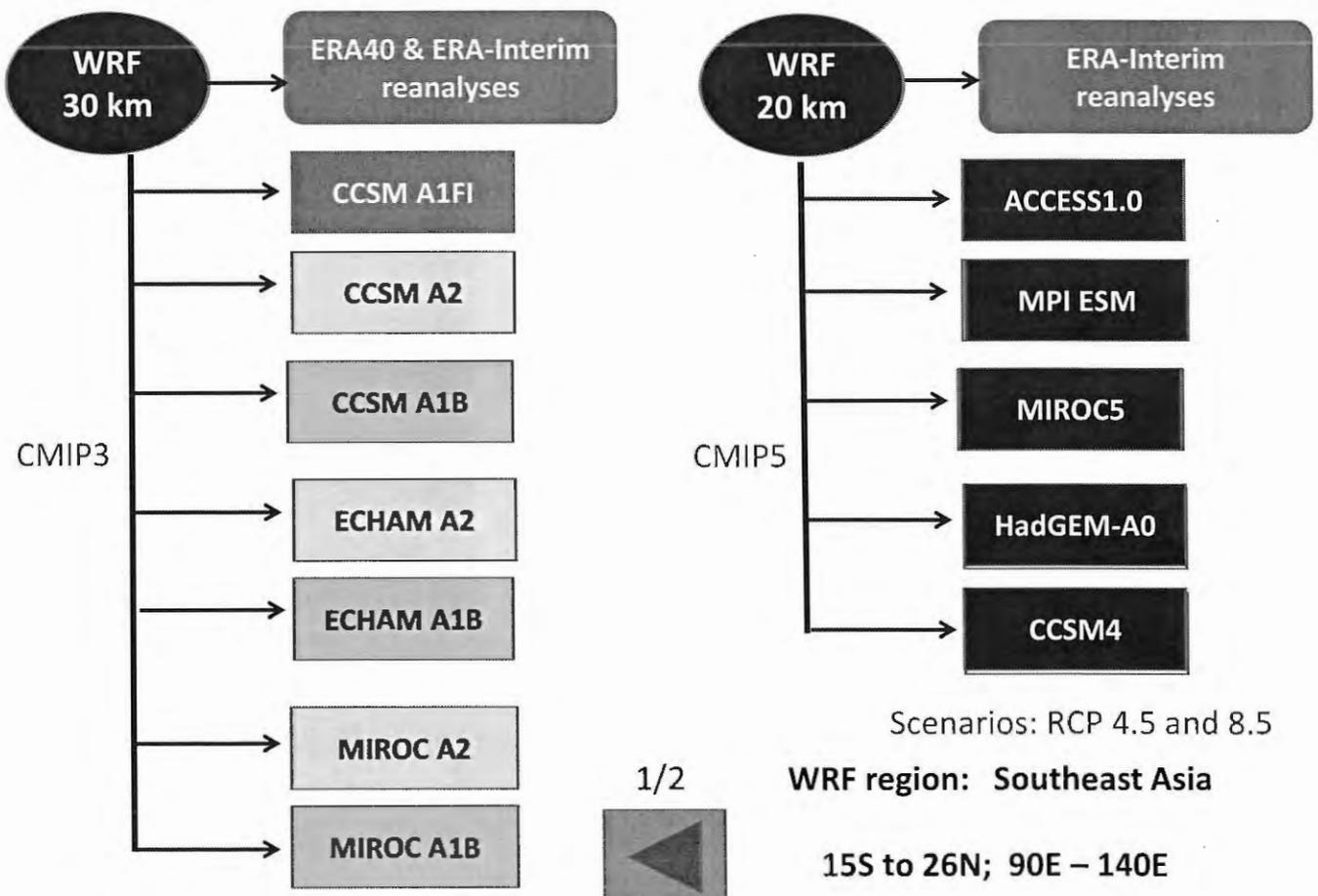
- Rainfed crops in general produce less yield than irrigated crops.
- Significant rice production reduction of about 35% is projected in 2020-2050 period --- as rainfall amount is projected to decrease.
- Irrigation could significantly improve crop yield. However, the challenge is to find water sources.
- Planting & Growing seasons may have to shift following the changing rainfall periods.
- To consider new breed of rice cultivars which require less water consumption

Conclusions (based on Hau Giang's study only)

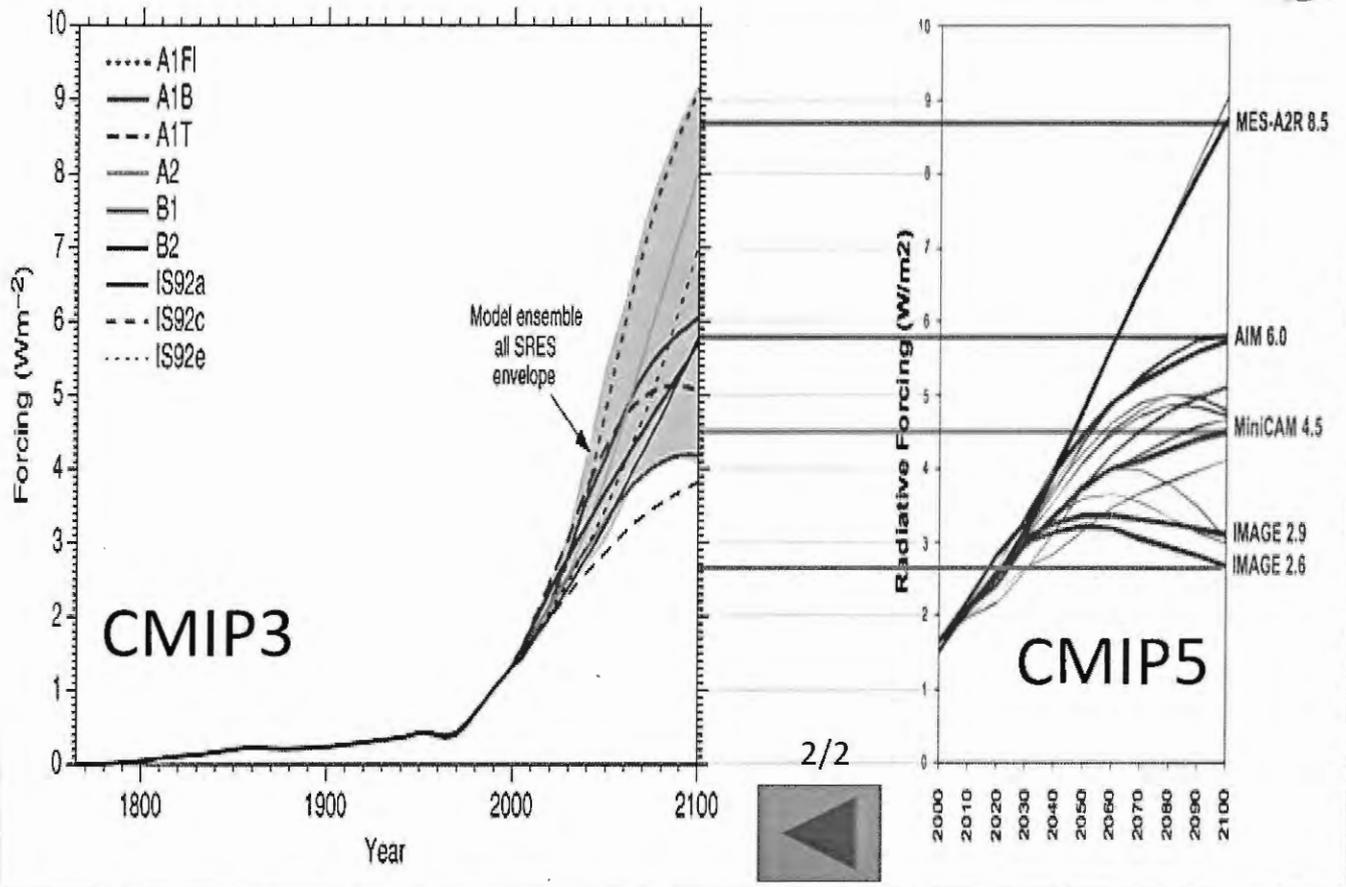
- Sea level rise and saltwater intrusion could pose further yield reduction 
- With (1) 90% of rice export from Vietnam originated from MRD; (2) Singapore's total rice import from Vietnam is about 30%; AND (3) rice yield is expected to reduce by 35% in 2020-2050 → essential information for Singapore's policy makers in their strategic planning (Price increase and Food Security)

Thank You.

TMSI's Climate Downscaling work

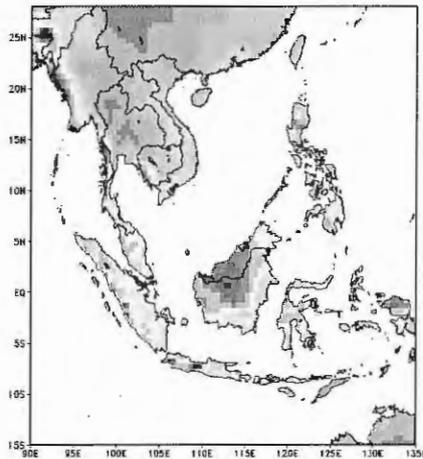


IPCC SCENARIOS: CMIP3 vs CMIP5

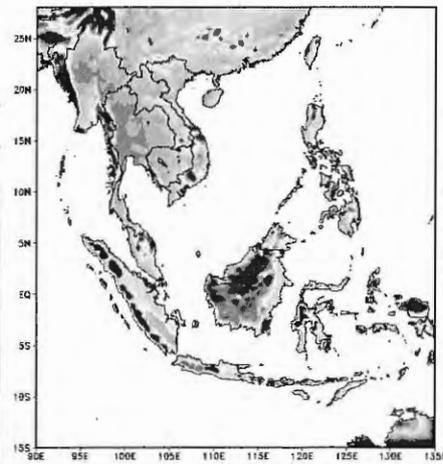


Precipitation (mm/day), 1986-2005

**CRU
Observed**



**WRF/ERA-Interim
Simulated
(20x20km)**



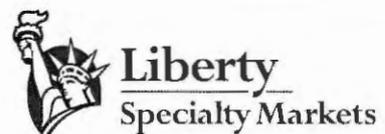
**Topography over
Southeast Asia**



Dynamics of Developing a Weather Index Product: Feasibility, Scalability and Sustainability

Singapore

20/09/2016

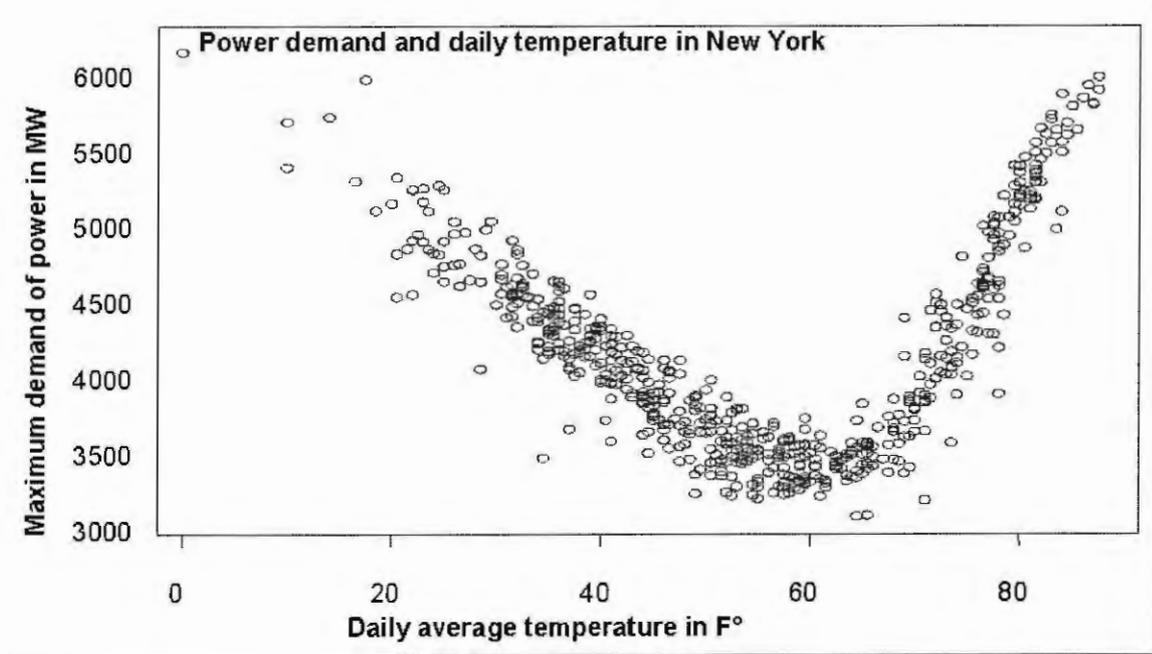


Index Based Cover



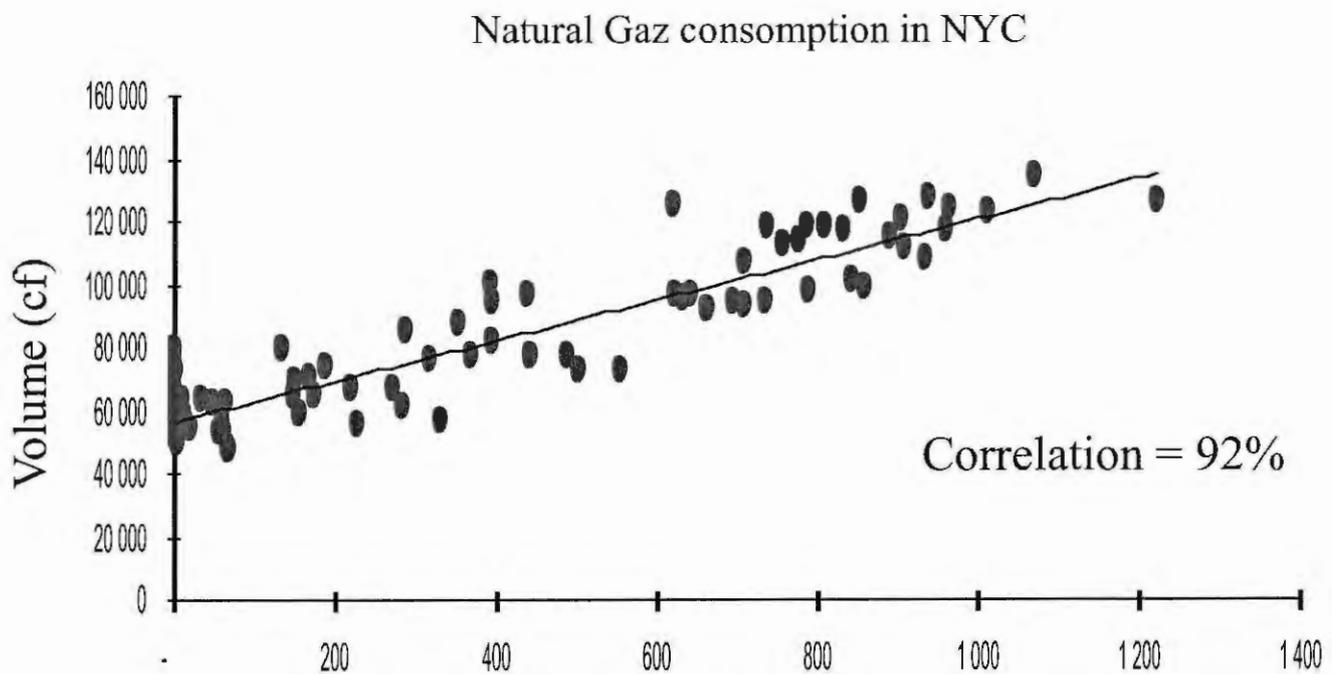
- Origin
- Definition
- Advantages / Challenges
- Weather / Yield / NDVI
- Examples
- Feasibility: start a pilot
- Scalability & Sustainability : grow big and live long
- Latest stories

Index Based Cover Origins: MWh/°F



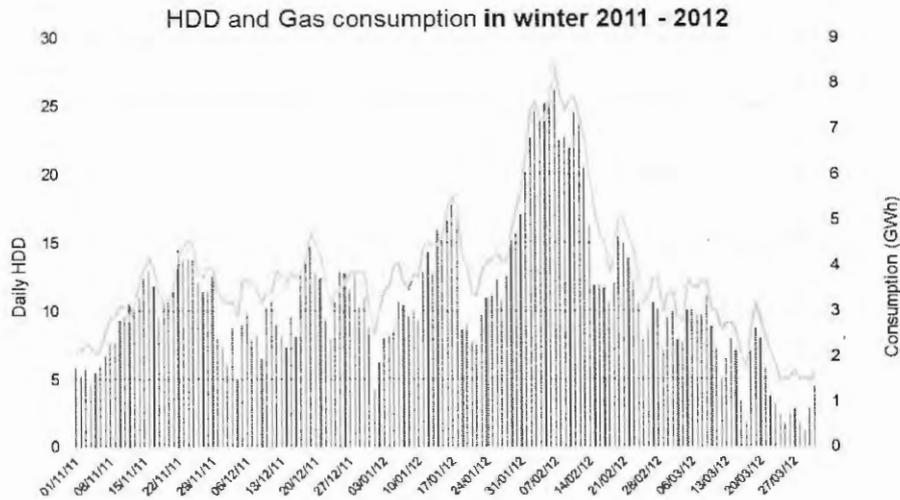
3

Index Based Cover Origins: Gas/HDD



4

Index Based Cover: Gas Volume/T°



HDD INDEX VS. GAS CONSUMPTION (CITY IN EASTERN FRANCE)

CORRELATION = 96%

5

Index Based Cover Definition

➤ Indemnity based cover:

- Material damage and profit loss due to an exceptional event (storm, cyclone, flood...),
- Covered by traditional insurance products with a payment of valued damages.

➤ Index based cover:

- There is a correlation between profits/loss and index variation (which can be normal or extreme),
- Cover which payment is a function of the index variation and doesn't take directly into consideration the material damages.

6

➤ **An index Based policy is defined by:**

- An index and its official source, it can be:
 - Weather index,
 - Yield index,
 - Price index,
 - NDVI index (...).
- A period over which it is built and explains a part or the whole risk
- A payment structure,
- A legal form (Insurance policy, Derivative contract, etc)

7

- Pricing based on historical weather or yield data
- Simplicity of scheme
- No loss adjustment
- No claims management cost
- Objectivity of claim assessment and payment
- Fast payment of claims

8

Index Covers: Challenges

- Basis Risk:
 - Divergence between the index and reality. Relation between yield and weather is complicated and yield is not just about weather
 - Spatial BR.: distance between the farm and the AWS
 - Temporal BR.: sowing date may vary. Vegetative phases lengths may vary as well.
 - Other BR.: loss to disease, wind, wild animals
- Marketing:
 - Insurance is already a hard sell
 - Index based covers are complex, even more so when BR risk is reduced
- Data:
 - Few weather stations

9

Specificity of Weather index

- Underlying:
 - Temperature,
 - Precipitation: rainfall, snowfall,
 - Others: Wind speed (maximum, average, etc...),
 - Combinations.
- Index:
 - Critical day ($T_{min} < 0^{\circ}\text{C}$ for frost),
 - Mean (weighted or not),
 - Cumulative (with threshold or not) as Growing Degree Days,
 - Combinations.

10

Specificity of Weather index

- Understand the risk and link it to weather measures:
 - Type of crop
 - Vegetation cycles by region and crop (main weather perils)
 - Historical yields and claims by region and by crop
 - Weather stations location, data type
 - Needs a close cooperation between farmers, agronomists, climatologists and actuaries

- Structure to provide
 - To cover farmers, coop, State...
 - Level of deductible
 - Premium budget
 - Reinsurance structure

11

Ex : Weather based cover in India

- 65% of Indian agriculture is heavily dependent on natural factors, particularly rainfall i.e. Monsoon
- Rainfall variations explain the main variability in crop yields

Seasonal Distribution of Rains in India

No.	Season	Months	Rainfall Quantum
1	Pre-Monsoon	March - May	10.4%
2	South West Monsoon	June - September	73.4%
3	North East Monsoon	October - December	13.3%
4	Winter Rains	January - February	2.9%

Source: India Meteorological Department (IMD)

Cropped Area Under Various Ranges of Rainfall in India

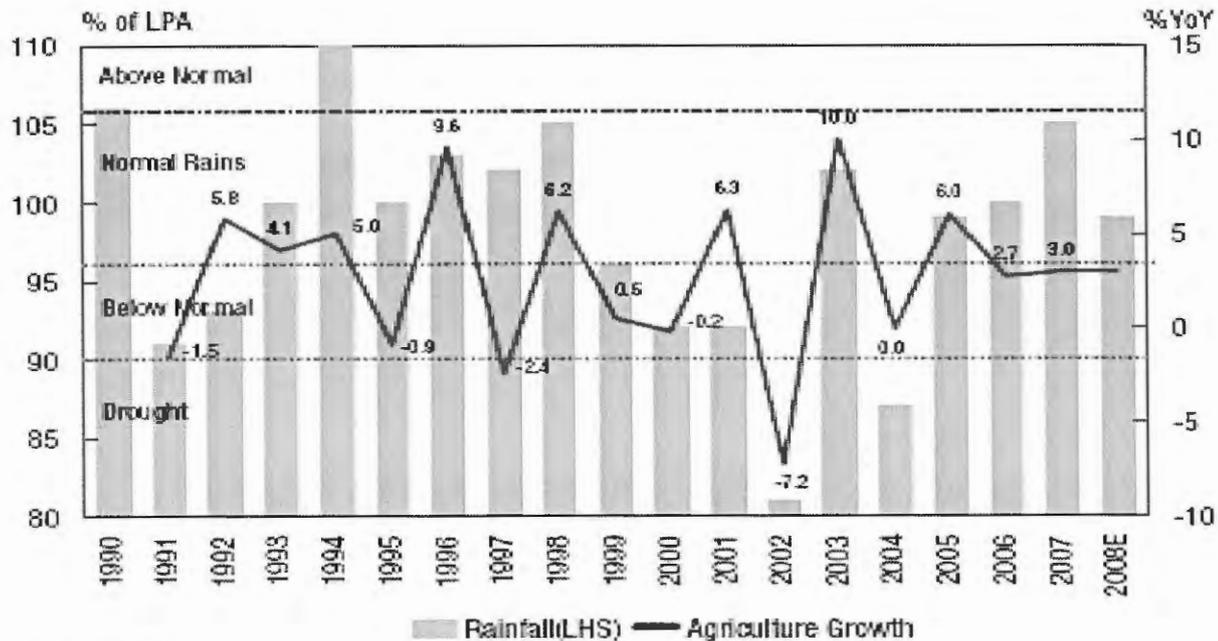
No.	Rainfall Ranges	Classification	Cropped Area
1	< 750 millimeters (mm)	Low Rainfall	33%
2	750 mm - 1125 mm	Medium Rainfall	35%
3	1125 mm - 2000 mm	High Rainfall	24%
4	> 2000 mm	Very High Rainfall	8%

Source: Ministry of Agriculture (Government of India)

12

Ex : Weather based cover in India

Trends in Annual Rainfall and Agriculture Growth (%)



Source: IMD, CSO, Citi Estimates

13

Ex : Weather based cover in India

- Excess and Deficit Rainfall covers
- The crop cycle is divided into a number of phases with specified duration and quantum of rainfall requirement
- Each stage would have its pre-defined Trigger Rainfall against which pay-out would be measured

Biomass Index : NDVI in Mexico

➤ Risk exposure:

- Lack of pasture biomass for cattle feeding
- Index : NDVI, Normalised Difference Vegetation Index,
- This index well correlated with pasture yield
- The risk is a decrease of the NDVI

➤ Solution:

- Macro level index cover
- 60m Ha of pasture and grazing / 5m heads of cattle insured

15

Biomass Index : NDVI in Mexico



16

Index covers: Feasibility

- Adequate Legal environment
 - Specific legal frame for index based insurance.
- Data availability
 - Historical Weather and yield data
 - Functioning WS, data collection processes, etc.
- Delivery channel
 - Banks, Insurance Companies, Cooperatives, etc.
- Risk taker
 - Reinsurance, Funds, etc.

17

Index covers: Scalability & Sustainability

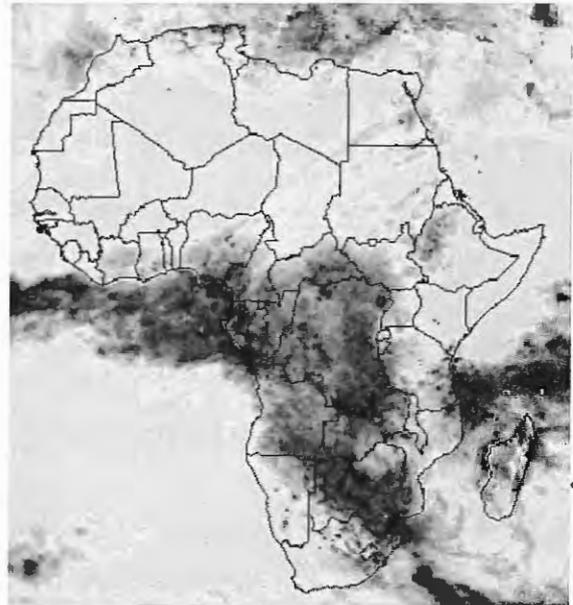
- Public/Private balance:
 - **Nothing big can be done without public support**
 - Direct subsidies, Indirect subsidies: admin fees, free/cheap loss caps
 - Defining the legal and regulatory framework
 - Developing appropriate distribution channels if needed
 - Sharing public data: weather, national statistics, academic data, etc.
 - Facilitating access to international risk-transfer markets
 - **Nothing sustainable can be done outside private sector**
 - Need for sound market-based business principals
 - Marketing, training, adjusting and processing claims, record-keeping, reinsurance, etc.
- Specific crops: grains, extensive pasture.
- Specific perils/phases: Autumn frost on corn, heat stress during filling on wheat.
- Target Aggregators: Cooperatives, Transformers, etc.

18

Index Covers: new sources of data

➤ Satellite data:

- CMORPH : $0.07^{\circ} \times 0.07^{\circ}$ / 30mn
since 2002
- TRMM : $0.25^{\circ} \times 0.25^{\circ}$ / 3h
since 1998
- RFE2 : $0.25^{\circ} \times 0.25^{\circ}$ / 6h
since 2001
- TAMSAT : $0.04^{\circ} \times 0.04^{\circ}$ / 10d
since 1983
- ...



19

Index Covers: New Indices

- FAPAR (Fraction of Absorbed Photosynthetically Active Radiation)
 - Recognised by UN Global Climate Observing System (GCOS)
- VHI (Vegetation Health Index)
- LAI (Leaf Area Index)
- WRSI (Water Requirement Satisfaction Index)
 - Recognised by FAO

20

ARC: African Risk Capacity

- Continental sovereign drought pool
- Jointly developed by the African Union Commission and UN World Food Programme
- Africa Risk View (ARV) is the software application developed to underpin ARC Ltd's index-based drought insurance contracts
- ARV contains three satellite-based rainfall datasets
- Africa Risk View uses FAO's crop model Water Requirement Satisfaction Index, WRSI

21

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Jean Christophe Garaix
Head of Agriculture and Weather

Salah Dhouib
Class Underwriter

Hervé Grenier
Class Underwriter

Françoise Bollotte
Underwriting Support

Abdessamad El Angoudi
Pricing Analyst

Cindy Chapeau
Finance Processing &
Technical Assistant

Lloyd's China
LSM Underwriting Division

Eve Li
Senior Underwriter

Erica Xu
Business Operations
Supervisor

22

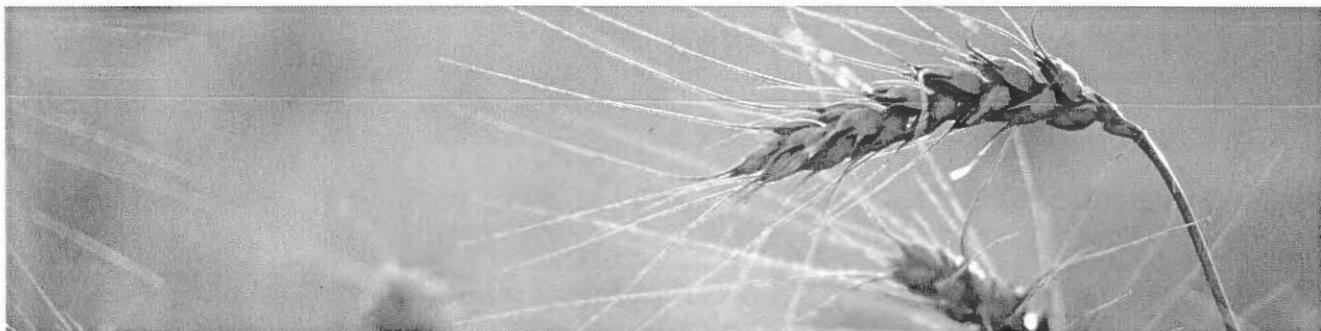
**Welcome Address by Conference Chairman
Stephen Stout, Executive Chairman and CEO, AgRisk Limited, Singapore**

Note: Speech is not available



Agriculture Insurance – Challenges and How to Overcome them

September 2016 | Aon Benfield Agriculture Practice Group



- **Anti Selection**
- **Political Influence**
- **Weather Based Insurance: Challenges**
- **Sales and Premium Subsidy**



Anti-Selection

An efficient distribution system to attain critical mass and ensure spread of risk

Thailand Rice 2011

- Only 2% penetration and only worst farmers bought insurance
 - National average loss cost - 15.6%
 - Insurance Scheme loss cost - 48.6%

- No cut -off date

3

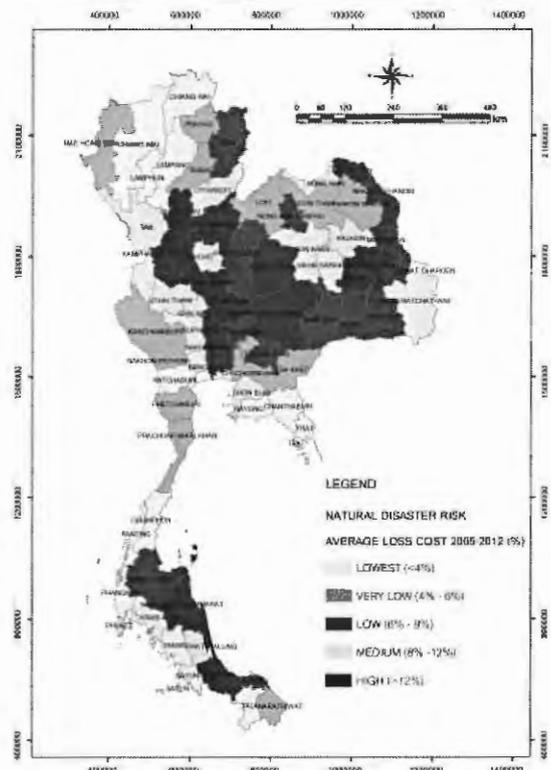


Anti-Selection – Risk-Based Rating

Only way to combat anti-selection was price :
Risk rating was introduced

Rating Zone	Premium	Government Subsidy
Light Green	THB 115	THB 55
Med Green	THB 220	THB 150
Dark Green	THB 330	THB 250
Yellow	THB 420	THB 330
Red	THB 450	THB 350

Scheme was restored to profit despite a 3% penetration rate and loss ratio 4 times greater than national average



4



Anti-Selection/ Cheap Distribution

- India have made it compulsory for all farmers with a bank loan to take insurance.
- This ensures 23% penetration and cheap distribution as banks do all the administration and only pass a bordereau over to insurance companies.
- Thailand has implemented “Compulsory” Crop Insurance Scheme which bring the average loss cost down by 70% and reduces the rate charged to farmers



5

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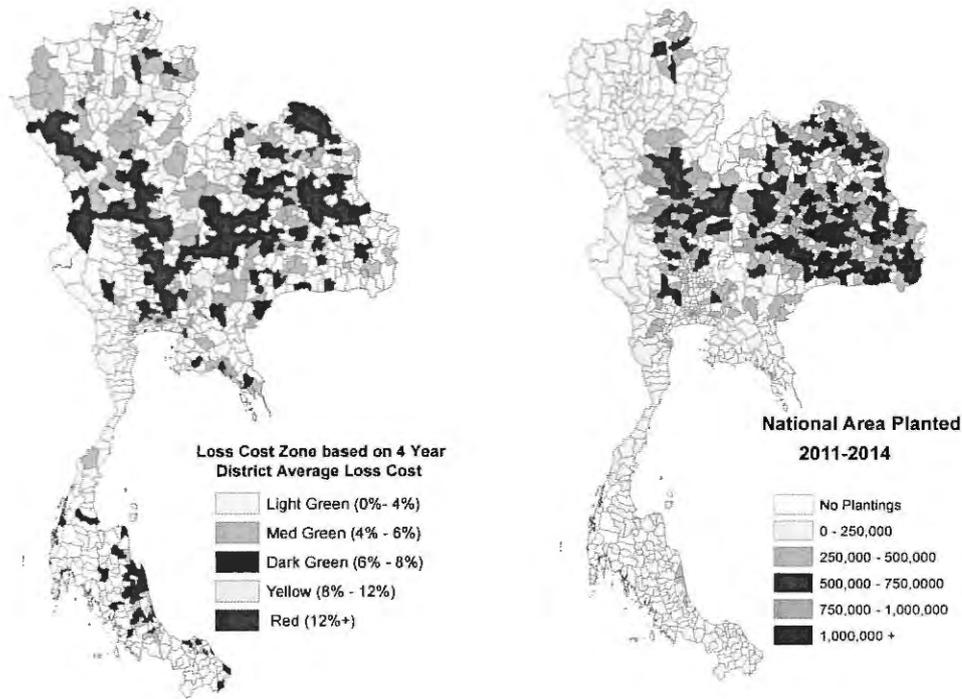
- **Anti Selection**
- **Political Influence**
- **Weather Based Insurance: Challenges**
- **Sales and Premium Subsidy**

6

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Political Influence

Thailand Disaster Declarations



7

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Political Influence

Year	Area Planted	Total Damaged Area	Damaged Area excl Pest	Pest Damage)	Loss Cost
2004	57,651,849	11,950,487	11,782,216	168,271	11,866,352	20.6%
2005	57,773,844	4,595,598	4,551,917	43,681	4,573,757	7.9%
2006	57,541,825	6,308,830	6,105,624	203,206	6,207,227	10.8%
2007	57,385,921	6,028,500	5,999,281	29,219	6,013,891	10.5%
2008	57,422,337	6,974,709	6,830,202	144,507	6,902,456	12.0%
2009	57,497,441	5,208,586	1,584,442	3,624,144	3,396,514	5.9%
2010	57,043,561	8,918,609	7,284,217	1,634,392	8,101,413	14.2%
2011	61,074,780	10,079,838	9,376,732	703,106	9,728,285	15.9%
2012	64,351,828	6,701,779	6,243,755	458,024	6,472,767	10.1%
2013	64,399,540	3,114,833	3,086,363	28,470	3,100,598	4.8%
2014	63,211,789	1,982,488	1,948,840	33,648	1,965,664	3.14%
2015	56,688,379	2,289,495	2,274,176	15,319	2,281,836	4.04%
Total	712,043,094	74,153,752	67,067,765	7,085,987	70,610,760	9.92%

8

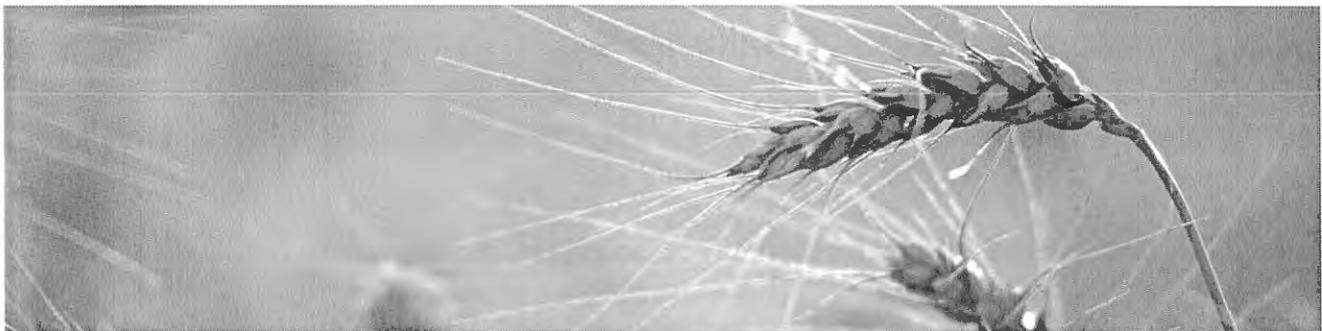
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Political Influence

- Government wants payouts for political gains (but is it in the historical data?)
- Loss Assessment Monitoring

9

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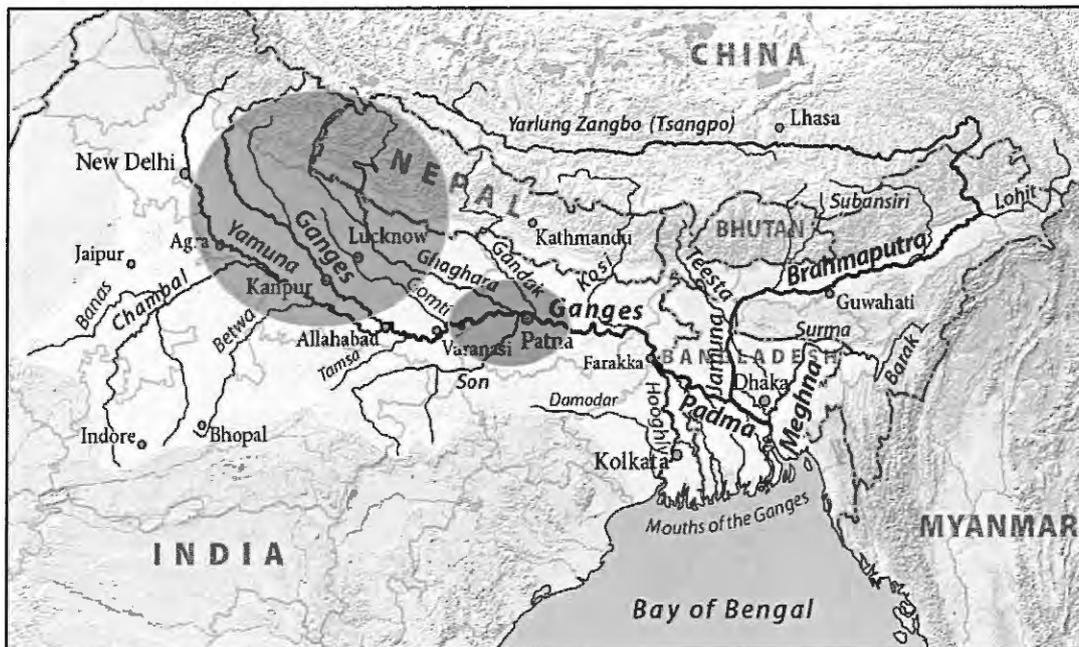
- **Anti Selection**
- **Political Influence**
- **Weather Based Insurance: Challenges**
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10

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Weather Based Insurance: Challenges

- Severe Flooding in Bihar in August 2008. Farms were underwater. However minimal payouts from Weather Insurance as rainfall in the area was normal and flooding came via the Ganges river from excess rainfall further west.



11

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Weather Based Insurance : Challenges

In India, the Weather Based products operate off a daily rainfall reading. However, there are times when the data is not delivered. This can be due to

This problem is addressed in the policy wording. A clause like the below can be used :

Appendix No - 1 MISSING DATA DAY

"Missing data day" means any day during the policy period of an original policy for which the applicable data Provider is unable to measure and/or report weather data in its final and edited form.

Missing Data Day Adjustment to be done in any one of the following methods, whichever is applicable

- Weather data for any missing data day is replaced by weather data of the nearest backup station as reported in the risk report.
- Weather data for any missing data day is replaced by the average during the corresponding missing data day of the immediately preceding years where weather data is available at the missing data day as follows: Temperature and humidity: 10 years; Rainfall: 5 years.

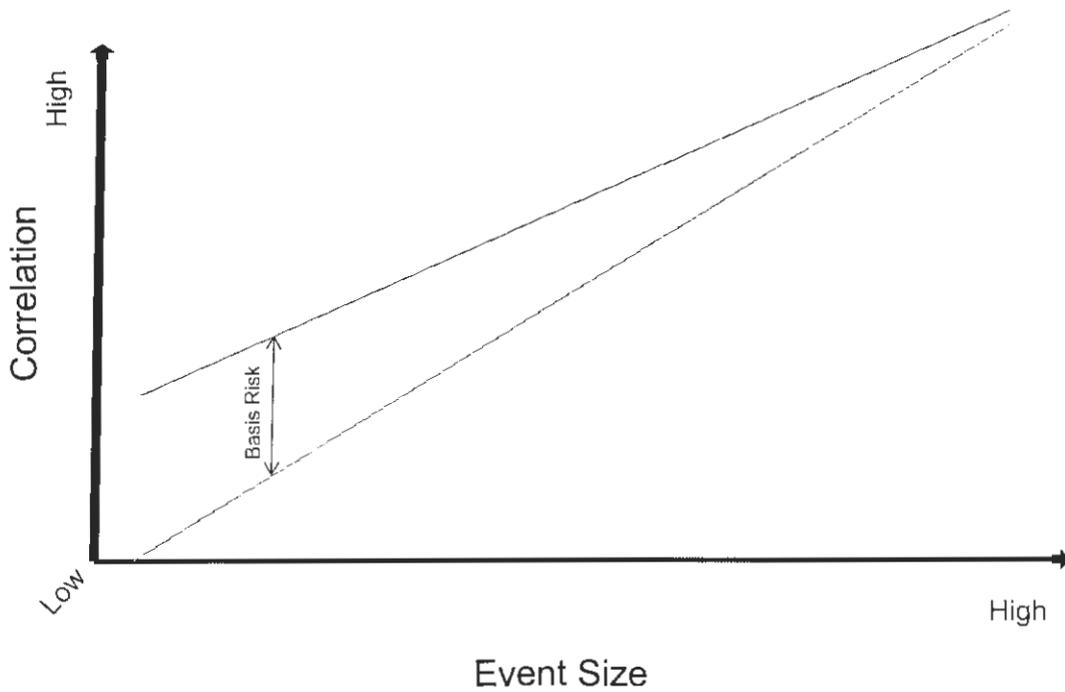
If weather data of the backup station is found missing, then method 2, as outlined above will be applied to calculate missing data. However, if a state government notifies its methodology for filling missing day data the same would be binding for that particular state.

12

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Weather Based Insurance : Challenges

- Governments are gearing the product to payout every three years. Hence the product runs a high basis risk.

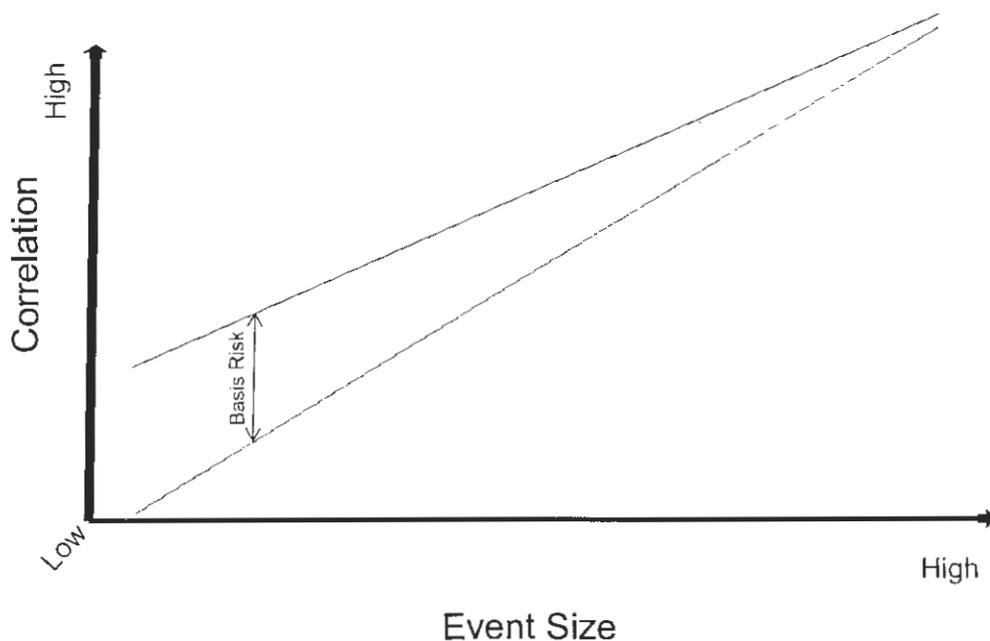


13



Weather Based Insurance : Challenges

- Research findings indicate underpayment for Kharif (rainfall) and over payment for Rabi (temperature)



14



Weather Based Insurance : Challenges

When trying to develop new products, there can be insufficient data. This is normally because the government are looking for a product at a smaller resolution than provided by the data.

This problem has been addressed in three ways :

- Using the historical data of a higher resolution to apply uniformly across the smaller unit areas
- There are programmes that can be used to simulate very incomplete data sets to develop a series of complete historical data sets
- For incomplete data sets, averages can be used to fill in the missing series

15

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- **Anti Selection**
- **Political Influence**
- **Weather Based Insurance: Challenges**
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16

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Sales and Premium Subsidy

All countries with a national crop insurance scheme have the government subsidise the premium, except Australia, Argentina and South Africa

Levels of subsidy differ but in general :

US	70%	85% penetration
Japan	50% subsidy	90% penetration on rice
South Korea	75% subsidy	80% penetration on apples and pears

17



Sales and Premium Subsidy

Heavily subsidised premiums do not guarantee good penetration

Thailand	65% subsidy	3% penetration
Korea	75% subsidy	20% penetration
India	80% subsidy	1% penetration on voluntary basis



18



Special Focus - Impact of Technology in Agriculture Insurance

Panellists will discuss:

- Innovations in Agriculture Technology - Challenges and Opportunities for (Re)insurers
- Satellite/Remote Sensing Technology: How This Mapping Technology Has Changed the Agriculture Insurance Landscape & Latest Development
- How Can Success Stories in Europe Be Adopted in Asia

Moderator: Peter Book, Head of Agriculture, Asia Pacific, Allianz SE Reinsurance Branch Asia Pacific, Singapore

Panellists include:

- Mark Rueegg, CEO, CelsiusPro, Switzerland
- Andrés Lorenzana, Principal Officer, MAPFRE RE Singapore Branch & Labuan Branch

Note: Interactive Q&A session

Agriculture Micro Insurance

A Missing Puzzle in Developing Indonesia's Sustainable Agriculture

Presented By
Teddy Hailamsah
President Director
ACA Insurance - Indonesia



Beautiful scenery of corn field at Dompu - Feb 2016

PISAgro - Objectives

To achieve a target of =

- 20% increase in agricultural productivity,
- 20% increase in farmers' income,
- 20% decrease in greenhouse gas emissions in each decade

PISAgro - Objectives

- On April 20, 2012, PISAgro was formally established and legalized by a public notary → “Kemitraan Pertanian Berkelanjutan Indonesia”
- Nowadays, members of PISAgro are: global and Indonesian companies, international agencies, civil societies, farmers' organizations and government ministries

PISAgro - Vision 20-20-20

20% Yield Increase	20% CO2 Emission Reduction	20% Poverty Reduction
<ul style="list-style-type: none">• Enhance farmers' knowledge in best practice management• Provide access to technology, access to finance• Introduce new, more resilient crop types	<ul style="list-style-type: none">• Sustainable intensification agriculture and efficient use of production inputs• Improve land use of reduce deforestation and peat land degradation	<ul style="list-style-type: none">• Standardize contracting to ensure off-take and prices• Enhance farmers' knowledge in post harvest technique

PISAgro - Integrated Plan

- Establishes working groups (WG) around Indonesia's TEN priority commodities
- A working group on agri-financial has formed to implement innovative finance tools and other risk-sharing approaches across all the value-chains.

PISAgro – TEN commodities

No	Working Group Based on Crop	Lead by Global / Local Private Coy.	Members (Global & Local Private Coy.)
1	Rice	Bayer Indonesia	PT Tiga Pilar Sejahtera (TPS Food), Dow AgroSciences
2	Potato	Indofood	None
3	- Coffee - Dairy	Nestle	IDH (private sector supported by Ministry for Foreign Trade & Development Cooperation, Netherland), DuPont, Yara International (Norwegia), UTZ
4	Palm Oil	Sinar Mas Agro Resources and Technology (SMART)	Indofood, Rabo Bank, IDH Netherland, Louis Dreyfus Company

PISAgro – TEN commodities

No	Working Group Based on Crop	Lead by Global / Local Private Coy.	Members (Global & Local Private Coy.)
5	Corn	Syngenta	Monsanto, Cargill, Department of Foreign Affairs and Trade (DFAT) Australia, Mercy Corps, Bank Andara, Bank Rakyat Indonesia, Vasham, ACA Insurance
6	Soybean	Unilever	Indofood
7	Horticulture	Gunung Sewu Group	DFAT Australia, East-West Seed
8	Agri-Finance	IFC (World Bank Group)	DFAT Australia, Mercy Corps IDH Netherland, Rabo Bank
9	Rubber	Kirana Megatara Group	None
10	Cocoa	Swisscontact	Nestle, Cargill, UTZ
11	Beef	KIBIF Indonesia	None

Corn Working Group

- Since there are **3 seed companies** interested in Corn, therefore the working group divided into **3 sub-WG** in 3 different region : Dompu (West Nusa Tenggara Province), Mojokerto (East Java Province), Amurang (North Sulawesi)
- **ACA** involved in Dompu from Dec 2015 – July 2016 to support the other stakeholders = Syngenta, Mercy Corps Indonesia, Bank Andara and BPR Pesisir Akbar (local Micro Finance Institution), farmers' groups, grain traders (off-takers / buyers)

Roles of Each Stakeholders for Value (1/2)

Stakeholder	Roles
Syngenta	Provide: <ol style="list-style-type: none"> 1. Input supply = corn seed, fertilizer, pesticide 2. Field agronomists deliver the latest technology = <ol style="list-style-type: none"> a. how to plant the seed in different ways (Awali dengan Benar / Start it in a right way) b. how to handle any damage to the corn plant, c. collect farmers' data via mobile phone (GPS based) 3. Claim survey for ACA
Head of Farmers Group	<ol style="list-style-type: none"> 1. Coordinating the farmers to communicate with Syngenta, Micro Finance Institution, Mercy, buyers

Roles of Each Stakeholders for Value (2/2)

Stakeholder	Roles
Micro Finance Institution	<ul style="list-style-type: none">• Farmers' assessment, farmers' data collection, provide loan to small farmers• Insurance premium collection, farmers' data input into system to be forwarded to ACA,• Claim survey for ACA
Mercy Corps	<ul style="list-style-type: none">• Financial literacy, provide printing materials, coordinating all stake holders
ACA	<ul style="list-style-type: none">• Provide insurance coverage

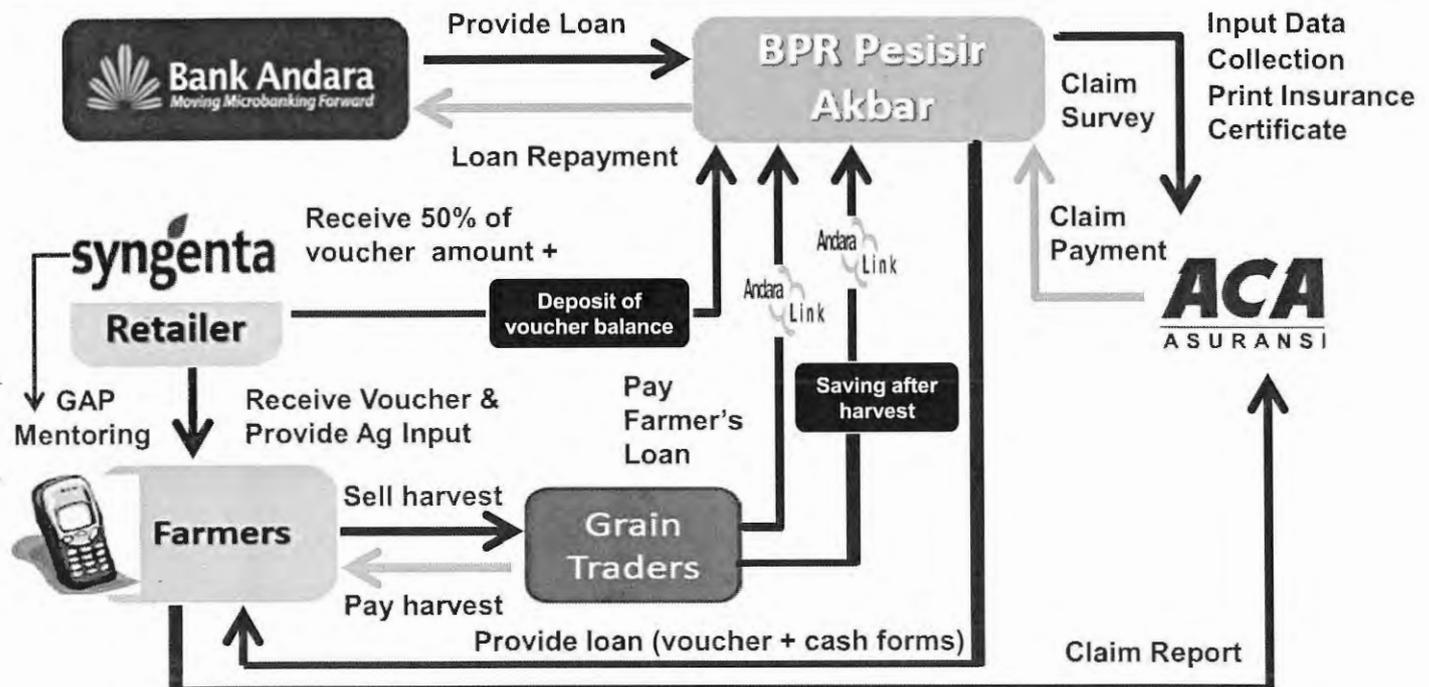
Risk Management in Corn Project - Dompou

Syngenta's agronomists on the field will assist the farmers directly in case of any accident happen to the corn plant. The agronomists will do their best by using their knowledge and technology to prevent the plant from harvest failure → ***this is how the agronomist manage the risk***

- ✓ **For Syngenta** → to provide value chain for farmers and prove to farmers that the seeds have good quality to gain 20% yield increase
- ✓ **For ACA** → a loss control mechanism

Stakeholders in Corn Project Dompu

Bundled Of Loan, Technology/Info, Payment Services & Microinsurance



Corn Insurance Product Profile (1/2)

Aspect	Notes
Type of product	Agriculture Microinsurance – area yield index
Location	Three districts in Sumbawa Island = Bima, Dompu, Sumbawa
Rainy season	Only three months in a year, from mid of November until mid of February
Planting season	Normally mid of November until early of December
Risk covered	Drought or storm / cyclone

Corn Insurance Product Profile (2/2)

Aspect	Notes
Trigger	Min 75% of corn field is damage due to risk covered
Sum insured	USD 600/ hectare with USD 7.5 premium / hectare
Claim payment	Lump sum basis when the trigger is fulfill
Insured	10 farmers groups = 640 farmers
Yield covered	1.201 hectares, spreading in three districts in Sumbawa Island, East Nusa Tenggara Province.

Brochure

PERJANJIAN KREDIT

ASURANSI PERTANIAN GAGAL PANEN

Asuransi Jagung

Santunan
Rp 4.000.000

Iuran (Premi)
Rp 50.000 / Periode Kredit





www.aca.co.id
Hotline 24 Jam : 021 - 31999100
Email : asuransi.mikro@aca.ins.com

PERJANJIAN KREDIT

ASURANSI PERTANIAN GAGAL PANEN

Asuransi Jagung

Asuransi Jagung memberikan santunan Rp 4.000.000, (empat juta rupiah) apabila paling sedikit 75% tanaman jagung miliknya rusak, atau rusak akibat dipanen akibat angin puting beliung, atau mengalami kekeringan, dan tidak masih ada hasil panen yang dapat dijual namun hasil penjualannya lebih kecil dari modal tanam yang telah dikeluarkan Peserta gagal panen.

1. Iuran (premi) asuransi per periode kredit = Rp. 50.000, untuk luas lahan 0,5 hektar setengah hektar.
2. Setiap satu hektar ladang jagung dapat diproses maksimal 2 Asuransi jagung untuk luas lahan 1 hektar.
3. Asuransi jagung berlaku selama periode kredit (3 bulan) mulai berlaku pada pukul 08.00 pada tanggal benih jagung pertama ditanam.
4. Dokumen Keim Asuransi Asuransi:
 - Fotokopi KTP Peserta
 - Asli atau salinan laporan hasil survey lahan yang dibuat oleh pihak surveyor lahan.
 - Dokumen asli yang dikeluarkan BAK, atau instansi berwenang, yang menunjukkan lahan terdapat angin puting beliung atau kekeringan pada lahan yang diwariskan.
 - Jika Peserta meninggal santunan diberikan kepada Ahli Waris Peserta yang dibuktikan dengan dokumen terakhir yaitu asli / fotokopi legalisir Surat Keterangan Meninggal dan Pernyataan Ahli Waris yang dikeluarkan oleh pihak yang berwenang.

Pembayaran santunan maksimal 30 hari kerja setelah elahirnya hasil lengkap

ASURANSI PERTANIAN GAGAL PANEN

Relationship between Climate Change and Claim in Dompou

Climate Change Confused The Farmers

El Nino in 2015 → the effect to corn farmer in Dompou =

- **Normally, rainy season starts from Nov until Feb.** Therefore, farmers always start planting from end of November. However, **El Nino had caused the rain started to drop from mid of Dec.** The local weather station forecasted that the intense rain would start end of Dec or early of Jan.
- This **confusing / uncertainty condition** made most of farmers had decided to start planting mid of December a few days after the first drop of the rainfall. Hoping that the rain would dropped everyday at least until mid of January 2016.

Relationship between Climate Change and Claim in Dompou

Climate Change and Habits of Farmers

El Nino in 2015 → the effect to corn farmer in Dompou =

- Most farmers start planting just **following their feelings and without noticing the weather forecast**, like their ancestor did for years
- In fact, the **planting season has changed** and not all farmers are ready to manage it.
- *Note = farmers in Dompou depend on rainfall to watering the corn seed since there were no irrigation system in the area.*

Relationship between Climate Change and Claim in Dompu

How did the seed failed to grow ?

- The fact = **there were no rain a few days after they plant the seed**. The rain in mid Dec actually was “false rain”. Whilst, **corn seeds need plenty of water at least in 14 consecutive days** to have a normal grow.
- There were **no sign of young shoots growing from the 15 hectares corn field** within one month
- **Farmers called upon the agronomists** to check whether the seed still have a chance to grow. The diagnose was final = **all seeds were fail to grow** → farmers have to **replant the seed and buy 20 kg of seeds / hectare** → extra cost for farmer



Dompu's land are mostly dry on Sept 2015, the rain drops only 4 months annually.



Education of Corn Insurance for Dompu's farmer group in November 2015



Normal Dompu's Corn Field on 25 Feb' 2016



Claim Survey in Dompu – Feb' 2016



The corn seed that was failed to grow due to drought as the impact of El Nino (Climate Change)



The normal corn plant amongst the replanting plant indicates the normal height supposed to be

The replanting corn seed had grown for 21 days

Claim Survey in Dompu – Feb' 2016



The replanting corn in the hilly and rocky areas at Dompu, Sumbawa Island, Nusa Tenggara Province.



The corn plant can grow normal on the rock !

Claim Payment in Dompu – Thursday, 25 Feb 2016



Ceremonial claim payment at the local government officer who was incharge for farmers → at *Kecamatan Sanggar, Kabupaten Dompu*



Claim settlement at the head office of local Micro Finance Institution offices, at Bima city, around 200 kms from Dompu.

Lessons Learned

- Law of **large number** must be fulfilled (50.000 hectares)
- **No government premium subsidy** scheme can work
- **Value chain models** with various stakeholders is one of the ways **to implement risk management** in agriculture micro insurance
- **Local weather station might be asked to join** the program as they can inform weather forecast to the farmer
- **Climate change is real** and give negative impact for farmers

Challenges

1. **How to scale up** the area and the number of farmer groups with the **Value Chain model** to reach **sustainability**
2. **How to change the terms and condition** with affordable price and still **well accepted by the farmers**
3. How to **ensure the farmer to start planting their seeds by following the weather forecast** from the local weather station rather their follow the others who trust on their habits.

Key Factors for Agrifin Phase 3 (1/2)

The next planting = Nov 2016 :

1. **Increase premium per hectare**, i.e. 4 times + OR
2. **Scale up the area coverage** from 640 farmers with **1.200 hectares** of maize into 2.500 farmers with **5.000 hectares** of maize, scattered in 3 districts (Dompu, Bima, Sumbawa).
3. Provide technology for maize with climate resistance seed and **intense treatment from Syngenta's agronomists** → *risk control*
4. **Educate the farmers to use weather forecast** as a guidance on when to start planting → *risk control*

Key Factors for Agrifin Phase 3 (2/2)

4. Ask **local weather station to joint the project** → release the rainfall forecast to be used by the farmers to start planting their corn seeds.
5. **Field data collection** by using **mobile phone based on GPS**, including details of insured corn field → supported by 8villages (IT solution company)
6. **Inclusive education and socialization** campaign to all farmers in this Agrifin Phase 3 project in 3 districts.

Next Dompu Project

Aspect	Notes
Type of product	Agriculture Microinsurance – area yield index
Location	Three districts in Sumbawa Island = Bima, Dompu, Sumbawa
Project start	Nov 2016 – May 2017
Risk covered	Drought or storm / cyclone
Trigger	Min 75% of corn field is damage due to risk covered
Sum insured	USD 600 / hectare, premium USD 30 / hectare
Claim payment	Lump sum basis when the trigger is fulfill
Target insured	2.500 farmers = 5.000 hectares

Other Agriculture Microinsurance Projects

Crop	Stakeholders	Status	Location
Cocoa	<ol style="list-style-type: none"> 1. Swiss Contact 2. Syngenta Foundation 3. IFAD (International Fund for Agriculture Development) 4. ADB (Asian Development Bank) 	Preparation for dry run in Nov 2016 – Feb 2017	<ul style="list-style-type: none"> • West Sulawesi • South East Sulawesi

Other Agriculture Microinsurance Projects

Crop	Stakeholders	Status	Location
Rice	<ul style="list-style-type: none">• Sompo Japan Indonesia,• Mercy Corps Indonesia	Preparation for dry run in Nov 2016 – Feb 2017	<ul style="list-style-type: none">• East Java• West Nusa Tenggara
Coffee	<ul style="list-style-type: none">• Syngenta Foundation• IFAD• ADB• Olam International• Bank Andara	Preparation for dry run in Nov 2016 – Feb 2017	<ul style="list-style-type: none">• West Java• Sulawesi• Aceh• East Nusa Tenggara

Thank You



Scenic view of Dompu