



# Proceedings of the Symposium on Disaster Risk Management

June 16-19, 2010  
Jolly Beach, Antigua



**Proceedings of the  
Symposium on Disaster Risk Management  
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## PREFACE

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The Symposium on Disaster Risk Management was held in Antigua from June 16-19, 2010. This symposium brought together a total of 107 producers, public and private personnel and policy makers and donor agencies in the planning and development of a sustainable disaster risk management strategy and an agricultural insurance scheme for the Caribbean region. The event provided an excellent opportunity for interaction among the stakeholders in the agricultural and insurance sectors as well as an opportunity to build capacities and expand knowledge on these issues.

IICA is pleased to be associated with this publication which represents the proceedings of the symposium, with a view to sharing the presentations, discussions and recommendations to as wide an audience as possible. It is hoped that this publication can form the basis for enhanced knowledge of and information on the various initiatives – both global and regional – as they relate to the development of disaster risk management strategies for the agriculture sector in the Caribbean.

The Institute wishes to express its gratitude to The World Bank for its financial support in the production of the publication.

The proceedings is divided into 11 sessions as reflective of the programme held over the three days of the symposium:

- Session 1: Agricultural Risk Management in the Caribbean: Public Sector Perspective
- Session 2: Public Sector Strategies in Managing Risk
- Session 3: Public Sector and Enabling Conditions for Agricultural Risk Financing
- Session 4: Private Sector Strategies in Managing Risks
- Session 5: Producers' Experiences in Agricultural Insurance
- Session 6: Plenary Debate on Private sector strategies
- Session 7: Producer Organisation Strategies in Managing Risks in Caribbean Agriculture
- Session 8: Towards a Regional Risk Management Strategy
- Session 9 & 10: Government response and Commitments: Where do we go from here and how?
- Session 11: Closing Remarks

The contributions recorded herein provide a mix of both full presentations and summaries of work presented. In this regard, we wish to acknowledge the contribution of Mr. Kervin Stephenson, Specialist in Projects, IICA, Caribbean region, for the role he played in pulling together the papers and presentations for inclusion in the proceedings. We also wish to acknowledge the contribution of staff from the IICA Offices in Saint Lucia and Trinidad and Tobago who also contributed to the preparation of the proceedings.

A list of all of the agencies that provided financial and technical support to the successful staging of the symposium is provided at the end of the proceedings. A list of the participants is also provided.

It is the hope of IICA that these proceedings will assist the region in dealing with the issues confronting the development of the agriculture sector, as they relate to disaster risk management and to resolving the issues concerning the development of insurance schemes for agriculture.

## INTRODUCTION

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Agriculture in the Caribbean region was responsible for closely 5% of GDP on average in 2009, with significant differences among countries, fluctuating from 1% in various Caribbean Island states to some 20% or more in countries such as Haiti (20.3%) and Guyana (30.2%). Agriculture is also an important sector for generating jobs and income in rural areas, especially among the poor. The percentage of persons working in agriculture fluctuates between less than 10% of total employment, as in the case of the Bahamas, and over 30% in countries such as Haiti; Dominica and Guyana. In addition, the real contribution of the broadly defined agricultural sector is greater than what is shown in the national accounts, which only records the value added of the primary phases of production. The role of agriculture and the rural sector as generators of employment and engines of growth is essential, particularly during recessions. However, at the present time, the capacity of agriculture and the rural environment to mitigate the negative impact of the economic crisis and contribute to recovery is limited by the low levels of investment in it for at least the past two decades.

The absence of a sufficiently coordinated framework for disaster risk management at the national and regional level largely contributes to the limited investment in agricultural production and marketing. In fact, the lack of adequate risk mitigation measures such as agricultural insurance is identified as one of the major binding constraints limiting investment to develop competitive and sustainable agriculture in the region.

### Background

Risk mitigation measures in the Caribbean for agricultural activities can be categorized as severely inadequate and the traditional risk management strategies which have included the use of savings, accessing loans, crop diversification, use of drought resistance-low yielding cultivars and species, and provision of relief by Governments in the face of disasters have proven to be neither robust nor efficient in preventing serious economic loss and allowing speedy recovery. The public expenditure on catastrophic disasters generally requires enormous administrative cost while addressing only a portion of the losses incurred and often involving tremendous long periods of waiting and very often, inefficiency in its execution which most frequently results in significant loss of confidence and motivation by the agricultural community.

Despite costly inefficient and ineffective reconstruction processes in the Caribbean for catastrophic events, there has been limited concerted effort in the Caribbean region to develop a comprehensive programme of insurance for the agricultural sector, which remains heavily vulnerable in the aftermath of a disaster event or to mitigate future disasters, ranks the Caribbean among the top 10 of the Disaster-Proneness Index of the relative hazardousness of nations (UNEP 1993). In addition, large potential fiscal liabilities are incurred if natural catastrophes were to disable the assets. The history of Agricultural insurance as a risk transfer mechanism in the Caribbean Region is limited to sub regional efforts in banana insurance administered through Windward Island Crop Insurance (WINCROP), and country efforts as in Jamaica for coffee, bananas and coconut. In addition to the high administrative costs of multiple peril crop insurance, the recent erosion in economies of scale for traditional exports has led to the decline in existing schemes in the Caribbean.

In recent years, agricultural insurance has re-emerged as a topic of interest to governments and other policy makers; insurance companies and development finance institutions; and producer organisations and rural residents after a long hiatus in the Caribbean. A number of factors are responsible for this renewed interest and include the following: vulnerability of the Caribbean to increasingly volatile and extreme weather patterns as a result of climate change leading to an increase in frequency and costliness of natural disasters ; removal of preferential access for EU markets and the fluctuations in international commodity prices has increased the need to urgently enhance the agricultural competitiveness in the region to facilitate economic and financial stability, urgency to enhance food security both nationally and regionally, the potential reduction in administrative

expenses due to the promising advances in information and communication technologies (ICT's), remote sensing technologies, connectivity and computing power, telecommunications and probabilistic risk modeling techniques, has encouraged the private sector to rethink their strategy to agricultural insurance; the potential to reduce poverty and improve incomes of rural communities by the promotion, development and establishment of sustainable risk transfer instruments such as agricultural insurance to reduce economic shocks has been established globally, and can significantly transform and reposition agriculture in the Caribbean.

The countries of the Caribbean Region are now giving serious consideration to the introduction of insurance products as a risk transfer mechanism within the agricultural sector, however, the limited technical capacity of trained policy makers, policy advisors, public technicians, private insurance companies, development banks and producer organisations in planning, developing, implementing and monitoring risk mitigation measures for agricultural production and marketing has significantly impacted on the establishment of sustainable and profitable disaster risk management schemes in the Caribbean. In addition, the structural heterogeneity, both among and within countries in the Caribbean reflects different policy needs and expectations and raises significant challenges in administration including finance and legislation and in governance of agricultural institutions across the region. This diversity also reflects the challenges in the integration of small producers into already established productive and commercial chains; and in the promotion of public-private alliances to encourage coordination.

In 2007, Ministers of the Caribbean gave IICA a mandate to develop Disaster Risk Mitigation measures for the agriculture sector. This was seen as pivotal in not only creating awareness of the dire need for a feasible and practical disaster risk mitigation protocols specifically for the agriculture sector, but more importantly to increase the capacity of policy makers and stakeholders to resolve the major issues concerning the development of a regional agricultural insurance scheme. Consequently, there is an urgent need to immediately enhance the knowledge and skills of stakeholders directly involved in decision making for agriculture related activities at both public and private sector through education in disaster risk management in the Caribbean. This will facilitate the agriculture sector to continue to contribute in a positive and significant way in the economic and social development of the region. Additionally, a concerted effort must be made to build a cadre of policy advisors, private insurance and producer organisations personnel in identifying elements of good disaster management practices to address challenges being faced by stakeholders in the agriculture sector.

The hosting of a regional symposium was to contribute immensely to alleviating these institutional challenges by building the technical capacity of producers, public and private personnel and policy technicians in the planning, development and management of agricultural insurance schemes for the agriculture sector in the Caribbean region.

### **Problem**

All member states in the Caribbean region have been incapable of sustaining and maintaining profitable and effective disaster risk management schemes. This has been as a result of inadequate legislation and financial resources; limited management knowledge and skills in leadership and administration of agricultural insurance schemes in areas such as data and information management. In addition the inadequate knowledge of producers, producer organisations and private insurance companies in agricultural risk financing and assessment have limited their ability to participate in agricultural insurance schemes, which has been further compounded by the inadequate number of public technicians, policy makers and development bank technicians that are trained and educated in agricultural insurance. The limited coordination among countries has also contributed to the inadequate development of risk mitigation measures to the Caribbean agricultural sector.

### General objective of establishing disaster risk mitigation measures for the agriculture sector

The symposium would contribute to the enhancement of agricultural production and productivity, food and nutrition security, and prosperity of rural communities by the introduction and dissemination of good disaster risk management practices for the Caribbean agriculture sector through the integration of the Jagdeo Initiative constraint of inadequate risk mitigation and the CDEMA led Comprehensive Disaster Management (CDM) Strategy for optimizing agricultural insurance schemes in the Caribbean region.

### Specific Objectives of the Symposium:

1. To strengthen the capacity of policy makers and technicians, development bankers, private insurance technicians and producers in the planning, innovation, development and management of a sustainable agricultural insurance scheme for the Caribbean region
2. To bring key stakeholders in the sector together to evaluate the challenges faced (e.g. policy, legislative, information, infrastructural), and the opportunities available (management tools, including insurance) for addressing the risks and to
3. To determine the main tenets of an overarching agricultural sector risk management strategy for the Caribbean with a focus on Agricultural Insurance.

### Outcomes:

By the end of the Symposium, capacity and knowledge would have been enhanced:

- (i) By policy advisors and policy makers to facilitate legislation and regulation;
- (ii) By private insurance and development bankers in methodologies for risk layering, risk identification, risk quantification and risk modeling for establishing agricultural insurance tools that could be introduced to manage the risks existing in Caribbean agriculture;
- (iii) By public technicians to facilitate the leadership and administration of a modern agricultural insurance system;
- (iv) By producers and producer organisations to commit to ethical practices including reporting and enforcement as it pertains to agricultural insurance;
- (v) By the public and media of information on the principles of sustainable disaster risk management for the Caribbean.
- (vi) By private, public and producer on interaction among the different public sector entities and between these entities and the private and agricultural community.

### Organisation, management and participation:

One Hundred and seven (107) participants benefitted from actively participating at the Symposium.

- **Institutional support:** 37 staff members from 8 institutions: 6 staff from the Ministry of Agriculture in Antigua and Barbuda; regional and international institutions (IICA – 14; CDEMA – 3; FAO – 5; CDB – 2; World Bank – 5; CARICOM – 1; and CARDI – 1), provided technical and administrative support in the organisation and management of the symposium.
- **Technical assistance:** 8 technicians from regional and international institutions (CCRIF; CIMH; Oxfam; WINCROP; GIIF; CABA; CAFAN and the IDB).
- **Enhanced capacities:** 58 Participants, including 3 Ministers of Agriculture from the OECS region; 18 policy makers and technicians; 18 development bankers and private insurance technicians and 22 producers represented producer organisations in the Caribbean.
- **Media and communications coverage:** 4 technicians: IICA -1; CARICOM – 1; Caribbean Media Corporation (CMC) – 1; and Ministry of Agriculture Antigua – 1.

## OPENING CEREMONY

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## WELCOME AND OPENING REMARKS

**Mr. Clarence Pilgrim**

Permanent Secretary, Ministry of Agriculture, Lands, Housing and the Environment, Antigua

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It is with great pleasure that I welcome everyone to the State of Antigua and Barbuda to this important regional symposium which highlights one of the key Binding Constraints to the Agricultural Sector in the Caribbean Community.

Our focus over the next 3 days will be on creating a sufficiently coordinated framework for disaster risk management at the national and regional level that will help to contribute to greater investments in agricultural production and marketing.

This symposium is in keeping with the objectives of the Community, identified in Article 6 of the revised treaty, which includes: the improvement of standards of living and work; the full employment of labour and other factors of production; accelerated, coordinated and sustained economic development and convergence.

I wish to urge all attendees to take a moment of reflection together with me on where we are in our national efforts, and visualise the success of this symposium in the quality of its expected output, which will be on a regional scale.

Respected colleagues, not only do we have present within this suitably named Hibiscus Room, the potential for thoughts to blossom and our ideas to flow with an aroma of clarity and precision, I am confident that the seeds of determination and purpose, will guide us to the right questions and ultimately the right answers.

Indeed, this welcome to you comes from the hearts and souls of the many committed and dedicated individuals, who have worked to make this first in its kind meeting a reality.

We urge you as policymakers you must not forget that our task is to create the environment for what we deliberate here, to happen.

Remember, our tomorrow starts today with the role of agriculture and the rural sector being significant generators of employment and engines of growth in the Caribbean.

Ladies and Gentlemen, I wish you a pleasant stay in the State of Antigua and Barbuda. Please enjoy the beauty and the diversity of the culture of this country which is another gem in the Caribbean necklace of states.

Thank you.

## REMARKS

### Ms. Elizabeth Riley

Deputy Chief Executive Officer, Caribbean Disaster Emergency Management Agency (CDEMA)

---

Good evening, it is a pleasure to be here in Antigua and Barbuda and an even greater pleasure to deliver brief remarks at this opening ceremony of the Caribbean Regional Symposium on Agriculture Insurance.

Ladies and gentlemen, we in the Caribbean know the reality of living with risk. The plethora of traditional hazards which we face – natural and man-made, including floods, drought, hurricanes and other tropical systems, landslides, earthquakes, fires – and the list goes on - has been further compounded by trans-boundary threats. The latter, inclusive of climate change and its potential implications, biological threats, in the case of the agricultural sector such as foot and mouth disease, have necessitated us to urgently revisit the way we do business as sectors, as sovereign states and as a region.

Our risk experience has taught us harsh lessons of how hard fought developmental progress is reversed by just one event. From Hurricane David in 1979 to the drought of 2009/2010, three decades of repeated losses have resulted in damage to the estimated value of between US\$700Million and 3.3 Billion dollars in direct and indirect costs from extreme weather events alone (IDB). These losses have affected our productive sectors and livelihoods have brought us to the necessary position that managing risk is a development issue and demands from us as policy makers the reflection of this position in our decision making, national policies and programmes.

Complicating the landscape is the phenomena of climate change and its potential implications for increasing both the frequency and intensity of the hydro-meteorological hazards with which we are all familiar. CDEMA's position on this is clear. Disaster risk management must be viewed as the launching pad for engaging our sector partners in dialogue on the consequences of climate change and for undertaking associated adaptation actions. Within our agricultural communities, the realities of current day climate variability provides a much needed entry point for making the link to sustainability of current livelihoods, and it also provides a mechanism for generating the buy-in necessary for full participation. The 2009 – 2010 drought is one such example.

The reality of non-traditional threats also demands that we step outside of our comfort zones to engage in interactions with varied actors on dynamic issues. This week's symposium is a tangible demonstration of this evolution where scientists, insurance partners, disaster managers and agricultural practitioners have come together to seek common solutions to challenges which transcend our disciplines. It therefore requires a revisit of national and regional governance arrangements to meet these dynamic needs. Arrangements which allow us to collectively harness expertise and knowledge to advance disaster risk management.

This symposium comes at a juncture where CDEMA has been operating under its expanded Comprehensive Disaster Management mandate (CDM) for a mere ten months. CDM challenges us to give consideration to all hazards, empower all sectors and build a culture of safety. The mainstreaming of disaster risk management at the sectoral level is one of the priority outcome areas of the regional CDM strategy. A strategy which has been broadly embraced at the national level within the CDEMA Participating States and at the regional level through adoption at the level of the CARICOM Council for Trade and Economic Development - COTED.

CDM and its associated governance mechanism which embraces the concept of sector led disaster risk management mainstreaming is pioneering and offers a structure within which these complex interactions can take place. Our collective efforts in mainstreaming disaster risk management into the agricultural sector through the vehicle of the regional Jagdeo initiative is a tangible demonstration of the CDM philosophy of sector led mainstreaming and sector empowerment to achieve the CDM objectives. This arrangement gives our work an institutional root within the priorities of the Caribbean Community. Through this partnership, we have worked together to elaborate a work programme and with the support of the Food and Agriculture Organisation, CDEMA is

undertaking a study on praedial larceny which will shortly deliver concrete recommendations for alleviating this constraint.

In this regard, CDEMA wishes to thank the Government of Antigua and Barbuda through the Honourable Hilson Baptiste for his sterling leadership of this joint initiative over the past year. Minister, we consider you a true champion of our cause.

As we dialogue over the next three days, the importance of finding solutions for risk transfer options in the agricultural sector is real. We must keep in perspective the restricted hazards scope and specific triggers associated with other transfer mechanisms such as the CCRIF and not be lulled into a false sense of security. In addition, however, we must be ever mindful that that risk transfer (inclusive of agricultural risk insurance) is but one within the suite of options for the agricultural sector. Our national level policies and programmes must also integrate broader hazard mitigation measures which reflect a shift in our approach – It is NOT business as usual.

Let me express appreciation to the Government of Australia, through AUS AID who have provided the resources which enabled CDEMA to offer support to 15 participants at this symposium. That these participants have been selected from farmers associations across the region is strategic, since within CDM, building community resilience starts at the ground level. For the agricultural sector, the farming community is key to creating that ground swell of awareness which propels pressure for change. Our expectations of you are therefore high and we anticipate that you will be advocates for change within your spheres of influence.

Let me close by inviting you to join me in expressing our deepest appreciation to the Government of Antigua and Barbuda for its hosting and logistical support for this Conference. In addition we wish to thank our co-organizers of the event, the Inter-American Institute for Cooperation on Agriculture (IICA), the Food and Agriculture Organisation of the United Nations (FAO), the Caribbean Development Bank (CDB) the Caribbean Agricultural Research and Development Institute (CARDI); the CARICOM Secretariat and the World Bank, who have worked to ensure that this event has come to fruition. CDEMA pledges its continued commitment to working side-by-side our agriculture sector partners in support of the Jagdeo Initiative and to empowering this sector to drive the mainstreaming process. We at CDEMA are confident that this symposium's outcomes which will demonstrate that we are not about business as usual.

I thank you.



## REMARKS

### Mr. Bruce Lauckner

Head, Strategic Alliances, Caribbean Agricultural Research (CARDI)

---

Ministers, President of the Senate, ladies and gentlemen.

First let me apologise for the absence of Dr Arlington Chesney, Executive Director of CARDI who has a number of other engagements, not least being the opening in Trinidad and Tobago of the new parliament with a new government. As CARDI's Headquarters is in Trinidad and Tobago, our Executive Director should and must attend this parliament opening.

Dr Chesney was particularly disappointed not to be here as he has been closely following the activities of TMAC which has been very active and has certainly made significant progress in its work as mandated by COTED. In fact, I might even say that TMAC has made progress to date beyond what might have been expected

This can be attributed, of course, to the guidance of CDEMA and the other members of the core committee of TMAC, but we must highlight the very significant contributions of the Government of Antigua and Barbuda, specifically Minister Baptiste and his team. Minister Baptiste has personally taken charge of this process and insisted that everyone else match his level of performance and meet their commitments. Sir, you have also indicated what your action might be if we fall back in any way; but I can assure everyone that this has been no threat, but rather an encouragement as CARDI (in common with all TMAC members) strives to get things done and does not enjoy being delayed by bureaucratic and other hurdles.

From this you can gather that CARDI is really pleased to be deeply involved in this process. Our work programme, which was developed out of our current Medium Term Plan, includes many activities closely tied to managing the risks which our farmers have to take.

We are very conscious of the potential effects of climate change on our agricultural sector. Thus our varietal search and selection has, at the forefront, varieties and species which are tolerant to events such as droughts, floods, high temperatures and pest and diseases. If farmers use varieties and species tolerant to adverse conditions, then the risk of crop failure is reduced and this will, in turn, mean that insurance agencies will be more comfortable in offering protection to them.

An increase in the numbers and types of pest and diseases caused by invasive species is another probable effect of climate change. CARDI is in the forefront of this battle as we chair the Caribbean Invasive Species Working Group.

While on the topic of climate change, I will mention that we are working with agencies such as Caribbean Community Climate Change Centre (CCCCC) and Caribbean Institute of Metrology and Hydrology (CIMH) to try to develop some better models of the likely changes and the implications for agriculture.

One thing we are certain of is that disasters will continue to occur and from all predictions at more frequent intervals. Therefore we are intensifying our efforts to have in place seeds and seedling banks, to ensure quick post disaster recovery. This will allow farmer income to quickly restart after the disasters; among other things this will ensure that there will be no gaps in ability to pay the insurance premiums as they become due.

At present we have seed production and storage facilities in Belize and here in Antigua and Barbuda. By the end of 2011, thanks to projects funded by Common Fund for Commodities (CFC) and the European Union (EU), we will have seedling production capacity in St Vincent and the Grenadines, Barbados, Dominica, Jamaica and Trinidad and Tobago.

CARDI also considers protected (undercover agriculture) as a very important weapon in the fight against unfavourable climate conditions. The structures of protected agriculture help to manage the effects of climate change. Our research on protected agriculture systems will include identifying the structures which can be easily and quickly dismantled and then quickly rebuilt before and after the passage of a damaging storm.

I acknowledge the presence of the representatives of the World Bank, who are bringing their knowledge to this meeting. World Bank has done a lot of relevant work in the Caribbean as part of an EU initiative, the All Agricultural Commodities Programme which is being executed in Africa, the Caribbean and the Pacific. CARDI is the Caribbean Focal Point for this programme and we must try to ensure that the work done by the World Bank and other international agencies in this EU project is known in the region and integrated into efforts such as the CARICOM Disaster Management initiatives.

Let me emphasize that the farmers are at the centre of everything. I know that my colleague from CAFAN, Mr Jethro Greene has gathered the views of his members on how to reduce risk, what are the risk factors and what kind of insurance is needed. I am sure that our insurance companies already know that we must listen to the clients; the rest of us should also not forget this.

We must remember that insurance companies are not charities, and they are wary of accepting great risks. Therefore we must look for region wide schemes; when disasters strike in the region they usually strike in one place and not every country in the region. Therefore having a regional scheme will help to spread the risk and that is why the regional farmers group CAFAN has a very important role to play in getting insurance for farmers in place.

Minister Baptiste, I reiterate that CARDI is very pleased to be associated with this work; as usual your hospitality from the moment we stepped off our flights, has been 110% of the best that can be given. I thank you and your very pleasant helpers. CARDI is pleased and proud to be here and will continue to work with you.

## REMARKS

### Dr. Warren Smith

Director of Finance and Planning, Caribbean Development Bank (CDB)

---

Thank you very much Chairman.

Honourable Hilson Baptiste, Minister of Agriculture Housing Lands and the Environment of Antigua and Barbuda; Hon. Minister of Agriculture from Dominica; other distinguished Ladies and Gentlemen; colleagues of the head table.

Let me start out by saying on a personal note, how wonderful it is to be back in Antigua and Barbuda. As the plane landed here this afternoon, I remembered the six wonderful years that I spent in this country, in a completely different occupation; completely different environment concerning myself about the aviation business. Its nice to be here this afternoon speaking about Agriculture and Disaster Risk Management’.

When I joined the Caribbean Development Bank briefly for two (2) years in 1985, I recall that that regional institution had a division which was called ‘Agriculture’. It was replete with professionals focusing on different areas of expertise in the field of agriculture. When I returned to the CDB in 1998, the CDB had one (1) professional staff member covering the agriculture portfolio. I’ll return to that issue tomorrow when I have the opportunity to speak to you on the topic.

I am please to say that the renaissance in agriculture that we are beginning to see across the Caribbean, is very much experiencing a renaissance within the CDB itself. There is a much greater consciousness of the need for the bank as the premier regional financial institution to associate itself with the aspirations of the Caribbean people to renew the agriculture sector which play such a critical role in addressing poverty in so many of our countries.

I am also very please, to note that the issue of agriculture is also twined with disaster risk management. The issue of disaster risk management has become very important in the way in which CDB carries out its work. Some years ago, CDB was the beneficiary of the US Aid Grant Programme, which was geared towards mainstreaming disaster risk management issues within the work of the bank. Many of us sat through intensive training courses where we learnt about the principles of disaster risk management. We also learnt about how in a very practical way it would be integrated into the main line business of CDB, which is lending and providing grants to our borrowing member countries.

More recently, the Caribbean Development Bank has been privileged to associate itself with the Caribbean Catastrophe Risk Insurance Facility, which is so much involved in the business of risk transfer. I am also please that that institution has been able to set aside a portion of its resources to address issues of disaster risk management and most of all I am pleased to say that I have been selected as the candidate to sit on the Board of the Caribbean Catastrophe Risk Insurance Facility, representing CDB and the other donors. That is an institution which is playing a very, very important role in this area of work.

We at the CDB would think that one of the important roles that we play is to use our convening power as we refer to it to bring together Caribbean people and people from outside of the region to discuss; to deliberate and to examine important issues. For that reason, I am very pleased this evening to be able to recognize the CDB logo in front of us here, representing our participation in this important gathering.

As I looked at the agenda that we are going to be going through over the next few days, I must confess that I was awestruck by the quality of the line up. Those of us who manage to put together that theme deserve our sincere congratulations.

In closing, let me say once again, thank you very much for having me here and thank you also for giving me the opportunity to be able to speak on behalf of the CDB and to associate myself and my institution with this important event.

Thank you very much.

## REMARKS

### Mr. Carlos Arce

Senior Economist, World Bank

---

Good Evening.

Minister Baptiste; Minister Walter; Senator Francis; Colleagues from Regional Institutions; Policy Makers; Farmers; Ladies and Gentlemen.

The first thing I would like to say is that when we received at the World Bank invitation from Minister Baptiste to participate in this event, we did not hesitate to immediately reply and we were very happy to express that we were bringing a team of experts in agricultural risk management and also to support this event.

For the World Bank, it is very important. We think that it is our obligation, it is our objective; it is compatible with our mandate to come here and share with you the experiences we have in this area of work, not just in the Caribbean but also in other parts of the world and we are very glad to do that.

There is a team from the World Bank here with me and they will be making presentations, participating in the discussion and we hope that this will be a very, very productive event.

I would also like to say that we at the World Bank are here in the Caribbean in these activities providing technical assistance and advisory services to various countries since the funding of the All Caribbean Commodity Programme Finance by the European Union and since that programme, we have already been active in Jamaica, Grenada, Belize, Haiti and recently in Guyana.

Our participation has been, not just in area of agricultural insurance, which most of you are interested in, but also in other type of agricultural risk within a broader spectrum of agricultural risk management.

We all know the devastating effects that catastrophic events have on rural households, rural working groups depleting their assets, depleting their savings; affecting incomes and probably condemning many households into poverty perhaps. So this is an area that I'm glad to see we can all have a contribution to see how each country or at regional level can start adopting more effective management strategy for their agricultural sector.

I would also like to say that we are happy to hear CDEMAs focus, we are happy because they are not just focusing on transfer. Transfer is just one part of a broader range of agricultural risk management and CARDI has also mention the importance of prevention of agricultural risk, how to prevent the risk before they happen. Agricultural extension and research plays a very, very important role and we have a tendency to over look that, when in fact, we have to reinforce the work of agricultural extension and agricultural research, because prevention is one first pillars in any agriculture risk management strategy.

Transfer plays a very important role also and most of you will be very interested to hear what our experiences have been in this area, but its also important to recognize the coping mechanism. The public sector has a very importing role in coping, in helping once an event happens, how to support effectively; transparently, to enable farmer to produce again.

This week, we will be discussing possibilities, opportunities in designing and implementing regional agricultural management strategies. We know that this is not an easy task, however with the common knowledge here and participation of some of the technical people that would be presenting, we hope that this event will have a very productive outcome and we wish you a very productive event.

Thank you very much.

## REMARKS

### Mrs. Florita Kentish

Sub-regional Coordinator for the Caribbean, Food and Agriculture Organisation of the United Nations (FAO)

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Honourable Minister of Agriculture, Land, Housing and the Environment Hilson Baptiste; Honourable Ministers from CARICOM countries; Senior Officials of the Ministries of Agriculture and other Ministries; Representatives of international and regional organisations; Specially invited guests; Ladies and gentlemen, Good evening.

The Agricultural Insurance Symposium to unfold over the next three days is a major activity under the draft work plan of the Agricultural Sector Disaster Risk Management (DRM) Committee that is so effectively chaired by the Minister of Agriculture in Antigua and Barbuda, the Honourable Hilson Baptiste, and technically supported by FAO, IICA and CARDI.

It should be noted that this Committee emerged through the amalgamation of the Agricultural Sector Sub-Committee of the comprehensive Disaster Management Programme managed by CDEMA and the Technical Advisory Management Committee linked to the Jagdeo Initiative constraint of “deficient and uncoordinated DRM including praedial larceny”. This Committee is tasked with the coordination of activities in the Caribbean region related to the mainstreaming of COMPREHENSIVE Disaster Management and to the alleviation of the Disaster Risk Management constraint.

Mr. MC, Honourable Ministers, participants, ladies and gentlemen, I bring greetings and best wishes to the Government and people of Antigua and Barbuda and to the other participating countries in the symposium, from the Director-General of FAO. He wishes for a very successful meeting and looks forward to the major outcomes and follow up during the coming years. In fact, FAO as a strong advocate of DRM within the agricultural, forestry and fisheries sectors pledges its continued support to the excellent work of the Agricultural Sector DRM Committee and to all FAO member countries, working to pursue programmes in this important area.

Disasters, as their name implies, hit very hard. All communities suffer adversely from them (drought, excessive rains, storms, hurricanes), particularly groups with limited or poor resources suffer most. Among these are low asset farmers.

Agricultural insurance is generally a much talked about option but generally not as a number one option or a very attainable one. It is known to be difficult to implement. There have been many have been pilot programmes targeting especially small scale farmers in developing countries; often set up with unrealistic expectations; therefore they have been commercially unsustainable and short-lived.

Among the recent developments, index insurance has quickly gained increased interest. With an index insurance, claims are calculated based on the value of an external index, such as rainfall, temperature and wind speed, thus not on losses measured in the field as is the case with classical insurance programmes. The indexes are highly correlated with losses and designed to reflect as accurately as possible losses incurred by the farmer when a certain index value is recorded. Despite these apparent advantages, take up of index products by both insurers and farmers is low.

Agricultural and crop insurance for small farmers will most likely continue to be high on the agenda of governments and donors alike. Continued research will hopefully help overcome some of the current problems. For example, could collective insurance as opposed to individual insurance for small-holders be a way forward? More work may also need to be done about farmers’ perception of risk and their present risk management preparedness strategies.

Although insurance belongs primarily to the business setting, the very nature of crop insurance means that there is bound to be strong governmental involvement. Most governments have a close interest in risk management in agriculture, both for food security reasons and the concern for the wellbeing of rural populations. This often means that governments need to become more involved not only in policy but also investigations

relating to feasibility of insurance products, heading to eventual promotion, such as is taking place through the agricultural sector steering committee and now this present symposium.

In practice, agricultural insurance is almost invariably an adjunct to a whole set of risk management measures of which adequate farm management practices constitute the most important element. Insurance by itself is no substitute for good production practices. The acid test of developing and operating an insurance programme to complement other risk management measures depends ultimately on the cost/benefit ratio to the farmer and to the potential insurance providers.

We at FAO have been actively involved in the area of agricultural insurance through feasibility studies, policy advice and direct support to member countries. Recent examples have been the support to governments of the Commonwealth of the Bahamas and the Seychelles and current technical assistance to the governments of Saint Lucia, Belize and Dominica, and our involvement in this symposium, which opens the window for further collaboration in the region.

We hope to share during this symposium the results of some of the work being done in a few of these areas for possible consideration in the way forward.

Both the recently concluded COTED in Suriname and our own regional Conference in Panama this year, gave some strong indication that Disaster Risk Management is a major priority for our region. Agricultural insurance, as one option talked about ad nauseam, must be given full vent towards possible solutions.

The Food and Agriculture Organisation and the Sub-regional Office gives full support to this endeavour.

Thank You.

## REMARKS

### Victor del Ángel

Director of Management and Regional Integration, IICA  
on behalf of Dr. Victor Villalobos, Director General, IICA

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Mr. Chairman,

It is with a great sense of honor that I accepted this invitation to address you, on behalf of the Director General of IICA, Dr. Victor Villalobos, and indeed, on behalf also of the entire family of IICA in the Hemisphere.

IICA is pleased to be associated with our strategic partners in development, particularly: the Food and Agriculture Organisation (FAO), the World Bank, the European Union (EU), the Caribbean Development Bank (CDB), CARDI and the Caribbean Disaster Emergency Management Agency (CDEMA), in supporting the CARICOM Secretariat and the Ministry of Agriculture, Lands, Housing and the Environment of Antigua and Barbuda, in realizing this first ever Insurance Symposium in Caribbean Region, to begin the process of formulating a risk management strategy for the agriculture sector.

IICA is one of the agencies mandated by the Regional Ministers of Agriculture to support the CARICOM Secretariat, and the Member States with the alleviation of the Key Binding Constraints to the agricultural development process in the Caribbean, under the Jagdeo Initiative.

As you surely know, one of the nine key binding constraints is **Deficient and Uncoordinated Risk Management Measures, including Praedal Larceny**.

The Jagdeo Initiative makes a clear link between the limited and declining investment and financing for agriculture in the region, and the general lack of risk management mechanisms. It makes a strong call to develop an integrated and coordinated approach to risk management, including innovative agricultural insurance instruments, as risk mitigation facilities.

In that regard, IICA has given support in several areas. Among others in 2006, IICA, through our Caribbean Agricultural Policy Network in the Office in Trinidad, in collaboration with the CTA, published a special paper: ***“Managing Hazards, Reducing Risks and Increasing Investments in Agriculture: Some Perspectives”***.

The Institute, through our Coordinator for the Regional Cooperation Agenda, assigned to the CARICOM Secretariat, is a member of the Technical Management Advisory Committee (TMAC) on Disaster Risk Management in the Agriculture Sector. This Committee is chaired by the Agriculture Minister of Antigua, Mr. Hilson Baptiste, and includes the FAO, IICA, CARDI, UNECLAC, CDEMA, CARICOM Secretariat, the Caribbean Institute for Meteorology and Hydrology, the Caribbean Regional Fisheries Mechanism (CRFM), CAFAN, CABA, and the OECS. The Technical Management Advisory Committee (TMAC) has responsibility for the development, integration, coordination, and management, of all activities in the Caribbean Region, related to Agricultural Risk Management, and is now in the process of implementing its Strategic Plan, for the years 2010 through to 2012.

IICA, in collaboration with UNECLAC (CEPAL), continues to provide support to member states in the building of capacity for disaster damage, and loss assessment as well as in the conduct of the necessary actions that should be taken in the aftermath of a disaster.

Climate change will result in the Caribbean agricultural sector having to deal with increases in the frequency, and intensity of extreme weather events such as stronger hurricanes and tropical storms, with associated increases in storm surge, wind and precipitation intensity, and possible increases in flooding and landslides. The implications for the Caribbean region’s experience with climate related disasters therefore, points to the need for the development of a regional agenda for the integration of climate change adaptation and disaster risk reduction.

Agriculture, natural resources and climate change is a core thematic area of concentration in IICA’s 2010 – 2014 Medium Term Plan. This is aimed at improving risk management and the response to emergencies, to make



agriculture less vulnerable, as well as to adapt agriculture to the effects of climate change, and mitigate the impact of production activities on the environment and natural resources.

This means that we in IICA are ready to continue to support this kind of activities related to risk management in agriculture, which is already important and likely to become more important in the near future. There are several tools for managing agricultural risk, within agricultural insurance being only one of them.

The multitude of objectives along the process of developing an agricultural risk management strategy, and an insurance programme requires careful analysis and planning. The development of an agricultural insurance regime also requires time and understanding. It is often said that there are no quick fixes in agriculture.

IICA's role is to support the sustainable development of the agricultural sector to create prosperity in the rural communities in the Americas, including the Caribbean Region. This can only be achieved through close cooperation with our Member States and strategic partners in development, and with spirit of partnership.

Mr. Chairman, it is anticipated that these actions will go a long way, in enhancing food security and rural life in the Region. But through activities like this seminar we can assure we are in the right way.

Lastly, let me take this opportunity to wish you all the success in this Symposium.

I thank you very much.

## REMARKS

### Mr. Sergio Garcia

Programme Manager, Agriculture and Industry, CARICOM

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Thank you Mr. Chairman.

Hon Hilson Baptiste, Minister of Agriculture, Hon Matthew. Walter, Minister of Agriculture of Dominica; Minister Lett from Grenada, I think your presence here is showing the importance you are giving to this event.

I have two real challenges: - one is coming to the microphone after eloquent speakers especially like the Minister, who sets the bar very, very high. I think it's a difficult task. The second is that I know most of you are a bit tired and probably bored with all these things, but I'll try to do a quick summary before I say thank you to everybody.

- 1) The CARICOM Secretariat has evolved to take a series of leadership and changes, where we are correlating the work of the region in terms of the agricultural sector where we are trying to coordinate a network with our international partners in development to achieve results as the Minister is saying, by that we mean that we don't want obligation or we are trying to cover the gaps. Definitely all the speakers have said that agriculture has taken a major importance because of the concept and issues of food security for the region.
- 2) Regional symposium is the effort of a specific committee that has been set up by the Secretariat, given the Member States involvement to take leadership of a particular constraint. In this situation we are talking about risk mitigation and disaster risk management. I think that the Minister took serious leadership and challenge his committee to be result oriented, and I think that when he took this suggestion to COTED in Suriname, he was given the green light and I definitely want to congratulate and thank the Minister and his team and the committee, I'll ask you to give him and his committee a big round of applause.
- 3) As the FAO Representative mentioned that the COTED has stipulated that in its food priority areas, disaster risk management is one of them, therefore a lot of efforts and coordination is being put into this particular area.

Giving and having said that, I would like to just really say that one of the things we can take home is that agriculture is a high risk business, therefore we have to have mechanisms to offset and to ensure that the end objectives of agriculture and the contributions and economy as the Minister was saying, the contribution to food security and the contribution to the rural livelihood and governance and environmental sustainability of development is key.

There are a lot of experiences at the global level that we need not to reinvent the wheel, take those and learn from the mistakes that have been made, so that we can adapt to our region the best suited approach to mitigate risk in agriculture. I think that if we can really arrive at a set of mechanisms and systems, then we have achieved success in what we are setting out to do.

We must do certain things that can prevent and help us adapt to the changing environment. We are all aware of climate change and the effects, but using technology as CARDI was proposing, using certain strategies before can mitigate us; and then we must have a certain level of strategies that happens after. What happens after in case you have a disaster? What are the response mechanisms? What do we have in place to improve the resiliency of the agricultural sector? I think that we have to have these concepts very clear and what we want to achieve.

Finally I have to say that I think there is great, great expectation from the farming sector to this workshop. I think the Minister was very clear, while we come and talk we have to be results oriented. So I'm challenging you the participants in this workshop to ensure that when we leave we have something concrete on the way forward for the Caribbean region.

I think that the private sector of the region is very much aware of what is happening. In fact, before we came here I know that in Guyana the farmers were asking "what happens after the workshop". What is the outcome of this symposium? What will we take back and say to our productive sector, that we have achieved over the last three days?

I have to challenge everybody. I think the Minister is right because we cannot wait forever; we must be results oriented, we have to respond in time and we have to have the impact the farming sector is expecting from us. I think that should definitely be our goal, to take back something concrete.

The last comment I want to make is that this is like a stool where you have three legs; one is the international partners in development including the financing institutions, who the Minister says we have to be very good friends with; the second one is the public sector and governments have to be clear what we want and the third leg of the stool is the farming sector. How do we better organize ourselves? How do we commit? If any one of the legs is weak the stool would not stand up.

So we must thank all the key partners in this effort; besides the Minister and his team, the World Bank; CDB; FAO; IICA; CDEMA, I think have a strategic role to play. CARICOM Secretariat's role is to coordinate; to provide leadership; to provide clearer objectives and goals that we want to achieve for the region and how do we develop strategies and mechanisms to achieve those. I am pretty sure that The Secretary General and the Assistant Secretary General would have like to be here but the regional agenda is so busy that even as I speak there is an on going COTED meeting. Rest assured that the Secretariat is busy attending to regional requirements for the development and integration into a common single market.

I have to make that comment because definitely unless the member states are convinced that the Secretariat is working for their benefit then it would not work as the Minister is saying. Why do we do certain things if will not have success. Having said that I would like to thank everyone including you the participants for patience and bearing with us, but at the end of the day I hope that we can have success in our deliberations and take home something concrete.

## ADDRESS

### Honourable Hilson Baptiste,

Minister of Agriculture, Lands, Housing and the Environment, Antigua and Barbuda

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*The Honourable Minister did not use a prepared speech. The following is a summary of the main points that he raised during his feature address at the opening ceremony.*

The Hon. Hilson Baptiste welcomed his colleague Ministers of Agriculture from the Commonwealth of Dominica and Grenada and members of the head table. He thanked all for being present and particularly representatives of the donor agencies, which had provided funding for the hosting of the symposium.

Minister Baptiste provided some background to Antigua and Barbuda's being given the mandate to lead the charge where disaster risk management and praedial larceny was concerned, as under the Key Binding Constraints of the Jagdeo Initiative. He pledged his commitment, as Chairman of that group, to ensure that he would "make things happen". He thanked all of the organisations for committing themselves to working together on this task and stressed the need to arrive at serious outcomes, during the symposium, which would assist in carrying the process forward.

Minister Baptiste recorded his displeasure at the region's high annual food import bill of 4 billion dollars, adding that there is ample land and favourable conditions in the region for us to grow more of our own food. He added that there is a need for greater sharing of information and technology in order for the regions to achieve greater self-sufficiency in food production. He boasted that food grows so easily in our region and there is no excuse for us not to produce more food. Even despite disasters, the region's farmers are very resilient and in the wake of disaster, they know how to start all over again.

The Hon. Minister spoke about praedial larceny, which was to provide a significant part of the deliberations during the symposium. He described this as a serious issue that affects between 20 – 35% of the farmers in the region – an issue that must be dealt with. He suggested that praedial larceny is sometimes owing to the fact that many farmers do not live on their lands. He offered as a solution, increased granting of leases to farmers, which would give them the right to construct permanent structures on their land, thereby allowing them to live on the farm and be in a better position to address issues of praedial larceny.

Minister Baptiste expressed the hope that the entire approach to insurance for all the farmers needs would be explored. He added that we must give the insurance companies something to want to insure. He reminded that disasters happen more frequently and more intensely than ever before and that it is now more than important that serious steps be taken to give the farmers the protection they need.

Other key points of focus in the Minister's delivery were health and nutrition and the issues surrounding the quality of food that is imported by the region. He spoke about foods that are grown under abnormal conditions, in faster times and with excessive use of chemicals, which are shipped to the region for mass consumption by our Caribbean population. Consumption of these foods results in large measure in increased health problems among the population as well as premature growth in young boys and girls. He stressed that we have to control what we put in our bodies – food that we grow in the region.

The Honourable Minister reminded that agriculture is still not very well respected across the region and expressed the need for those gathered to demonstrate that it is the number one industry in the world. He charged those present to be "proud of agriculture, proud to work in it, with it and for it."

In Antigua, agriculture is reported as contributing 2.5% to the Gross Domestic Product (GDP). Minister Baptiste recognized the contribution of small producers, e.g. the coconut and corn vendors, who do big business and earn a good living off their trade. He also alluded to the fact that the value and contribution of work carried out by extension officers, livestock staff, forestry division is not taken into consideration. He suggested that if one

takes into account the combined efforts of everyone in the sector, agriculture's contribution to GDP would be pushed to 8.5%.

Minister Baptiste stressed that we must take better care of our region. He reminded that governments change – and he challenged the technicians and policy makers to form policies and hold governments to them; not to let each new government change policy after policy. He advised that it is important to have a standard policy for agriculture if we are to move the sector forward.

***“I charge the technicians to be focused.***

***Don't let anyone divide us.***

***At the end of the day, the entire agriculture sector stands out in the region. That, we all can benefit from.”***

Minister Baptiste invited other regional agricultural based organisations to come on board and attend to these issues. He added that it only takes one disaster to wipe out the entire agriculture sector in the region and reminded that the hurricane season for the Caribbean has now been extended from June to January.

He charged those present to work hard over the days of the symposium and come up with a plan that would advance the process of negotiating on behalf of the farmers of the region, so that they may have all the protection they need.

Minister Baptiste thanked all of the supporting agencies: The Australian Government Aid Programme, the CARICOM Secretariat, the Caribbean Agricultural Research and Development Institute (CARDI), Caribbean Development Bank (CDB), Caribbean Disaster and Emergency management Agency (CDEMA), the European Union (EU), the Food and Agriculture Organisation (FAO), the Inter-American Institute for Cooperation on Agriculture (IICA), the World Bank and the for their financial and technical assistance.

He closed by inviting the participants of the workshop to join him in touring two of the Ministry's experimental stations and having lunch with him, enjoying some of Antigua's locally grown fish and organic chicken, prepared by one of the finest chefs on the island.

***“I know many countries in the region put all their resources into tourism and many persons think agriculture is a non-entity. The entire world started with agriculture. We were told to till the earth and we are expected to live from the earth.”***

Hon. Hilson Baptiste  
Minister  
Agriculture, Land, Housing and the Environment  
Antigua and Barbuda (June 2010)

# **PUBLIC SECTOR PERSPECTIVES**

***SESSION 1:***  
***Agricultural Risk Management in the Caribbean:***  
***Public Sector Perspective***

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Chair: Mr. Trevor Murray  
Inter-American Institute for Cooperation on Agriculture

**LIVING WITH RISK...STRATEGIES FOR MAINSTREAMING DISASTER RISK MANAGEMENT  
IN THE AGRICULTURE SECTOR**

MS. ELIZABETH RILEY

DEPUTY EXECUTIVE DIRECTOR (AG) OF CARIBBEAN DISASTER EMERGENCY MANAGEMENT AGENCY (CDEMA)

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**Organisational Overview of CDEMA:**

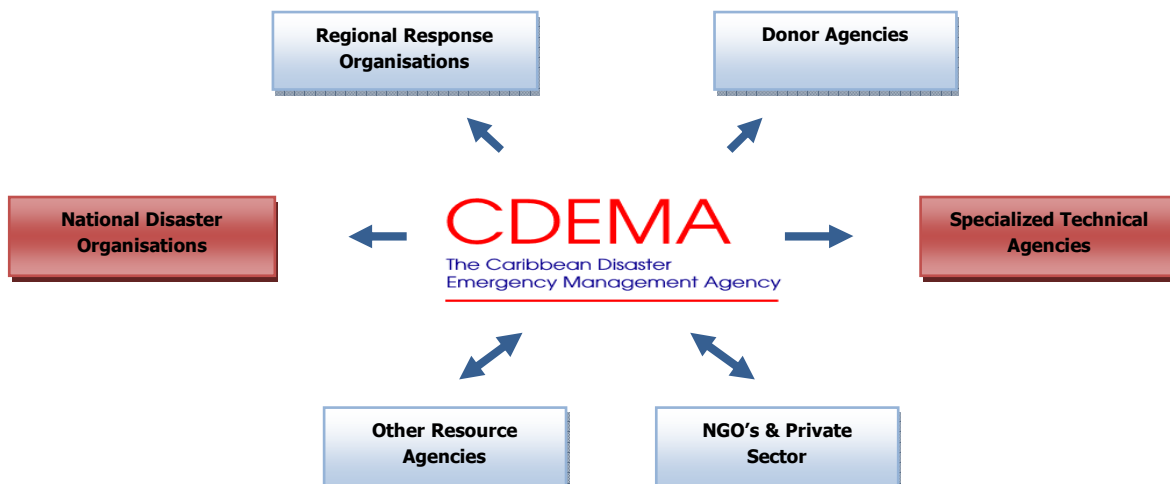
CDEMA (formally CDERA) is the regional inter-governmental Agency responsible for disaster management in the Caribbean Community (CARICOM) and was established in 1991 by an Agreement of Heads of Government of CARICOM. In September 1, 2009 – official date of transition from CDERA to CDEMA with 18 Participating States – Haiti and Suriname joined September 1, 2009.

**Role and Function of CDEMA:**

- a) mobilising and coordinating disaster relief in the Caribbean
- b) mitigating or eliminating, as far as practicable, the immediate consequences of disasters in Participating States;
- c) providing immediate and coordinated response by means of emergency disaster relief to any affected Participating State;
- d) securing, coordinating and providing to interested inter-governmental and nongovernmental organisations reliable and comprehensive information on disasters affecting any Participating State;
- e) encouraging –
  - (i) The adoption of disaster loss reduction and mitigation policies and practices at the national and regional level;
  - (ii) Cooperative arrangements and mechanisms to facilitate the development of a culture of disaster loss reduction; and
  - (iii) Coordinating the establishment, enhancement and maintenance of adequate emergency disaster response capabilities among the Participating States.

CDEMA's functions are achieved by CDEMA's INTERACTIONS with the following partners: Regional response organisations; Donor agencies; National Disaster Organisations; Specialized Technical Agencies; NGO's and Private Sector and Other Resource Agencies as depicted in diagram.

**Diagram 1: CDEMA's INTERACTIONS**





### **The Caribbean Hazards Landscape:**

Caribbean region is very prone to natural hazards and Climate variability and change likely to increase frequency and severity of hydro meteorological events. The Caribbean has seen an increased exposure to natural hazards within the last two decades and increasing value of losses across all economic sectors – tourism, agriculture, housing, infrastructure, and more importantly, disruption to social infrastructure, loss of livelihoods with poverty implications.

**Table 1: Economic Damage from Selected Events in the Caribbean:**

| Event/ Country                                | Damage (\$US) |
|---|---------------|
| <b>Hurricane Georges (1998)</b>               |               |
| Saint Kitts                                   | >480M         |
| Antigua and Barbuda                           | >250M         |
| Dominica                                      | >170M         |
| <b>Hurricane Lenny (1999)</b>                 |               |
| Anguilla, Dominica, Saint Kitts & Nevis       | >250M         |
| <b>Trinidad Flood (2000)</b>                  | 2.4M          |
| <b>Tropical Storm Lily Saint Lucia (2002)</b> | 7.5M          |
| <b>Jamaica Flood (2002)</b>                   | >100M         |
| <b>Hurricane Ivan (2004)</b>                  |               |
| Cayman Islands-                               | 3.4B          |
| Grenada                                       | 889M          |
| Jamaica                                       | 595M          |
| Saint Vincent                                 | 40M           |
| Saint Lucia                                   | 6M            |
| <b>Guyana Flood (2005)</b>                    | 169M          |

**Table 2: Major Hazards and Impacts on Agricultural resources**

|                   | Land   | Crops                                  | Livestock  | Infrastructure                    | Marine Fisheries              |
|-------------------|--|--|--|-----------------------------------|-------------------------------|
| <b>Hurricanes</b> | Soil loss, reduced access                                      | Physical removal of crop               | Death and injury from flying debris, structural collapse | Minor damage to total devastation | Damage to boats and equipment |
|                   | Leaching of nutrients  | Damage to plant parts                  | Drowning   | Impassable roads                  |                               |
|                   | Increased salinity after storm surge, salinization of aquifers |  | Isolation, starvation                                    |                                   |                               |
| <b>Drought</b>    | Salinity, crusting   | Stunting, reduced flower and fruit set | Starvation, dehydration                                  |                                   | Changes to marine ecology     |
|                   | Wind erosion   | Death of affected plants               | Heat stress, reduced fecundity and fertility             |                                   |                               |
|                   | Salinity, crusting   | Leaf shedding                          | Nutritional disorders, reduced forage quality            |                                   |                               |
|                   |  |  | Death  |                                   |                               |

### **Climate Change and Agriculture in the Caribbean:**

The region's agriculture, forestry, and fisheries sectors; water resources; are considered to be among the most vulnerable to damage from climate change. Vast majority of agricultural production across the region is rain-fed and projected reduction in precipitation would have a serious impact on food security and exports. In addition, changes in rainfall patterns will increase crop vulnerability to certain diseases.

### **COMPREHENSIVE DISASTER MANAGEMENT (CDM) – A REGIONAL FRAMEWORK FOR COOPERATION AND RESOURCE SHARING IN DISASTER MANAGEMENT:**

#### **What is Comprehensive Disaster Management (CDM)?**

Comprehensive Disaster Management (CDM) is the management of all hazards through all phases of the disaster management cycle – prevention and mitigation, preparedness, response, recovery and rehabilitation by all peoples public and private sectors, all segments of civil society and the general population in hazard prone areas. CDM involves risk reduction & management and integration of vulnerability assessment into the development planning process. (CDERA 2001 and 2006).

CDM is paradigm shift from being *Reactive to Anticipatory* and from the *National Disaster Office to Shared Responsibility*. A shift from a focus on individual hazards to viewing hazard exposure as an ongoing process and aims to reduce vulnerability across all sectors - (CGCED 2002).

#### **Comprehensive Disaster Management (CDM) in Context:**

Global Agenda:

- Hyogo Framework for Action 2005-2015

Regional Agendas:

- CARICOM Regional Programming Framework 2005 – 2015
- Caribbean Single Market and Economy
- St. George's Declaration of Principles for Environmental Sustainability (Organisation of Eastern Caribbean States).

Benefits of a Comprehensive Disaster Management (CDM) framework for the Caribbean: A regional framework for disaster management: Emphasizes natural hazard risk reduction; Promotes a "culture of safety"; Recognizes that strengthening disaster preparedness for better response is critical; Encourages strategic partner alliances; Advocates for empowering of sector partners to (take responsibility) and lead dissemination and advocacy with their constituency.

#### **Summary of Comprehensive Disaster Management (CDM) framework for the Caribbean:**

**Goal:** Regional Sustainable Development enhanced through Comprehensive Disaster Management

**Purpose:** To strengthen regional, national and community level capacity for the mitigation, management and coordinated response to natural and anthropological hazards, and the effects of climate change.

**OUTCOME 1:** Enhanced institutional support for CDM Programme implementation at national and regional levels.

**OUTCOME 2:** An effective mechanism and programme for management of comprehensive disaster management knowledge has been established.

**OUTCOME 3:** Disaster Risk Management has been mainstreamed at national levels and incorporated into key sectors of national economies (including tourism, health agriculture and nutrition).

**OUTCOME 4:** Enhanced community resilience in CDEMA states/ territories to mitigate and respond to the adverse effects of climate change and disasters.

**Partnership for Risk Reduction: A key Pillar of Comprehensive Disaster Management (CDM):**

Since its inception, CDEMA has pursued a policy of collaboration with national, regional and international organisations which have overlapping interests to avoid duplication. Partnership also ensures more rational use of the limited resources available to the region and ensures that technical assistance provided is of the highest quality as each agency is allowed to take the lead in the area where it has specific technical expertise.

**The Comprehensive Disaster Management (CDM) Governance Mechanism:**

The 2007 CDM programming consultation agreed for the establishment of a CDM governance mechanism to provide policy and technical advice for CDM implementation at the national, regional and sector levels. This led to the establishment of the Comprehensive Disaster Management Coordination and Harmonization Council (CDM CHC) on 10 December, 2007.

**CDM CHC PURPOSE:** To provide technical guidance on matters related to programming implementation in order to foster sustainable governance of the enhanced CDM Strategy and Framework 2007 -2012.

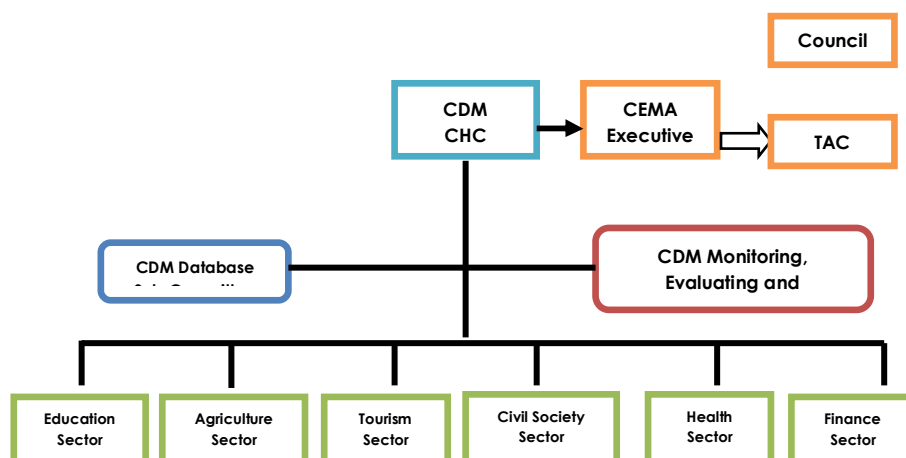
**CDM CHC OBJECTIVES:** To mainstream Disaster Risk Management at the national level and into key sectors of national economies and to facilitate the effective coordination and harmonization of the CDM implementation process.

**Membership of the CDM CHC:** Participating States: CDEMA Sub-Regional Focal Points; Development Partners; Sector Leads: are representatives of agencies that have volunteered to facilitate/Chair Sector-Sub Committees, which comprise specialized agency representatives and CDEMA CU: Chairman and Secretariat for the CDM CHC.

**Priority Sectors:** Six Sectors have been prioritized in the Enhanced CDM Strategy for focus during the period 2007-2012. These sectors include – *Education, Health, Civil Society, Agriculture, Tourism and Finance*. The following Sector Leads have been confirmed:

- ✓ Education: *University of the West Indies;*
- ✓ Health: *Pan American Health Organisation.*
- ✓ Civil Society: *Caribbean Policy Development Centre (CPDC) and IFRCs*
- ✓ Agriculture: *Food and Agriculture Organisation*
- ✓ Tourism: *Caribbean Tourism Organisation;*

**Comprehensive Disaster Management (CDM) Governance Structure:**



### **Progress in the mainstreaming of CDM in the Agriculture Sector:**

Amalgamation of the Jagdeo TMAC and ASSC to form the *Agriculture Disaster Risk Management Committee (ASSC/TMAC)*.

**Membership includes:** Minister of Agriculture, Lands, Housing and Environment of Antigua & Barbuda – **Chair**; United Nations Food & Agriculture Organisation (FAO) – **Lead Technical Agency**; Caribbean Regional Fisheries Mechanism (CRFM); Caribbean Farmers Network (CAFAN); Inter- American Institute for Cooperation on Agriculture (IICA); Caribbean Disaster Emergency Management Agency (CDEMA).

**Ad Hoc:** Caribbean Network of Fisher Folk Organisations and Caribbean Coordinating Organisation for the Red Cross (CCORC).

### **Functions of the ASSC/TMAC:**

- Recommend broad policies for addressing the deficient and uncoordinated risk management measures existing in the region, including praedial larceny & provide overall guidance at the agriculture sector level to facilitate the mainstreaming of CDM at the national & regional levels
- Initiate and promote new ideas, methods and instruments aimed at addressing the constraint while articulating and advancing the priority CDM results for the sector
- Coordinate the Annual Work Programme, including the operational budget and lead the process in securing the necessary resources for the execution of the work programme.
- Agree on and utilize a mechanism for monitoring, evaluating and reporting on the work programme of the Committee
- Provide timely reports to the COTED and CDM CHC and other relevant institutions through the Chair and Lead Agency respectively on the performance and levels of compliance with targets and procedures agreed upon, identifying challenges and gaps in achieving the prioritized results of the interventions
- Assess results and recommend future broad direction for the alleviation of the constraint

### **Identification of Priority Areas for the Agriculture Sector:**

- *Risk transfer mechanisms for the sector* - Incorporating Hazard information and disaster risk Management measures in agriculture sector planning and development and Enhancing Capacity for the conduct of Disaster Damage Assessment and the Design of Rehabilitation/Reconstruction Plans for the Agricultural Sector
- *Introduction of Measures aimed at the reduction of Praedial Larceny-*
- Enhancing Institutional mechanisms for the development and implementation of interventions related to Disaster risk management
- Enhancing Preparedness, Response and Mitigation capacity in the Agriculture Sector
- Raising the awareness and knowledge of farmers on disaster management & related procedures

Multi Year Work Programme developed for the mainstreaming of Comprehensive Disaster Management (CDM) within the Agriculture Sector in the Caribbean and Key initiatives for the Agriculture Sector (short to medium term) identified and implemented.

**Expected Results in the mainstreaming of CDM in the Agriculture Sector:**

1. Hazard information and disaster risk Management measures incorporated in agriculture sector planning and development
2. Agricultural risk management protocols and resource facility developed
3. Risk transfer mechanisms for the sector designed and implemented with a focus on agricultural insurance
4. Improved national and local capacities for hurricane related disaster mitigation, preparedness and response in the agricultural sector
5. Enhanced culture of agricultural risk management at the regional, national and local levels
6. Capacity for the conduct of Disaster Damage Assessment and the Design of Rehabilitation/Reconstruction Plans for the Agricultural Sector enhanced.
7. Measures aimed at the reduction of Prædial Larceny promoted and supported Information generated on the diversity, ecology, and evolution of the influenza A subtype H1N1 Virus in Swine population and the potential risk of animal-human transmission and vice versa.
8. Field surveillance and laboratory systems strengthened to ensure detection and diagnosis of the influenza viruses and other potential subtypes in the swine population in target countries.

**CDEMA's Way Forward – Policy Considerations:**

1. Multi – hazard approach
2. Hazard Risk Assessment for fact based planning –
  - ✓ Incorporation of hazard information into agricultural development planning and Incorporation of the science – CC
3. Planning for all aspects of Disaster Management Cycle – preparedness, response, mitigation, prevention, recovery
4. Capacity needs? How does the Sector assist itself during times of emergency? Role of pre-planning.
5. Tran boundary nature of threats – actual and/or perceived – collective action
6. Institutional arrangements – national and regional
7. Post disaster damage assessment based on sound methodologies
8. Role of regional funds in Agricultural Risk Management

## **Introduction**

In 2003, Dr. Patrick Kendall of the Caribbean Development Bank (CDB) undertook a review of the performance of the agriculture sector in the Caribbean in a paper entitled – “The Current State and future of Caribbean Agriculture”.

His research revealed that, with few exceptions, even during periods of favorable preferential market access, major performance indicators in the sector were on the decline. Not much has changed since that 2003 review - recent performance data clearly show that the agriculture sector in the Caribbean continues to face severe challenges, including:

1. The effects of Globalization and Trade liberalization which have eroded preferential access for traditional exports and increased competition on the domestic market as a result of the gradual removal of barriers to entry;
2. The generally high cost of production inputs such as land, labour, electricity, water, agro-chemicals, transportation etc. all of which serve to reduce the competitiveness of the agriculture sector;
3. The location of most of the islands within the Atlantic Hurricane Belt and the consequent susceptibility to weather-related hazards i.e. high winds, excessive rainfall, droughts etc.
4. The relatively small size of the typical production unit which limits the possibilities for economies of scale.

Dr. Smith generally, concurred with Dr. Kendall’s conclusion that, neither export agriculture, even with preferences, nor domestic agriculture, has been a source of dynamism within Caribbean economies for some time now, despite their continued importance in some economies as a source of foreign exchange earnings and employment.

The impact of the decline in the sector’s performance on Caribbean economies is very visible. Caribbean countries are increasingly dependent on food imports to satisfy their dietary needs, with the food import bill for the region growing from USD1.1 billion in 2001 to USD1.6 billion by 2005 – an increase of more than 45% over 5 years.

The global food crisis in 2008 also illustrated the region’s extreme vulnerability to shortages and sharp increases in prices resulting from events in the global food economy. The decline in the performance of the sector has had a disproportionate effect on the Caribbean’s poor. National and CDB-financed Country Poverty Assessments all point to an increase in poverty levels, particularly in rural areas which have traditionally been dependent on the agriculture sector as the main economic activity.

In the face of a generally gloomy picture of the sector across the region, sugar and rice in Guyana, and more generally fruits and vegetables and ground provisions in several countries have shown some resilience and prospects for growth. What is apparent, however, is the fact that the emerging sub-sectors, in particular the crop sub-sector, have not been able to fill the void left by the decline in the traditional export sub-sectors (sugar, bananas, citrus, etc.).

The Jagdeo Initiative has articulated very well the constraints to the development of a dynamic Caribbean agriculture sector which can make a meaningful contribution to economic development, food security and poverty

reduction. These impediments run the gamut of the entire agriculture value chain, encompassing research, production, marketing distribution and financing. But underlying all of these facets of the industry is the urgent need to change the risk profile of the sector as a whole. The matter of risk is the primary focus of this important workshop.

**CDB’s Experience in Financing Agricultural Development in the Caribbean:**

It will come as no great surprise to most of you to learn that, over the last 10 years, both public and private sector investment levels in Caribbean agriculture have declined in absolute terms and in comparison to other sectors. Over the period, 1970 to 2009, the CDB, the largest Caribbean-based development finance institution, has disbursed approximately USD342 million through loans, equity and grants to the sector. A break-down of these figures, however, clearly demonstrate that there has been a sharp decline in both absolute and relative terms for CDB resources for agriculture over the past decade.

Between 1970 and 1999 CDB’s net approvals (loans, equity and grants) to the agriculture sector were approximately USD275 million representing some 16% of the Bank’s total net financing (Table 1) and an average of USD92 million for each of the three decades. However, while net approvals by the CDB to all sectors over the ten year period, 2000-2009, are almost equal to approvals for the preceding 30 year period, 1970 to 1999, net approvals to the agriculture sector were approximately USD67 million i.e. less than 5% of net approvals by the Bank over the period!

The analysis further shows, (see Table 2) that, with the exception of financing for irrigation and drainage, over the period 2000 to 2009, there were substantial declines in CDB’s agriculture sector financing across sub-sectors. This reduction in the agriculture sector’s share of CDB’s lending is not indicative of a shift in priorities by the Bank as CDB remains receptive to requests for support in the agriculture sector and its criteria for financing development projects over the years have effectively remained the same. The marked decline in the demand for agriculture finance from CDB in recent years, therefore, begs the question as to what are the underlying factors which would explain this phenomenon.

**Table 1: Distribution of Loans, Contingent Loans, Equity and Grants Approved by CDB (USD’000)**

| Period       | Net Approvals    | Agriculture Sector | Agriculture Sector Approvals as a percentage of net approvals |
|--------------|------------------|--------------------|---|
| 1970-1999    | 1,741,296        | 275,077            | 15.7  |
| 2000-2009    | 1,611,812        | 67,143             | 4.2   |
| <b>TOTAL</b> | <b>3,353,108</b> | <b>342,220</b>     | <b>10.2</b>   |

**Table 2: Distribution of Loans, Contingent Loans, Equity and Grants Approved by CDB in the Agriculture sector (USD'000)**

| Sub-Sector               | 1970- 1999 | 2000- 2009 | Total<br>1970- 2009 |
|--------------------------|------------|------------|---------------------|
| Crop Farming             | 37,652.00  | 4,299.00   | 41,951.00           |
| Drainage and Irrigation  | 0          | 18,615.00  | 18,615.00           |
| Feeder Roads and Bridges | 36,351.00  | 0          | 36,351.00           |
| Line of Credit           | 150,869.00 | 20,463.00  | 171,332.00          |

**Possible explanations for the decline in demand for CDB financing to agriculture include:**

- The heavy investment by BMCs in the development of agriculture infrastructure and services in the early years of CDB's operation;
- The shift in focus by BMCs away from export agricultural crops like sugar and bananas during the late 1990's in the face of the imminent removal of trade preferences from which these commodities benefitted, especially in Europe and the UK
- The unattractiveness of re-engineering the production of the traditional agriculture export crops and the failure to replace them with viable alternatives; and
- The difficulties encountered in mitigating/transferring the high risks which are inherent in agriculture production.

**The Peculiar Nature of Agriculture Financing:**

Compared with other economic sectors, agricultural financing in the Caribbean presents several challenges to financial institutions, particularly for those who lend directly to entrepreneurs. Generally, agriculture finance is characterized by a large number of small loans (due to relatively small farm sizes in the Caribbean), which necessarily results in relatively high administrative costs for loan appraisal and supervision. In addition many small farmers lack collateral for loan security.

**Agricultural Risks:**

Agricultural production and marketing are relatively high-risk activities. In general, unlike other business ventures, farmers cannot predict with certainty the amount of output. Producers also face market-related risks such as spoilage through inappropriate produce handling; storage and transportation; input and output price volatility; and in the case of traditional markets – foreign exchange risks.

Additionally, the geographic location of most CARICOM Member States presents agricultural producers with another layer of risk. Most CARICOM countries are particularly vulnerable to the effects of tropical cyclones and, increasingly, unseasonal adverse weather-related shocks such as heavy rainfall and drought. In the future the sector is likely to face additional threats resulting from global warming and climate change.



**Impact of Risk:**

The combination of production and marketing uncertainties and the risks associated with adverse weather systems all render the agriculture sector susceptible to high levels of enterprise failure. These losses are transmitted through the value chain to the distribution trade and ultimately to the financial institutions who are exposed to the sector.

The high risk profile of the agriculture sector requires that financial institutions adopt techniques to mitigate the risk of losses from exposure to the sector by limiting the share of the portfolio devoted to this sector; pricing these risks into their lending interest rates; requiring stringent collateral cover for loans and favoring lending which is backed by government guarantees.

Dr. Smith also believes that the reluctance of the Caribbean agricultural sector to embrace new technologies can also be traced to the risk profile of the industry. Whilst relatively simple technologies such as the use of greenhouses can significantly increase expected returns, they also represent a risk of substantial losses due to market issues and the effects of natural disasters. The result is that, with few exceptions, the agriculture sector in the Caribbean is characterized by the use of low cost, often inefficient, technology which ultimately impacts produce quality and consistency of supply.

**In summary, therefore, without adequate measures being put in place to mitigate the plethora of risks facing agriculture, the entire economy is negatively impacted.**

**Making the Agriculture Sector in the Caribbean More Attractive for Investment:**

The absence of adequate risk mitigation strategies is a major disincentive to investment in the agricultural sector. It reduces the demand for finance; constrains the adoption of improved technologies and undermines the bargaining power of agricultural producers' in their contractual relationships with both input suppliers and other segments of the value chain.

We will hear over the course of our deliberations at this symposium that one of the most difficult risk-related issues for Caribbean agricultural producers is the paucity of efficient risk transfer mechanisms. There are very few examples of agricultural insurance available to Caribbean farmers. Thankfully, some interesting initiatives are now underway to begin to redress this deficiency. One such example is the Excess Rainfall product which is being rolled out by the CCRIF, an innovative new entrant into the Caribbean insurance sector, which the CDB, along with other Donors, helped to spawn. Dr. Smith looked forward to the contributions of the impressive line-up of experts on approaches to solving this difficult issue for the Caribbean agriculture industry

In conclusion, Dr Smith thanked the organizers of the symposium for giving him the opportunity to participate in this most important gathering and he wished the organizers and presenters all the very best in the deliberations.

**CURRENT SITUATION AND OUTLOOK FOR AGRICULTURAL RISK MANAGEMENT IN THE CARIBBEAN**  
**DR. VINCENT LITTLE, COORDINATOR - IICA CARIBBEAN REGIONAL AGENDA**

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**Background:**

Characteristics of the Caribbean region with regards to natural and man-made sources of risk as the second most vulnerable of the Small Island Developing States (SIDS) and the Low Lying Coastal States (LLCS) whereby 70% of economic activities takes place within two miles of the coastline, more than 68% of losses are to the social and productive sector, 60% of the population resides in the coastal zone and 70% of all economic activities takes place within 2 miles of the coastline. Also the Region is among the top 10 in disaster proneness index and Financial and economic costs of disasters are high and are expected to increase in light of Climate Change.

Economic damage done to the agriculture sector in some countries of the Caribbean region by selected disasters in recent years as seen in Table 1 and Table 2.

**Table 1: Damage done to the Agriculture sector in the Caribbean.**

| Country           | Disaster                      | Estimated Value (\$US) million |
|-------------------|-------------------------------|--------------------------------|
| Dominica          | Luis, Iris and Marilyn (1995) | 15                             |
| Grenada           | Ivan (2004)                   | 37                             |
| Guyana            | Floods (2005)                 | 54.5                           |
|                   | Floods (2006)                 | 22.5                           |
| St. Kitts & Nevis | Luis (1995)                   | 15                             |
|                   | Dean (2007)                   | 10                             |
| St. Lucia         | Dean (2007)                   | 17                             |

**Table 2: Major Hurricanes in the Caribbean from 1970 – 2008**

| Category of Hurricane | 1970-1979 | 1980-1989 | 1990- 1999 | 2000-2008 |
|-----------------------|-----------|-----------|------------|-----------|
| Category 3            | 9         | 7         | 11         | 10        |
| Category 4            | 3         | 7         | 12         | 12        |
| Category 5            | 3         | 3         | 2          | 7         |
| Total                 | 15        | 17        | 25         | 29        |

Economic cost to the agriculture sector as a result of disasters, particularly Hurricanes, are expected to increase significantly as a result of increased capital accumulation in the sector and the strengthened inter sectoral linkages in recent times. As a result of increased probability of occurrences of severe weather events in the Caribbean, there will continue to be demographic growth and shifts leading to increased levels of persistent poverty if the relationship between Risks <sup>®</sup>, Hazards and Vulnerability (V) not properly addressed in the Caribbean. Risk is a combination of Hazard and Vulnerability with the degree of Hazard and Vulnerability directly proportional to the risk and will determine if a disaster will occur –  $R = f(H * V)$ .

**Current Situation of Agricultural Risk Management in the Caribbean:**

**Institutional Framework:** The region cannot continue to rely on costly extra regional development assistance for reconstruction after a catastrophic event due to declining direct foreign investment for catastrophes as a result of the present and projected weak global economic situation. The institutional framework required to reduce dependence on extra regional development assistance depends on the level of disaster preparedness; the level of Disaster Risk Management and Climate Change Adaptation; and the level of coordination between stakeholders and donor agencies including technical agencies in Risk Management.

**Technical Actions required for enhancing the current institutional framework in the Caribbean region with regards to disaster risk management for the agriculture sector:**

***Institutional capacity building-*** Enhance the culture for Agriculture Risk Management (ARM) at regional, national, and community level by developing the information infrastructure in the agriculture sector; establish an office of chief agricultural risk with a dedicated officer; develop educational and training materials in Risk management for agriculture; develop ARM toolkits; and develop and implement communication/ public awareness programmes for agriculture risk management in the Caribbean.

***Capacity enhancement in preparedness, response and mitigation-*** enhance capacity of technicians in the design and implementation of risk transfer measures by hosting regional symposium on strategy and model for agriculture insurance to facilitate the conduct of national workshop on agricultural insurance with engagement with Caribbean Catastrophic Risk Insurance Facility (CCRIF) to introduce agricultural risk financing mechanisms.

Incorporation of hazard information and disaster risk management measures in the planning process is critical to success in disaster risk management for the agriculture sector. Hence it is important to conduct the following activities in collaboration with Caribbean Institute for Meteorology and Hydrology (CIMH). Urgent need to conduct Drought and flood analysis and monitoring; Seasonal precipitation forecasts; Agro climatic studies; Flood plain mapping; and Development of early warning systems.

In addition, there is an urgent need to enhance capacity to develop protocols and utilize protocols of broad preparedness and mitigation strategies and actions. To effectively utilize protocols, an agricultural natural disaster resource facility consisting of technical resources needs to be established which will also develop standardized methodology for damage and loss assessments and methodologies for efficient recovery and rehabilitation in the agriculture sector. In order to enhance preparedness, response and mitigation, national and local capacities should be strengthened to improve the resilience of the sector to disasters for sustainable attainment of food and livelihood security as seen in Belize, Grenada and St. Lucia.

Also, national and local capacities should be strengthened to improve risk management and land degradation assessments as done in Dominica. In support of CARDI to develop seeds and seedlings bank for critical crops and to conduct research on optimum crop sequencing for the Caribbean region. Strengthening of national and local capacity for damage and loss assessments in the agriculture sector is critical for an effective Agriculture Risk Management programme. The conduct of regional and national training events in Damage Assessments and Loss assessments (DALA) Methodology will be supported by both IICA and ECLAC, and both agencies will continue to support damage and loss assessments assignments as requested by the member states in the Caribbean region.

***Emergency assistance provided in the management of Invasive Species-*** Generate information on the diversity, ecology, and evolution of the h1n1 virus and strengthened field surveillance and laboratory systems to ensure detection and diagnosis.

***Reduction of Praedial Larceny-*** by review of the state of praedial larceny in the region; promotion of implications of Praedial larceny to national economies by public awareness programmes and the support in the Institutionalization of farm record keeping by the promotion of farm registration systems nationally and regionally.

### **Outlook for Agriculture Risk management in the Caribbean region:**

Effective risk management systems are very important for poverty prevention/reduction, particularly at the rural communities and hence disaster risk management systems for agriculture in the Caribbean region should be implemented by the government. Improvement in the investment environment can be achieved when banks are more likely to lend with proper risk management systems in place for the agriculture sector. Unfortunately, disaster assistance has been used as political tool; it has been proven to be expensive and ineffective, hence the urgent need to develop and implement a risk management system proven to work on a global basis. World Health Organisation (WHO) has developed a unique risk management system to address food security and consists of Six Broad points - sustainable structures (building resilience); risk identified; monitoring; early warning; public awareness (promotion of knowledge and innovation); technical and physical mitigation.

In order to effectively implement Risk management for agriculture in the Caribbean, the following six elements of good disaster management practices should be pursued in the short to medium term.

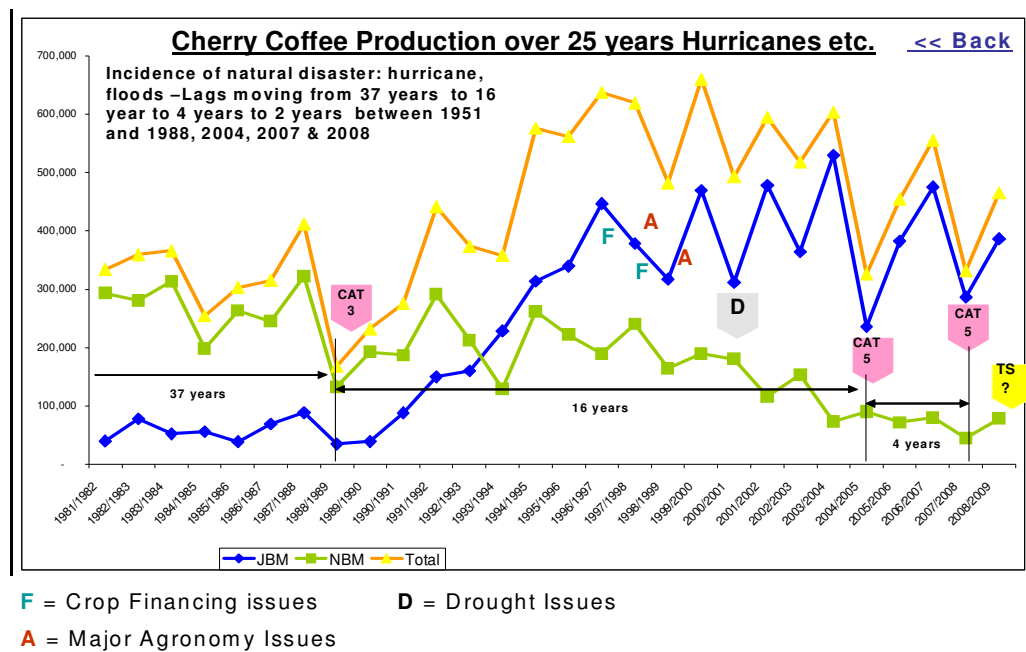
1. Support sustainable institutional structures and good governance by capacity enhancement
2. Promote risk identification, monitoring, and early warning programmes for the agriculture sector in the Caribbean region.
3. Promote and support the improvement in capacity of technical and physical risk mitigation,
4. Building resilience in the agriculture sector by promotion of innovative, knowledge and public awareness of the agriculture sector
5. Design and implement Risk sharing and risk transfer mechanisms for the agriculture sector and;
6. Encourage capacity enhancement in preparedness, effective response and sustainable recovery for the agriculture sector in the Caribbean region.

**TOWARDS AN AGRICULTURAL RISK MANAGEMENT FRAMEWORK FOR THE CARIBBEAN**  
 CARLOS ENRIQUE ARCE, AGRICULTURE RISK MANAGEMENT TEAM, AGRICULTURAL AND RURAL  
 DEVELOPMENT DEPARTMENT, THE WORLD BANK (WB)

Five years ago the WB started broadening its scope of work and is already advising countries on wider agriculture risk management. Most recently, Jamaica received technical and financial assistance to develop a Draft Agricultural Risk Management programme and the presentation is based on the experience of the WB in Jamaica.

The Caribbean Agriculture has a high risk of exposure since there are risks and uncertainty widespread throughout the food/ agricultural system, such as agro-climatic factors, complex biological/ environmental processes among others. There have been major structural and demographic changes throughout the region that have contributed to the risks. In addition to the typical (“old”) risks such as weather and policy shifts, there are now new risks occurring such as climate change, new disease transmissions, Biosafety, bioterrorism, environmental imprint and social concerns.

Figure 1. Production for Blue Mountain and of Jamaican coffee.



Note: X axis = years; Y axis = boxes of production; JBM = Jamaican Blue Mountain; and NBM = Non Blue Mountain (Low lands)

Agriculture as stated before is sensitive to risks as seen in figure 1. Major risk of importance to Caribbean agriculture are risks related to issues such as crop and livestock financing issues; drought issues; major agronomy issues; major animal husbandry issues; and natural disasters such hurricanes and earth quakes. Generally over the past five years, the Government of Jamaica and Donors have spent a yearly average of US\$1.5 – 2.0 million in post disaster support in response to agriculture yearly losses of US\$52 million.

The Current Catastrophe Risk Management System in Agriculture in the Caribbean region as reflected in Jamaica is not efficient or effective. The catastrophe coverage for small vulnerable farmers is ex-post and the system is slow

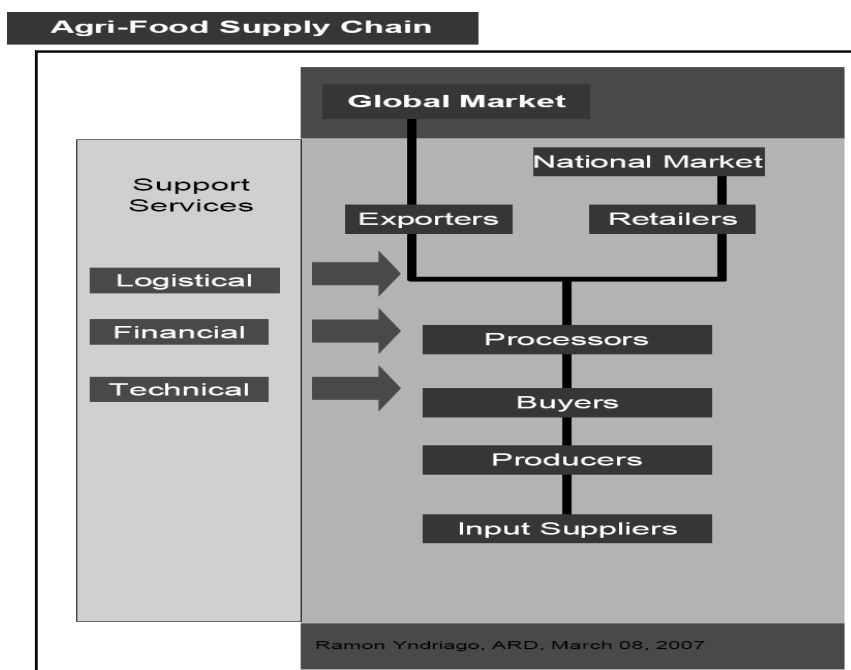
to respond, especially for small farmers. The Commodity Boards and/or individual farmers have no instrument for transferring risks, hence, very high vulnerability to natural disasters.

### The Components of a Risk Management Framework for Agriculture:

In order to achieve a sustainable Risk Management Programme for the Caribbean the following components are recommended:

- Identification of Objectives / target – for example the traditional or emerging farming sector or the commercial or subsistence farming sector
- Assessment of Agricultural Risks – for example, risk identification, risk quantification, vulnerability assessments and risk prioritization
- Risk Management Strategy – to include Prevention, Transfer and Coping. Coping Mechanism also important – farmers have coping mechanism in place such as savings and assets – public sector needs to handle the great risks that would lead the farmers into poverty
- Resources – such as data management, regulatory/supervisory framework, information and education, technical expertise, programme administration and leadership, and programme monitoring.

### Supply Chain Risk Assessments vs Farmers Risk Assessments



- **MOTIVATIONS**
  - Multiplicity of risks impacting farmers and agro-enterprises
  - Patterns of risk transmission; also distribution of risks
  - Interventions at one level may have impacts elsewhere
  - Scope for complementary measures and partnerships
  - Consider scope/costs/benefits of alternative Risk Management approaches
  - “Supply Chain” as unit of analysis to understand interdependencies

- **APPLICATIONS**

- Inform value chain competitiveness
- Prioritize focal risks and entry points for interventions—project Identification
- Input to sectoral reform processes
- Input to agricultural finance planning

When considering the measures for a Risk Management Framework, such as identification of risks, risk mitigation, risk transfer tools and risk coping mechanisms, most often the list proposed as risk mitigation mechanisms tends to be longer than any of the others, and very often financed exclusively by the Public Sector.

### Illustration of Measures for a Risk Management Framework

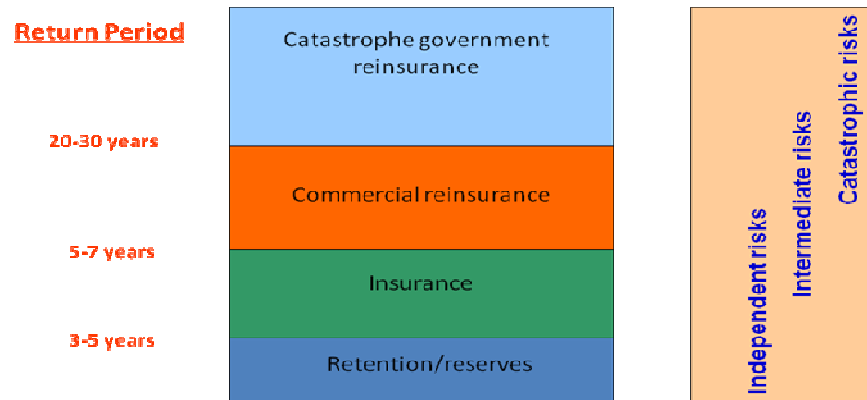
| Identified Risks                             | Proposed Risk Mitigation  | Proposed Risk Transfer Tools         | Proposed Risk Coping   |
|--|---|--------------------------------------|--|
| Flood Risk                                   |   |                                      |  |
| 1. Due to inadequate drainage infrastructure | <ul style="list-style-type: none"> <li>• Invest in new infrastructure</li> <li>• Improve conservancy capacity</li> <li>• Upgrade existing infrastructure</li> <li>• Repair existing infrastructure</li> <li>• Invest in drainage equipments (e.g. dredging equipments &amp; pumps)</li> </ul> |                                      |  |
| 2. Due to excessive rainfall                 | <ul style="list-style-type: none"> <li>• Early warning system</li> <li>• Improved metrological infrastructure</li> <li>• Invest in weather forecasting and dissemination mechanism</li> <li>• Flood hazard mapping</li> <li>• Flood resistant rice varieties</li> </ul>                       | Crop/weather insurance (if feasible) | Better national coordination mechanism for flood management<br><br>Flood management protocol |
| 3. Due to water management issues            | <ul style="list-style-type: none"> <li>• Capacity building</li> <li>• Performance management</li> <li>• Improved user (farmer) involvement in management</li> <li>• Improve water management systems and processes</li> </ul>   |                                      |  |

### Identifying the role of the Public Sector:

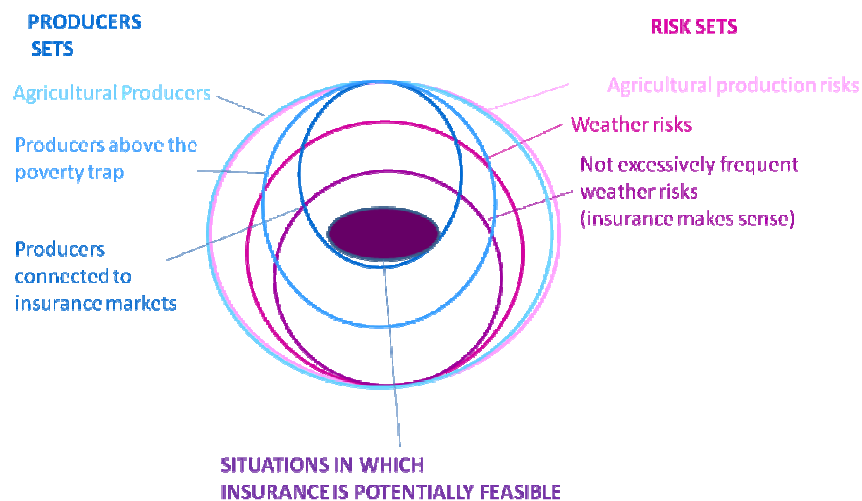
1. Assuming Catastrophic layers in an ex-ante approach
2. Provision of Services and investments for risk mitigation.
  - Agriculture Research & Extension
  - Sanitary & Phytosanitary Services
  - Pest Controls,
  - Drainage, flood gates, etc
3. Investments for supporting private sector initiatives
  - Weather data reliability and access
  - Access to reliable agronomic information
  - Access to financial agro information
  - Training in areas such as meteorology, data management, etc

4. Improving delivery channels to support small farmers after adverse catastrophic events.
  - Transparency
  - Efficiency
  - Accountability
5. Adaptation to climate change

There is a need to adopt a Layered Risk Transfer Structure.



There is also a role of Insurance in a wider Risk Management Approach.



#### Regional as Opposed to Country Risk management:

When considering Risk Management some risks are better managed at the regional level as opposed to the national level. These risks would include sanitary and Phytosanitary issues, hurricanes etc). Other risk are much more country specific (logistic disruptions, price risk, exchange rate, flash flooding, droughts, Prædial larceny, etc). Transferring agricultural weather risks at regional level requires that the following key challenges are met:

- Quantifying “ regional” agriculture exposure
- Defining trigger payouts
- Institutional delivery channels



**Key messages/salient points:**

- Need to design a comprehensive Regional and/or Country Risk Management Strategy (RMS) for Agriculture.
- This RMS may include Mitigation- Transfer – Coping mechanisms and tools.
- Risk Layering and Risk Financing are important
- Ex Ante is better than Ex-Post
- Define clear role of public sector
- Supply Chains Versus Farmer level risks
- Agricultural Insurance will play an important role, but it is only part of the Strategy

## SESSION 1: FACILITATED PLENARY DISCUSSION

Panel: Ms. Elizabeth Riley – CDEMA; Dr. Warren Smith – CDB, Dr. Vincent Little – IICA;  
Mr. Carlos Enrique Arce – World Bank, Mr. Ramiro Iturrioz – World Bank

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### Questions / Interventions:

**Caribbean Farmers Network - CAFAN (Chief Coordinator):** Enabling environments are essential. Unless we put the enabling environment (CDB WB) in place it will not work.

**CARDI - Strategic Alliance:** Problems - CDEMA expects risks and farmers should be prepared. The WB said that insurance will not insure with much risk, therefore, we need to do our part to reduce risk, for example, improving farming practices etc. With regards to spreading the risk, this can be done regionally. These ventures will spread the risk to entice the insurers. It is difficult to work without government support – the results of this meeting should go to COTED.

**Minister Walters (Minister of Agriculture, Dominica):** The Minister of Agriculture in Antigua/ Barbuda indicated in the opening ceremony that we should not reinvent the wheel in the region. There are buffer mechanisms that have operated before, they can be revamped or remodeled, for example, WINCROP, could be one that could be remodeled.

Whether there are workable success stories that can be replicated in the Caribbean is it possible to transform WINCROP to an agency that can help compensate farmers regionally?

### Panel Response:

**Carlos Enrique Arce:** At the World Bank, there is more interest in agricultural sector not only on the policy side but on the conceptual side, we are looking at enabling environment. There are issues to food security and lending to the agricultural sector has been increasing i.e. lending to government in order to provide services for agriculture--- revision ongoing – role of public sector debating – government already putting in place tools for sustainable food security. Challenging to put in place insurance for individual farmers but may be able at the aggregate or commodity level for insurance.

**Ramiro Iturrioz:** Insurance is not the solution for everything. Other issues should be solved ---- in the case of best practices – several things have to be in place, farmers have to be knowledgeable ---- insurance is the last link.

**Dr. Warren Smith:** The presentation was a broad sweep, recently re-emergence of technologies in vegetable production – green production, -- linking to dramatic difference. CDB does not lend directly to a farmer, works through Development Financing Institutions throughout the region, but they are becoming weakened and not able to function so CDB has to work with them to help them be financially sound. There is a need for greater resilience in the industry, financially viable industry.

***SESSION 2:***  
***Public Sector Strategies in Managing Risk***

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Chair: Ms. Elizabeth Riley  
Caribbean Disaster and Emergency Management Agency (CDEMA)

**Challenges to the Sustainable Development in the CMO Member States:**

- Small climate sensitive economies that often lack significant diversity and are susceptible to economic shocks;
  - Agriculture and service based economics with the exception being Trinidad and Tobago which has a petroleum based economy
- Inter-related economies;
- Many small island states with small populations that are predominantly coastal;
- Many states have low GDPs and small tax bases
- Several water scarce islands
- Complex inter-related environmental hazards and highly vulnerable populations
  - Hazards include hurricane, drought, flood, earthquake, tsunami and landslides among other and the region’s susceptibility to climate change and climate variability.

Over the last three decades, the Caribbean region has suffered direct and indirect losses estimated at between USD 700 million to USD 3.3 billion due to extreme weather events; and the World Bank in a 2009 report determined that the cumulative annual impact of future climate change on all CARICOM Member and Associate Member States by ca. 2080 will be approximately USD 11.2 billion which represents 11.3 percent of the projected cumulative GDP of USD 99.3 billion (all estimates referenced to 2007 USD prices).

The most significant contributors to the future annual cost of impacts are expected to be direct losses due to climate change related disasters USD 4.9 billion (of which USD 2.6 billion are expected to result from wind storm damage, USD 363.2 million from flood damage and USD 447 million from loss in tourism revenues) and loss of tourist expenditure due to temperature rise which is expected to be approximately USD 4 billion.

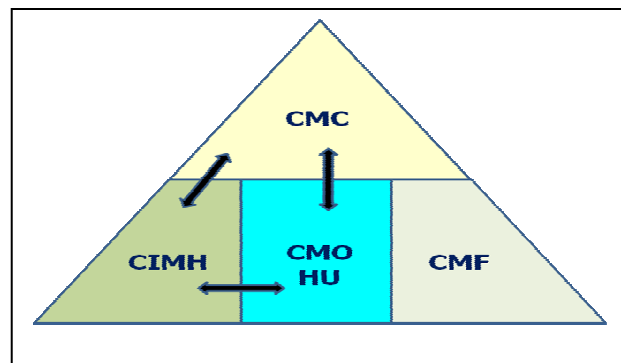
**SUPPORTING RISK REDUCTION AND SUPPORTING SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT MUST BE THE FOCUS OF CMO**

**Caribbean Institute for Meteorology and Hydrology (CIMH):**

**Organisational Background**

Caribbean Meteorological Organisation Organs

- Caribbean Meteorological Council (CMC)
- Caribbean Meteorological Organisation – Headquarters Unit (CMO-HU)
- Caribbean Institute for Meteorology & Hydrology (CIMH)
- Caribbean Meteorological Foundation (CMF)



**Mandate of Caribbean Institute for Meteorology & Hydrology (CIMH):** To assist in improving and developing the Meteorological and Hydrological Services as well as providing the awareness of the benefits of Meteorology and Hydrology for the economic well-being of the CIMH member states. This is *achieved through training, research, investigations and the provision of related specialized services and advice*".

**History of Caribbean Institute for Meteorology & Hydrology (CIMH):** Caribbean Meteorological Institute (CMI) established August 23, 1967 under special funding from UNDP and WMO with 16 Caribbean States that comprise the Caribbean Meteorological Council were entrusted with the responsibility of managing CMI. CMI becomes affiliated with UWI in 1973 and a B.Sc. in Meteorology was established in Faculty of Natural Sciences. CMI designated by WMO as a Regional Meteorological Training Centre in 1978 (new designation RTC) and the Caribbean Operational Hydrology Institute (COHI) established in 1982 and located at CMI ... COHI subsequently brought under CMI in 1987. The name of CMI changed to Caribbean Institute for Meteorology & Hydrology in 1999.

**CMC member states:** Anguilla, Antigua and Barbuda, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts/Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago and the Turks and Caicos Islands.

#### **Primary Functions of CIMH:**

1. Train various categories of meteorological and hydrological personnel
2. Operate as a centre of research in meteorology, hydrology and associated sciences
3. **Data collection, storage, & dissemination** - Challenges to Data Archiving at CIMH were considered, for example cost and failure of some countries to digitize data. An example was given where, one country lost all their data in a fire in 1992, if that data was continually sent to CIMH, then the information could have been safely accessed. Meteorological Data Archiving in the Caribbean was shown to be essential. Why collect and archive? What is the importance of archived data?
  - assists in better understanding of the climatology of the region to support sectoral planning (e.g., agriculture, water resources planning, insurance, etc)
  - provides support for global climate databases (e.g., GCOS)
  - provides support for engineering designs (e.g., drainage design to support flood mitigation)
  - allows of environmental change detection
  - Supports design of alternative systems and energy mix.
4. Maintain, repair, and calibrate meteorological & hydrological instruments
  - Regional Instrument Calibration Laboratory
  - Establishment of the instruments calibration lab established in 2007
  - Sea Level Monitoring and Equipment Maintenance
  - CIMH currently involved in redevelopment of sea level monitoring stations across the Caribbean
  - CIMH will be responsible for maintenance of several of these stations
  - Support for International Research and Development Projects (NASA, U. Miami, Max Planck Institute and CCCCC) -Instrument installation (lidar and small radar systems) and Monitoring and Maintenance
  - Regional Maintenance/Support -CIMH continues to support requests from regional meteorological office and governments

- Research and Development - Developed a data-logger and rain gauge recording system (hardware and software customizable to client needs)
- 5. Advise regional governments on matters related to meteorology & hydrology
- 6. Provide consulting services to industry

#### **Evolution of Climate Data Gathering in the Caribbean:**

Historically primarily precipitation data were collected by the agricultural community. Twenty-four hour rainfall datasets can still be found in most countries with a fairly good spatial distribution of measuring stations. However, the remaining data often remain on paper records.

National Meteorological and Hydrological Services often manage few stations with often poor spatial resolution. Underfunding often limits the temporal resolution of these datasets. Much of the historical data is in the form of paper records where several meteorological parameters measured. Generally, the Data is often of sufficient quality to be entered into global climate databases, but the Quality management systems are weak.

Miscellaneous Stakeholders in the National Ministries; Private companies; Systems set up for specific purposes which limits the use of the data; and Data often difficult to get a hold of.

#### **Data Availability:**

Sources of DATA- National Meteorology and Hydrology Services remain the primary sources of data in each country due to the following:

- Widest variety of data
- Collection net work is often spatially limited
- Reliance on other stakeholders for data
- Historical data often in hard-copy form making it difficult to use
- Robust Quality Management System often not enforced

Data is often gathered from other government ministries

- Ministries of Agriculture and Environment often manage climate and environmental data collections and databases
- Often these data are not contributed to the national database controlled by the agencies but in some cases may be acquired on request
- Robust Quality Management System often not enforced
- Collection systems may not often meet WMO standards and, as a result, the data cannot be contributed to international climate databases

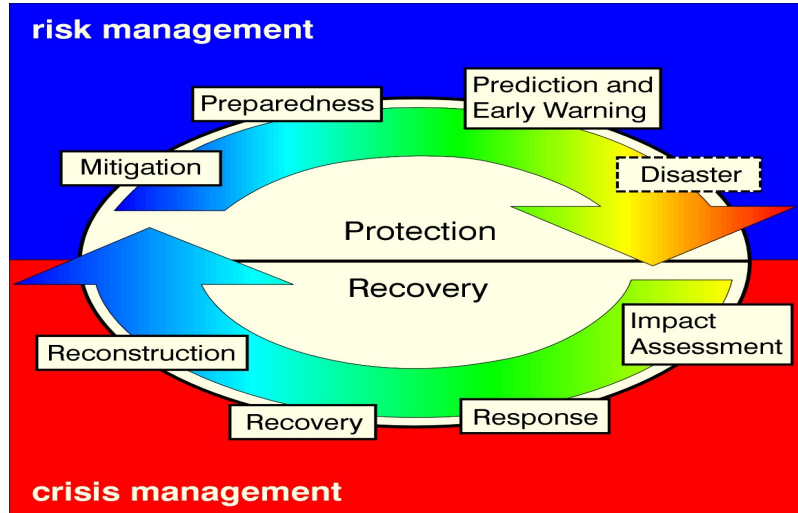
Corporate Entities and NGOs remain the secondary sources of data due to small networks which may not conform to WMO standards and poor information as to the existence of the network. Very often the Data is not often shared.

#### **Challenges to DATA Archiving at CIMH:**

- Failure of several countries to archive data at CIMH
- Costs associated with data collection and archiving systems

- Data collection, archiving and quality assurance at CIMH is approximately USD 250,000.00
- Most of these costs are not recoverable
- As more databases are added costs will increase
- Sustainability of the system is susceptible to budgetary shortfalls at CIMH
- A more strategic approach to data collection, archiving and quality assurance at CIMH, particularly in the data rescue of hard copies to electronic data.

**The Cycle of Disaster management**



**Weather and Climate Forecasting and Monitoring Systems:**

**Short Term Forecasting:** this may prepare farmers for days of heavy rain or days of severe heat which may determine plan of action. Up to seven days as produced by national Weather Services and may include information like - Tuesday Partly cloudy with some scattered showers mainly during the morning 31/26°; Wednesday Fair to partly Cloudy with some scattered showers. 31/26; Thursday Cloudy with scattered showers 30/25°; and Friday Cloudy with scattered showers.30/25.

**Regional Radar coverage important for planning:** very important for planning

**Tropical Cyclones/Strong winds Predictions:** Agricultural losses from strong winds and flooding and for some crops can have severe damage from winds of tropical depression strength – DOES NOT NEED TO BE A MAJOR HURRICANE.

**Advanced Flood Forecasting:** Weather Research Forecasting Model- Outputs: atmospheric variables at all levels of the troposphere; the state of the atmosphere at different times in the future and a Forecasting tool which provides simulations on different spatial scales, Real-time forecasting out a fortnight, and can be altered to better represent the tropical atmosphere to give Regional climate scenarios. HydroGeoSphere (Hydrological Model) - Outputs: Water depths; SW/GW flows; GW saturations; Concentrations and can be used as a Water resources management tool to determine Flood forecasting; simulate impact of contaminant transport; Simulate climate change scenarios; and provides real time monitoring.

**Seasonal Forecasts:** Seasonal rainfall outlook produced every two months for a lead time of three months and to be enhanced through the Re-establishment of the Regional Climate Outlook Forum, 21-23 June, 2010 Barbados. Not only rainfall, but includes temperatures and sea conditions, hurricane season etc. Outlook/forecast also used to aid in other forecasts like drought. For example the Caribbean Drought and Precipitation monitoring Network.

| Station                 | 1 mth         | 3 mths        | 6 mths        | 12 mths       | Probability |
|-------------------------|---------------|---------------|---------------|---------------|-------------|
| CIMH<br>Barbados        | 0.39 - 1.72   | -0.34 - 1.98  | -1.64 - -0.13 | -1.10 - -0.28 | 30          |
|                         | -0.44 - 0.39  | -1.59 - -0.34 | -2.17 - -1.64 | -1.35 - -1.10 | 45          |
|                         | -2.04 - -0.44 | -3.54 - -1.59 | -2.65 - -2.17 | -1.55 - -1.35 | 25          |
| Point Saline<br>Grenada | 0.41 - 2.67   | -0.32 - 2.54  | -2.23 - -0.20 | -3.04 - -1.92 | 30          |
|                         | -0.43 - 0.41  | -1.48 - -0.32 | -2.59 - -2.23 | -3.19 - -3.04 | 45          |
|                         | -1.27 - -0.43 | -2.74 - -1.48 | -2.83 - -2.59 | -3.28 - -3.19 | 25          |

**SEVERE DROUGHT CONDITIONS TO CONTINUE OVER GRENADA FOR THE NEXT THREE MONTHS**

Severe drought conditions currently being experienced over Grenada are expected to persist over the next 3 months. This is the view of scientists from the Caribbean Drought and Precipitation Monitoring Network (CDPMN) based at the Caribbean Institute for Meteorology and Hydrology, Husbands, St. James Barbados, who have been analyzing rainfall trends in the Caribbean since January 2009.

Analyses show that severe drought conditions were experienced in Grenada for the year 2009, with particularly, the last 3 to 6 months being extremely dry. This is believed to be responsible for an increased demand for irrigation water, a reduction in stream flow and a general depletion in water resources.

Forecast models currently indicate that for the period January to March 2009, below normal conditions will persist over the southern portion of the eastern Caribbean exacerbating the environmental impacts, and in particular extending drought conditions for a further 3 months.

For more information about the rainfall outlook and the CDPMN for Grenada and the region please visit <http://www.cimh.edu.bb/curprecip.htm> and <http://www.cimh.edu.bb/precipindex.html> respectively.

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Prepared by:

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**Climate Change forecast:** Increases in temperature; Decline in rainfall totals of up to 15 to 20 % by 2100; more intense rainfall events; Saline intrusion into water supplies and salinization of soils; and increased number of major hurricanes. All of concern to agricultural risk management.

Some impacts of the 2009/2010 drought - 25 % loss in onion crop; 30 % loss in tomato crop in Antigua; Prices of Tomatoes rose from \$2.35/ pound in Feb 2010 to \$6.00/ pound in Mar 2010; Hydro power contribution in St. Vincent dropped from 28.69% in Feb 2009 to 12.01% in Feb 2010; Flow at Mirabeau, Grenada was 60 % below



average; In Trinidad Caroni Arena lake 29.46 % of capacity; in Trinidad because of lack water for sanitation of livestock cases of Mastitis; as of February 22nd the Mona Reservoir was down to 40% of capacity while the Hermitage Dam was down to 34% of capacity; and there were record bush fires all across the Caribbean.

***Comprehensive weather and climate related EARLY WARNING SYSTEM:*** longer term goal. Developing a culture of monitoring weather and climate activity in the Caribbean region will contribute significantly in managing agricultural risk in the region.

The Caribbean Agro Meteorological Initiative (CAMI) was introduced. It is funded by the EU ACP Science and Technology programme. The overarching objective of the Action of CAMI is to increase and sustain agricultural productivity at the farm level in the Caribbean region through improved applications of weather and climate information using an integrated and coordinated approach. CAMI will provide training for meteorologist and agricultural extensionists – to improve package information for end users.

Synergies and partnerships are the way forward as reflected in the Partnership between CIMH (Applicant), WMO, CARDI, ten Meteorological Services. The total cost of the Action is estimated at **1,112,714.40 EURO** and the Contracting Authority undertakes to finance a maximum of **720,388.20 EURO**, equivalent to **64.74%** of the estimated total eligible cost of the action. The ten participating national meteorological services are Guyana; Trinidad and Tobago; Grenada; St. Vincent and the Grenadines; Barbados; Dominica; St. Lucia; Antigua and Barbuda; Jamaica; and Belize.

**Specific ACTIVITIES OF THE ACTION:**

- Development of predictors of the rainy season potential characteristics through analysis of long-term climatic data and use of seasonal to inter-annual climate prediction models
- Interpretation of the climate predictor and near-real time weather information to support management decisions, especially irrigation scheduling
- Working with the agricultural research and extension agencies in developing an effective pest and disease forecasting system
- Preparation and wide diffusion of a user-friendly weather and climate information newsletter for the farming community
- Organisation of regular forums with the farming community and agricultural extension agencies to promote a better understanding of the applications of weather and climate information
- Building capacity of the Meteorological and Agricultural Services and research institutions

## INFORMATION STRATEGIES TO FACILITATE CARIBBEAN CATASTROPHIC AGRICULTURAL INSURANCE DATABASE – GRIDDED ANALYSIS OF METEOROLOGICAL VARIABLES FOR GUATEMALA AND HONDURAS

MR. EDGAR URIBE  
THE WORLD BANK

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This project was prepared at the request of the World Bank for supporting agriculture insurance development in Central America. The purpose of project: One of the major constraints for the development of agricultural financial management is the lack of meteorological information usually associated with

- Limited coverage of stations
- Missing data in the historical records
- Short historical record (e.g. recently installed stations)
- Quality issues

The Proposed Solution:

- The use of objective analysis (i.e. regular grids, Uribe Alcántara et al., 2009).
- The gridded datasets are generated with a successive correction method (Cressman, 1959) based on two predictors:
- Primary: Meteorological stations
- Secondary: The North American Regional Reanalysis (NARR) from NOAA (Mesinger et al., 2006)

Benefits of objective analysis (gridded data sets):

- Integration of all existing data in a given day (i.e. partial missing records do not restrict the analysis of meteorological stations)
- Complete historical records for all the pixels within the domain
- Simplified association of meteorological fields with spatial features (e.g. assets, political boundaries, topography, land use, etc.)

Components of the Study;

- **Feasibility Analysis:** Consistency and quality control to define the feasibility and characteristics of the regular grids.
- **Gridded Analysis:** Methodology, results and evaluation and applications of regular grids of precipitation, maximum and minimum temperatures, evapotranspiration, and solar radiation.
- The methodology has been applied to both Guatemala and Honduras (Nicaragua is in development).

### First Stage: Feasibility Analysis

**Data base Consistency:** The original databases are obtained from the local weather services (e.g. INSIVUMEH for Guatemala, and SMN and SERNA for Honduras) and are checked for coherence and consistency (e.g. consistent missing-data flags, valid dates, consecutiveness, duplicated but different records for the same date and meteorological station, etc.). The purpose is to prepare the individual time-series of the meteorological stations for the analyses. “In Honduras, around 69% (16,285) of the original precipitation records were eliminated without impact on valid records (on average, porosity remained below 25% for precipitation, 20% for maximum temperature, and only 5% for minimum temperature)”.

**Quality Control:**

- Inconsistencies - Meteorological data has natural trends associated to climatic variability (e.g. low temperatures during the winter, high temperatures during the summer). Whenever a **trend is not consistent with either the season or the rest of the years**, the pattern is regarded as erroneous and removed from the dataset.
- Outliers - The largest(s) value(s) clearly outside the normal range of variation of the variable are removed.
- Illogical values - The database is tested for illogical values (e.g. **negative precipitation and TMAX < TMIN**).

**Final Databases – highlights:** Guatemala - “The quality control prevented the inclusion of 18 meteorological stations containing erroneous data (around 35% of the met stations with reports). Approximately 8% of the records were removed after the quality control.” In Honduras - Only one meteorological station was eliminated for falling outside Honduras; 155 records of TMAX and TMIN, and 944 of precipitation, are corrected.

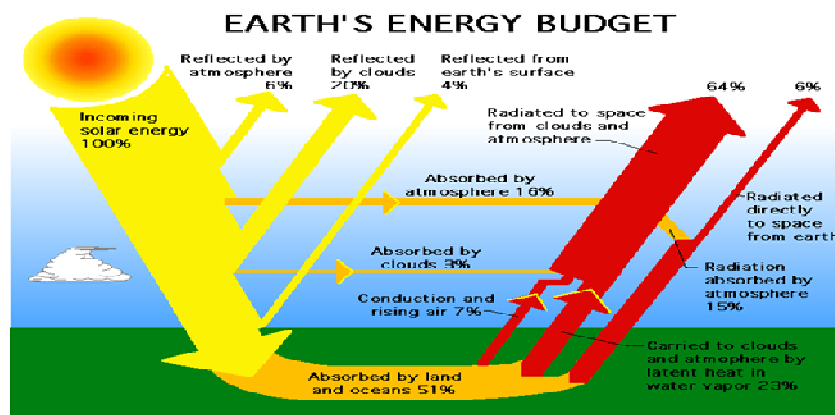
**Feasibility Analysis** - The most important factor is the percentage of valid records, and the spatial distribution of the meteorological stations. Characteristics of the gridded datasets are also very important as the estimation of the pixel size takes into account the continental surface of the region of interest, and the number of stations as seen in the following table.

**Table 1: Characteristics of the gridded datasets:**

| Element                       | Guatemala                                 | Honduras (Precipitation)                 | Honduras (rest of the variables)          |
|-------------------------------|---|--|---|
| Pixel size                    | 0.15° (~16km)                             | 0.08° (~9km)                             | 0.24° (~26km)                             |
| Background Field              | NARR                                      |  |   |
| Temporal Resolution           | Daily                                     |  |   |
| Number of scans               | 5   |  |   |
| Scan Radii (pixels)           | 5, 4, 3, 2, 1                             |  |   |
| Scan Radii (degrees)          | 0.75°, 0.60°, 0.45°, 0.30°, 0.15° (~16km) | 0.40°, 0.32°, 0.24°, 0.16°, 0.08° (~9km) | 1.20°, 0.96°, 0.72°, 0.48°, 0.24° (~26km) |
| Initial date                  | January 1st, de 1979                      |  |   |
| Final date                    | December, 31st, 2008                      |  |   |
| Geographical Reference System | Geographical                              |  |   |

**Second Stage: The Gridded Analysis:**

Four methodologies were used and were as follows:



1. **Cressman methodology** - Cressman (1959) is a successive weighted correction of a preliminary field (e.g. atmospheric models, satellites) based on observations. Cressman is iteratively applied to the analysis previously obtained but with successively shorter scanning radii. North American Regional Reanalysis (NARR) is used as a **preliminary field** (second predictor). NARR is a long-term, dynamically, consistent, **atmospheric and hydrologic database**, with high spatial and temporal resolutions, generated with the numerical weather model ETA (<http://www.emc.ncep.noaa.gov/mmb/rrean/>).
2. **Evapotranspiration (ET)** - The selection of the method is usually constrained by the information available. In these cases, the method selected for the estimation of ET is Hargreaves, which depends only on the following parameters: 1) latitude, 2) Julian day, 3) maximum temperature, and 4) minimum temperature.

ET is estimated based on the gridded datasets. Hargreaves estimates the ET for a crop of reference (evaporation rate of a pasture with a fixed height of 0.12m, an albedo of 0.23, and a superficial resistance of 69).

$$ET = 0.0023 \cdot R_{ext} \cdot (T_{max} - T_{min})^{\frac{1}{2}} \cdot (T_{ave} + 17.8)$$

3. **Solar Radiation** - The method consists simply on the **estimation of daily solar radiation** reported in NARR **from the three-hourly reports** of the average downward shortwave radiation flux at the surface. The Land Surface component of the model performs a **heat budget** based on the different components of energy. Solar radiation is affected as it moves through the atmosphere so the impact of clouds is implemented.
4. **Skill Scores** - Evaluation based on Hofstra (2008). Compound relative error (CRE): A measure of Mean Square Errors (MSE) relative to the variance of the observations. Mean Absolute Error (MAE): A measure of average error. Root Mean-Squared Error (RMSE): One of the most common measures of error. Correlation coefficient (R): A measure of the ability to model variability in time. Proportion Correctly Predicted (PC): A measure of the percentage of correct predictions of wet and dry days. Critical Success Index (CSI): A measure similar to PC but more appropriate for the determination of accuracy in the prediction of wet events.

Sample results in Guatemala - analysis of precipitation on June 19<sup>th</sup>, 1979. Both maps are overlapped with data from stations. Sample results in Honduras - Analysis of precipitation on November 1<sup>st</sup>, 1998. Both maps are overlapped with data from stations. Representative climatologies for all the variables are estimated and compared to independent sources (e.g. MAGA and CRU), whenever possible. For solar radiation methodology, **two methodologies were applied**: Kumar et al., 1997 (green dots), and NARR (black circles).

There was no independent climatology of SR available for comparison and NARR is considered the best method for being capturing the effect of clouds. Global skill scores for the whole database were **better than similar scores in Europe and Mexico** (Hofstra, 2008). Visual inspection of extreme events is the most effective methodology because a picture is worth a thousand words and numbers.

#### Applications of Objective Analysis:

1. Synthetic Series (fill-in missing data) - Missing data in the meteorological stations are filled in with data from the gridded datasets.
2. Crop - hydraulic and hydrological modeling
3. Climatologies - Maps of climatologies and Annual cycles are useful as a quick-reference.

4. Hazard and Risk Maps - Gridded datasets can be used to generate useful information on hazards that can be cross-referenced with exposure and vulnerability to generate map risks.
  5. Regional Climate Change Scenarios
  6. Climatological Seasonal Forecasts
  7. Climate Regionalization (determination of climatologically homogenous regions)
- Graphical User Interface (GUI) - The gridded analyses result in tens of millions records. Therefore, a friendly GUI was designed to perform data queries.

**Summary and Conclusions:**

- The consistency check of the Honduran database illustrates the danger of taking data from weather services on an “as is” basis, and it confirms the need of a, sometimes unexpectedly arduous, process.
- The gridded datasets were considered feasible although the resolutions were different for both countries and, in the case of Honduras, for different variables. The resolutions range between 0.08° (~9km) and 0.24° (~26km).
- Climatologies are in agreement with independent sources. The evaluation indicates superior quality than similar datasets in Europe and Mexico.
- Gridded datasets imply smoothing of the original observations. However, risk analysis is more concerned with capturing the probabilities of losses than the exact magnitude of catastrophic events.
- Based on the evaluations and similar experiences, the use of the gridded datasets, and their sub-products, is considered appropriate to support the development of risk management schemes in Guatemala and Honduras.

## SESSION 2: FACILITATED PLENARY DISCUSSION

Panel: Dr. Adrian Trotman – CIMH; Mr. Edgar Uribe -World Bank

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### Compiled Comments from audience:

- Call for educating end users effectively
- Transfer of weather information to end users
- Implementation of data collection and data storage
- Ability to provide accurate information to advise farmers e.g. Drought forecast and pest outbreak

### Responses:

- Critical importance of fact based decision making.
- Application of science, technology and applied research for decision making
- Recognition of levels of uncertainty with science and technology.
- Reiterate need of countries to support archiving of data -- act as a repository of information - assist in the decision making process
- strengthening of institutional arrangements at the national level and improve communication of all stakeholders
- recognize ongoing initiatives of CARICOM secretariat, especially Agricultural Policy

***SESSION 3:***  
***Public Sector and Enabling Conditions for Agricultural Risk Financing***

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Chair: Mr. Jedidiah Maxime  
Ministry of Agriculture, Lands, Housing and the Environment  
Antigua and Barbuda

**PROOF OF CONCEPT FOR INDEX-BASED INSURANCE IN THE CARIBBEAN AND POTENTIAL CATALYST FOR RISK MANAGEMENT INNOVATION IN THE AGRICULTURE SECTOR**

SIMON YOUNG

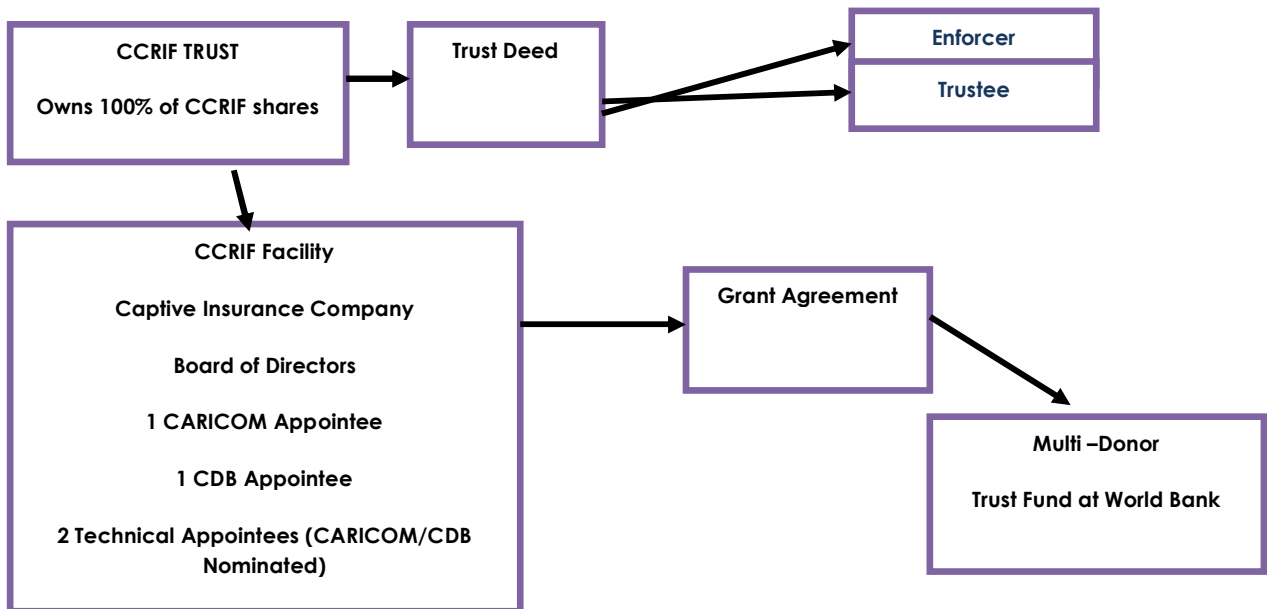
CHIEF EXECUTIVE OFFICER, CARIBBEAN RISK MANAGERS LTD, FACILITY SUPERVISOR, CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY (CCRIF).

**History of CCRIF:**

Pooled re/insurance solution for Caribbean governments first called for by CARICOM Working Party on Insurance after Hurricane Andrew ('92) when US\$250 million in damage in Bahamas alone was incurred. Revived in 2004, after Hurricane Ivan inflicted almost 200% of GDP damage on Grenada and the Cayman Islands and all parties identified the high exposure of small island economies across the region to natural hazards, and the consequential risk to sustainable development. As a result, CARICOM Heads of Government asked the World Bank to assist in designing and implementing a cost-effective risk transfer programme for member governments.

Launched in 2007 CCRIF is the world's first multi-national risk pool to cover sovereign risk via parametric insurance and serves as a regional catastrophe fund for Caribbean governments. Current policies are designed to limit the financial impact of devastating hurricanes and earthquakes by providing liquidity very quickly after a major event. Functions like business interruption insurance against Government revenue reductions in the aftermath of major natural catastrophes. The risk pool is controlled by the 16 participating governments, with each government paying a premium related to its own risk exposure and being able to buy coverage up to an annual aggregate limit of US\$100 million per peril.

**Governance:**





**Coverage:** CCRIF currently offers parametric policies for hurricane (wind) and earthquake perils and policies have a high per-event deductible (1 in 15-yr loss for hurricane, 1 in 20-yr for quake), and an annual coverage limit. Pricing is calculated as a function of the pure risk (expected annual loss) on each contract and coverage is designed to cover short term revenue shortfall (c.f. Business Interruption), NOT infrastructure, indirect social costs etc

**Finances:** CCRIF issued 29 annual policies to 16 CARICOM countries in 2010 (4th year) and initially raised capital to cover claims and operating costs from donors (c. US\$65 million) and from its participants (c. US\$22 million). CCRIF underwrites ~\$650M of coverage on an annual aggregate basis, with reinsurance above a \$20M retention of \$111M, providing security for a one in one thousand year series of events.

**Value of pooling/Benefits:** Pooling of risk across wide geographical area provides excellent diversification and access to coverage previously unavailable to individual member states. Pooling into single reinsurance transaction improves access to and pricing from global markets and allows innovative structures. In addition, parametric policies allow total objectivity and rapid payouts and Pricing based on technical risk which avoids cross-subsidization.

**Limitations:** High deductible means that it only covers major catastrophe events in which national economies are severely impacted and basis risk means that events can occur which produce significant losses but no payout (and the opposite is possible). The concept of parametric is poorly understood, so clients expect their 'insurance policy' to cover everything

**Modeling platform:** Development of the Second Generation model by Kinetic Analysis Corporation (KAC) in conjunction with CaribRM is a further refinement for CCRIF, and broadens the scope of potential financial instruments which could be made available for risk management and mitigation in both the public and private sectors. This new platform enables the use of either a hazard index or modeled-loss as the basis for parametric contracts and the modular and highly scalable architecture of the platform enables new hazard modules and a variety of exposure database formats (including gridded and point-data exposure) to be simply added. **Ivan wind footprint was modeled.**

**Rainfall model:** In addition to the multi-hazard 2G model, CCRIF and KAC, in partnership with the Caribbean Institute for Meteorology and Hydrology (CIMH), has completed a rainfall model focused primarily on quantifying rainfall at high resolution for extreme events. The rainfall model is of particular interest in the agriculture sector and the model produces six-hourly rainfall estimates at ~1km resolution for the Caribbean Basin based on the Global Forecast System initialization data, run with topographic enhancement. Caribbean Institute of Meteorology and Hydrology (CIMH) runs the model 24/7, and excess rainfall policies, based on indexing of the modeled rainfall, will be available by late-2010.

**Rainfall product development:**

1. Use Mesoscale Climate Models to produce historic rainfall rates from the GFS Initialization data
2. Develop surface flow algorithms to accumulate rainfall within basins
3. Conduct verification of climate-model-produced outputs against observed data
4. Develop exposure data base: location and value of assets that can be affected by flood waters
5. Develop rainfall index algorithm as proxy for flood risk
6. Deploy real-time rainfall monitoring and index calculation model at CIMH

**Gilbert rainfall provided provisional rain total for the Blue Mountain Coffee Region project**

**Technical Assistance Programme:**

**Scholarship and Professional Development Programme** – students across the Caribbean region benefits with scholarships for BSc and MSc programmes, and continued professional development.

**Regional Strategic knowledge building** – partnerships with regional institutions and promotes and supports funding for regional technical projects in natural hazards and risk science.

**Support for local disaster risks Initiatives** – support for NDCs, NGOs and other community – based organisations in local hazard risk management and climate change initiatives.

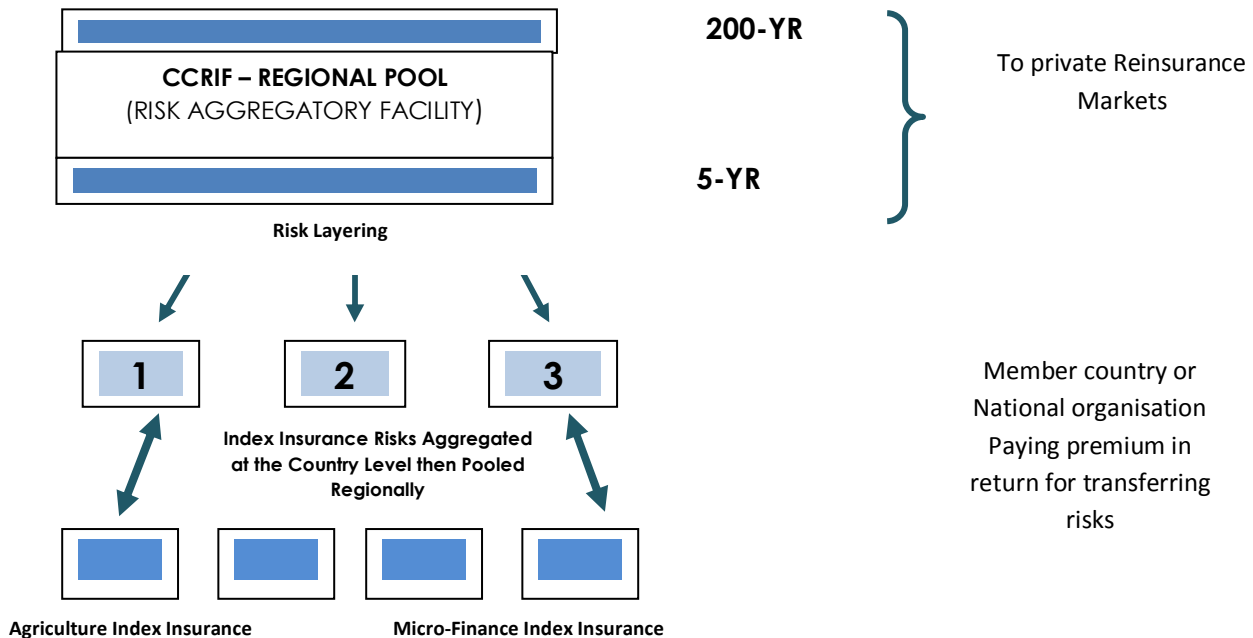
**Climate change (CC)–inducing changes in hazard levels:**

CCRIF has recently supported the first phase of a study of the economics of climate adaptation (ECA) for the Caribbean. Climate change clearly brings variability to hydro-meteorological hazards (generally upward, particularly for catastrophe hazards). First meaningful quantification of the impacts of CC on risk, and ways to cost-effectively adapt (risk reduction and risk transfer) at national and sectoral level.

**Role of CCRIF in Agriculture sector:**

CCRIF can assist in risk modeling through making available the new 2G modeling platform which can be focused specifically for agricultural risk. CCRIF can also provide parametric reinsurance against the portfolio of indexed risk held by the government, growers association or other risk aggregators at the national or sub-national level and can advise in product design, capacity building and education concerning parametric insurance mechanisms. CCRIF CANNOT sell and administer policies to multiple individuals –CCRIF not designed for that purpose.

**CCRIF Role –Schematic**



**Summary :** CCRIF is the world's first parametric risk pool and the first multi-national pool covering sovereign risk and has successfully implemented a low-cost insurance programme for governments which has maximized its attraction to participants, donors and risk transfer markets. CCRIF works because payouts are fast and premiums are low. In addition, the pool is mutually beneficial, transparent and fair.

CCRIF shows the feasibility and benefits of multi-country risk transfer and risk sharing. Already a proactive initiative within the region and can assist in risk modeling with the new HLEM modeling platform which can be focused specifically for agricultural risk and can provide parametric reinsurance against the portfolio of risk held by the government, growers association etc . CCRIF already has strong support from a broad range of stakeholders including donors and technical institutions.

## DEBATE ON OPTIONS FOR REGIONAL AGRICULTURAL RISK FINANCING

MR. MARTIN BUEHLER

GLOBAL INDEX INSURANCE FACILITY (GIIF)

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There is no debate between Simon and Buehler. There is very little dispute in the region – looking at the same challenge from different angles – no silver bullet – but it means using all the ideas from both the public and private sector.

A brief history of how IFC operates was given.

IFC also part of the World Bank Group which works with the private sector works with insurance companies. Projects range from life to crop to medical insurance.

Global Index Insurance Facility (GIIF) supports financing by the use of equities.

In examining the public sector, the social component is important this is considered by the GIFF.

Although, data models are important it is not all about the models but how these work with the buyers.

There is a difference between need and a demand. Insurance can address a demand rather than the need since the demands are measurable. It is not all about data models.

### **Summary:**

IFC –

- Support financing mutual equities
- Public sector has a social component that is important

Difference between need and the demand

Insurance can address a demand rather than needs since it is necessary

Not all about data models

### SESSION 3: FACILITATED PLENARY DISCUSSION

Panel: Dr. Simon Young – CCRIF; Mr. Martin Buehler – CCRIF/GIIF

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#### Questions/Interventions:

**CAFAN:** What if an Event occurs within a year after buying insurance?

**CAFAN:** How to build on this mechanism for the farmers in the association and what would it take for the 16 member countries to get together? There is a need to set up a Risk Fund – since CCRIF already set up then – what can be done to make the system suit us.

**Minister of Agriculture – Dominica:** Any synergies between WINCROP and CCRIF? Is it practical to streamline WINCROP to convert it to an entity to meet risk requirements?

#### Panel Response:

- If events occur more frequently than 1 in 4, the policy holder will still be insured and able to receive on claims.
- Synergies with WINCROP are sure, however, we are working at slightly different levels and there will be constraints. WINCROP will have to be able to pay the claims – but there are potential synergies.
- Queries will be made on the risk analysis not the insurance product.

# PRIVATE SECTOR PERSPECTIVES

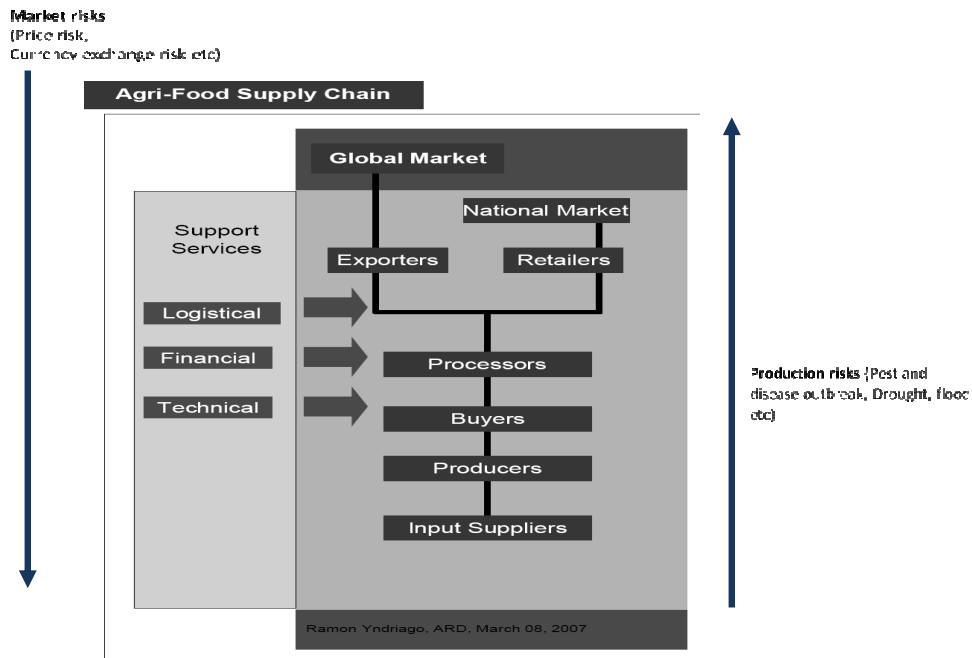
**SESSION 4:**  
***Private Sector Strategies in Managing Risks***

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Chair: Mrs. Florita Kentish  
Food and Agriculture Organisation

**AGRICULTURE SUPPLY CHAIN RISK ASSESSMENT: CASE STUDIES IN THE CARIBBEAN**  
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 DEPARTMENT, THE WORLD BANK

Most Risks are, eventually, transmitted cross the supply chain. The producers are the one's bearing the greatest risks, but they are not alone in an integrated system, which includes traders, retailers, wholesalers, and consumers.



**Supply Chain- Who carries what sort of risks? e.g. Cocoa**

|       | Farmers                    | Aggregators                             | Traders                                | Exporters                                 | Government                    | Manufacturer/<br>Producers       | Retailers                                     |
|-------|----------------------------|---|--|---|-------------------------------|----------------------------------|---|
| RISKS | Crop failure<br>Low prices | Supply chain disruption                 | Supply chain disruption                | Supply chain Disruption                   | Crop failure<br>Low prices    | Local and/or global crop failure | Global crop failure, high prices affect sales |
|       | Supply chain disruption    | Fluctuation in day-to-day price         | Pre-finance risk pisteur/coop          | Pre-finance risk traitant                 | Supply chain disruption       | Long term supply down            | Long term supply down                         |
|       |                            | Contractor credit problem with traitant | Contract, credit problem with exporter | Contract or credit problem with processor | Environmental & social issues | Prices below farmers needs       | Prices below farmers' needs                   |
|       |                            |   | Fluctuation in daily price             |   |                               | Supply chain disruption          | Supply chain disruption                       |
|       |                            |   |  |   |                               | Environmental & social issues    | Environmental & social issues                 |
|       |                            |   |  |   |                               | Quality and food safety          | Quality and food safety                       |



## Risk events are varied

All supply chains are vulnerable to risk events: some more, others less.

- Weather events (drought, floods, etc)
- Natural catastrophe (earthquake, hurricane, tsunami etc)
- Pest and disease outbreak (mad cow disease, avian influenza etc)
- Sudden rise or drop in price (2008 food price crisis, 2000-2003 coffee crisis etc)
- Macroeconomic events (exchange rate volatility, inflation, etc)
- Civil unrest or conflict (2008 Kenya ethnic riot, etc)
- Policy (domestic and international) : (EU food safety legislation etc)
- Transportation blockage ( April 2010 volcanic ash cloud etc)

Some risks are country specific and some risks are regional like climate risks.

## Towards Risk Management Strategies

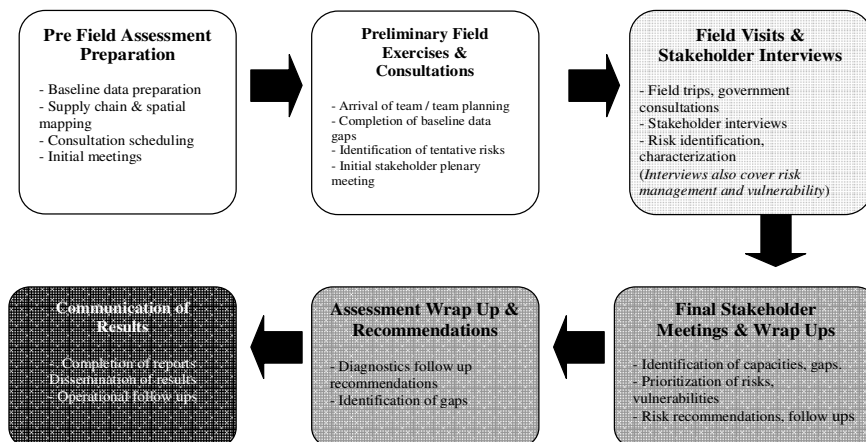
- **Risk Mitigation:** Actions taken to eliminate or reduce events from occurring, or reduce the severity of losses (e.g. water draining infrastructure, crop diversification, extension, etc).
- **Risk Transfer:** Actions that will transfer the risk to a willing third party, at a cost. Financial transfer mechanisms will trigger compensation or reduce the losses in the case of a risk generated loss (e.g., insurance, re-insurance, financial hedging tools, etc.).
- **Risk Coping:** Actions that will help cope with the losses caused by a risk event (e.g. government assistance to farmers, debt re-structuring, etc.).

## Multiple risks

- Some significant for the entire supply chain others relevant only for the producers
- Systemic risk and idiosyncratic risks
- Some risks are insurable, others are not
- One actors risk is another's opportunity (gains)
- Frequent and not-so frequent risks
- Losses from the risk event : low- medium-high

Hence, there is an urgent need to prioritize the risks, particularly, producers so as to effectively use scarce resources.

## Rapid Agricultural Supply Chain Risk Assessment



## Rapid Agricultural Supply Chain Risk Assessment: Lines of Inquiry

- **Risk Exposure:**
  - What risks are all chain participants exposed to or a particular actor?
  - What is the frequency and (potential) severity of these events?
  - How do they impact current income, productivity, etc.?
  - What are expected future financial losses? Simulations...
- **Risk Transmission:**
  - How are ‘shocks’ or adverse events transmitted through the supply chain?
  - What supply chain disruptions/breakdowns occur?
- **Risk Management Approaches:**
  - What are current approaches to reduce, mitigate, share or cope with these risks?
  - How effective are these measures? How sustainable are they?
- **Vulnerability and Impact:**
  - What are the resultant areas of ‘high vulnerability’ to loss, disruption, etc?
  - How are such vulnerabilities impacting investment, the competitiveness of the supply chain, the sustainability of enterprises and relationships, and the achievement of broader public policy objectives?
- **Future Agenda:**
  - What measures can be taken to improve the effectiveness and sustainability of current approaches?
  - What alternative or additional approaches could be used?
  - What are priorities for capacity-building, investment, policy/regulatory reform, etc?
- **Approach:**
  - Consultative process; quantitative data; perceptions/interviews of representative stakeholders; ‘first approximation’ mapping, analysis and ‘action plan’

## Haiti: Coffee Supply Chain Risk Assessment

| Probability of Event |  | Negligible                            | Moderate                             | Considerable                                       | Critical   | Catastrophic  |
|----------------------|--|---------------------------------------|--------------------------------------|--|--|---|
| Highly probable      |  | International coffee price volatility | Transportation blockage              | Failure to regenerate plantation<br>Political Risk | Scolyte  |   |
| Probable             |  | Labor risk                            | Non cyclone excess rain<br>Hurricane |  | Risk of cooperative failure  |   |
| Occasional           |  | Contract failure risk                 |                                      |  | Risk of exporters default of loan  |   |
| Remote               |  |                                       |                                      |  | Fall in domestic consumption<br>Sharp exchange rate appreciation<br>Steep increase in bank interest rate | Decline of cross-border trade to Dominican Republic |

**Grenada: Agricultural Sector assessment - a large number of commodities were considered, not individual supply chains. The biggest risks were cyclones, prices, rodents and pests and disease.**

|                 | Capacity to Manage Risk          |   |  |  |   |
|-----------------|----------------------------------|---|--|--|---|
| Expected losses | 1                                | 2   | 3  | 4  | 5 |
| <b>High</b>     | Hurricane damage in nutmeg       | Hurricane damage in bananas   |  | Losing planting material and germplasm in major storms |   |
| <b>Medium</b>   | Hurricane damage in cocoa        | Extended dry period damaging rainfed crops<br>Fishing boats/assets due to storms                                  | Introduction of contagious animal diseases<br>Entry of pests or diseases through tourist movements and ships               | Entry of new pests or diseases through trade in goods  |   |
| <b>Low</b>      | Hurricane damage in minor spices | Common storm damage to food<br>Common storm damage to export crops<br>Volatility in nutmeg and minor spice prices | Rodent attacks on food and animals<br>Volatility of cocoa prices<br>Volatility in international food/cereals/ dairy prices | Disposal of dead animals following storm               |   |

**Guyana: Rice Supply Chain Risk Assessment - the biggest risks was flooding and then pest and disease. What mattered the most are risks that had the greatest impact and those that were very frequent.**

**Guyana: Rice Supply Chain Risk Assessment**

| Probability of Event |  | Moderate | Considerable  | Critical                         | Catastrophic |
|----------------------|--|----------|---|----------------------------------|--------------|
|                      | <b>Highly probable</b>   |          |   | Delayed payment                  | Flood risk   |
| <b>Probable</b>      | Increase in input prices (fertilizer, chemicals, diesel etc)<br>Price risk<br>Accessibility to dam roads |          | Significant rise in red rice<br>Paddy bug   | Scarcity of water for irrigation |              |
| <b>Occasional</b>    | Increase in transportation cost<br>Excess rain at harvest  |          |   |                                  |              |
| <b>Remote</b>        |  |          | Blast (rice fungus)<br>Regulatory risk ( e.g levy, taxes, legislation etc)<br>Erosion of preferential market access (CARICOM) |                                  |              |

Regarding flooding – what is the cause? - It may have been severe rainfall, poor drainage infrastructure /poor management. Perhaps resources should be put into infrastructure – cost benefit analysis should be carried out to determine where the scarce resources should be used. Right strategies need to be combined. Return investment analysis calculated to determine return on investment.

## Guyana: Rice Supply Chain Risk Assessment

| Identified Risks                             | Proposed Risk Mitigation   | Proposed Risk Transfer Tools         | Proposed Risk Coping   |
|--|--|--------------------------------------|--|
| <b>Flood risk</b>                            |  |                                      |  |
| 1. Due to inadequate drainage infrastructure | Invest in new infrastructure<br>Improve conservancy capacity<br>Upgrade existing infrastructure<br>Repair existing infrastructure<br>Invest in drainage equipments (eg. dredging equipments & pumps)                         |                                      |  |
| 2. Due to excessive rainfall                 | Early warning system<br>Improved metrological infrastructure<br>Invest in weather forecasting and dissemination mechanism<br>Flood hazard mapping<br>Flood resistant rice varieties  | Crop/weather insurance (if feasible) | Better national coordination mechanism for flood management<br>Flood management protocol |
| 3. Due to water-management issues            | Capacity building<br>Performance management<br>Improved user (farmer) involvement in management<br>Improve water-managements systems and processes<br>Improved drainage maintenance strategy<br>Improve water use efficiency |                                      |  |

### Summary

- All the actors in a supply chain are vulnerable to risk events
- Multiple and varied risks
- Shocks, resulting from risk events, erodes competitiveness of supply chain
- and results in sizable losses to many stakeholders in the supply chain
- Identify, Analyze, Prioritize and Manage Risks
- Risk management solutions : Mitigation-Transfer-Coping
- Effective risk management solutions could lead to sustained competitiveness

## WEATHER INDEX INSURANCE FOR AGRICULTURE: LESSONS LEARNT

CARLOS ENRIQUE ARCE

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**The Presentation is based on lessons learnt over 8 years at the World Bank in informing Ministries of Agriculture in planning decisions.**

**Is it possible to design and implement an optimal insurance scheme that can encompass the desirable characteristics?**

- Cost-effective (accessible to the producers)
- Easy to administrate and operate
- Not subject to moral hazard: takes into account incentives and strategic responses from the producers
- Coverage of a wide range of risks
- Fast, efficient and transparent benefit payments
- Financially sustainable (access to international financial markets)

**The World Bank has attempted to find solutions to weather risks using Weather Index Insurance (WII) and the benefits derived from using WII**

- Reduced adverse selection
- Reduced moral hazard
- Field loss assessment is eliminated
- Information requirements for farmers is simplified
- Lower administrative costs
- Facilitation of reinsurance
- Transparency

**The experience: Testing Concepts into Realities:** Index Insurance; concept borrowed from energy sector of the USA and adapted to Agriculture; very complex to apply and still a work in progress.

- Weather index insurance is particularly complex but can be applied at macro and micro levels
- Index insurance must be customized to fit needs of situation
- Technically challenging and complex
- Huge technical and financial support required for implementation

**Research & Development and pilots on Weather Index Insurance (WII)**

- WII mainly developed for drought (some excess rainfall)
- Can be applied at Micro level for individual farmers; Meso level for grower schemes and Macro level (derivatives) for food security issues

**Applied Research:**

- Feasibility for indexed flood insurance (1 country)
- Grid weather data for agricultural insurance (1 Feasibility Study, 3 data grids)
- Credit risk assessment in agricultural finance (5 countries, 15 institutions)

**Development of Training Materials for Weather Risk Management:** Formally transferring capacity in 3 institutions –CIRM, CATIE,

### **The Efforts so far at the World Bank in the application of WII**

**Risk Transfer instrument in Weather Risk Management developed for the following countries** (India, Malawi, Bangladesh, Indonesia, Burkina Faso, Kenya, Ethiopia, Thailand, Honduras, Morocco, Nicaragua, Bolivia, Peru, Guatemala, and Jamaica).

**Clients:** Government, Financial Institutions, Traders, Agribusinesses, Producer Organisations

**Services Offered:** Research, Policy Advice, Technical Assistance, Training and Piloting of Market Based Approaches to Risk Management

### **Lessons Learned from the efforts of the World Bank**

- Weather risks are not ALL risks
- Complex modeling and steep Learning Curve
- Capacity building Vs. Transactions Approach
- Customization Vs. Scalability Challenge
- Reaching Small Farmers at aggregate level Vs. Individual level
- Integration rather Stand Alone Measures
- Need to introduce Mix of: Mitigation – Transfer - Coping

### **Challenging Scenario for applying WII at farmer level in the Caribbean**

- Model is more suitable for droughts but challenging for sudden risks events (i.e. hurricanes)
- No flood models have been designed to date and applicable
- Widespread basis risk
- Heterogeneity and large number small unorganized farmers
- Resolution of Data at farmer level
- Farmers have little access to financial markets
- Large variety of crops. Many short cycle crops complex to model
- Farmers already have risk coping mechanisms: savings, selling assets, borrowing from friends, etc.

### **The Applicability of Weather Index Insurance (WII) in Caribbean Agriculture:**

WII is the most likely risk transfer mechanism to reach small farmers?

However, there is a Need of an AGGREGATOR

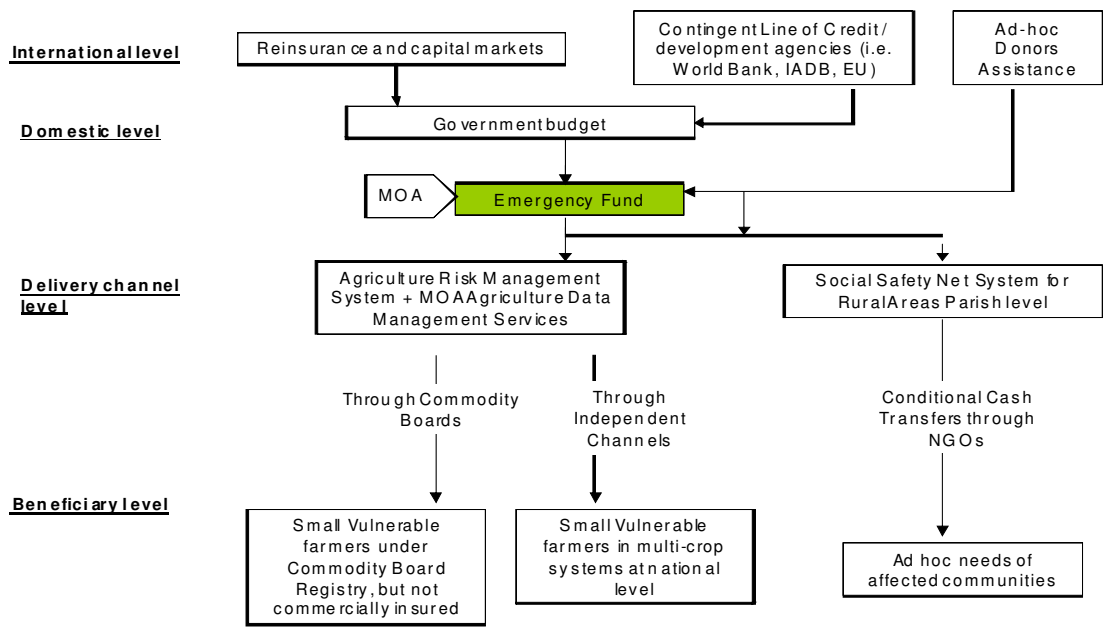
- Aggregate level with Commodity Boards/ Managing portfolio risks for Banks (Meso) = market insurance FOR FARMERS THAT ARE ASSOCIATED – Contingent line of credit – triggered if there is catastrophic event
- Aggregate at Government CATASTROPHIC level / Central gov/ Provincial/ (macro) = social protection FOR INDEPENDENT SMALL FARMERS - Contributions from donors, Government budget, insurance & capital market
- Aggregate level Caribbean Region - Identify and design a trigger emergency fund.

**AGGREGATE WEATHER AGRICULTURAL INDEX INSURANCE AT REGIONAL CATASTROPHIC LEVEL with the Governments as the Policy Holder:**

**CHALLENGES**

- Assessing vulnerability of agricultural assets for so many small countries
- Diversified agriculture
- Frequency and intensity of hurricanes
- Institutional hurdles to pool all agricultural risks into a single vehicle.
- Political Economy of insuring only farmers
- Delivery Channels for compensation

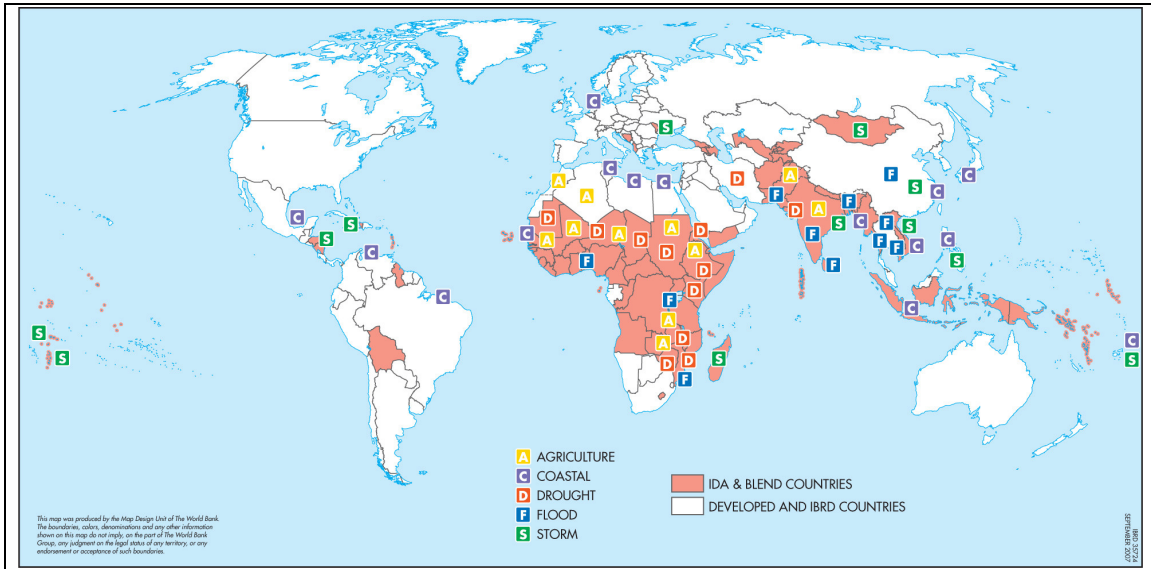
**Catastrophic Insurance for Small Vulnerable Farmers/ Policy Holder: Government**



**Conclusions**

- Weather Index Insurance (WII) is still half way between research and Development and there is still work in progress
- Weather Index Insurance (WII) is more suitable as of today for aggregate applications (i.e. meso and macro)
- Designing any regional CATASTROPHIC FACILITY needs to be custom made and it is complex
- Need of strong technical and financial support for designing a regional CATASTROPHIC cover

Distribution of World Climate Risks Low-income countries are the most vulnerable



## The World Bank promotes a comprehensive disaster risk management framework

**Emergency Preparedness**

- Emergency Response Planning
- Exercises
- Public Awareness
- Communication and Management Information Systems
- Technical Emergency Response Capacity

**Institutional Capacity Building**

- Decentralized Emergency Management System
- Community Participation
- Legislative Framework
- Training, Education and Knowledge Sharing

**Risk Assessment**

**Risk Mitigation Investments**

- Warning and Monitoring Systems
- Hazard Mapping and Land use mapping
- Code Refinement and Enforcement
- Hazard Specific Risk Mitigation

**Catastrophe Risk Financing**

- Financial and fiscal risk assessment
- Promoting property catastrophe risk insurance (including agricultural insurance)
- Sovereign catastrophe risk financing

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financial & private sector development

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## Financial Solutions for Catastrophe Risk Management

| World Bank Group Financial Products & Advisory Services |   |
|---|---|
| Contingent Financing                                    | <ul style="list-style-type: none"> <li>• CAT DDO—a committed credit line for catastrophe risk</li> <li>• Contingent emergency response component in standard investment projects</li> </ul>           |
| Sovereign Catastrophe Insurance Pools                   | <ul style="list-style-type: none"> <li>• Caribbean Catastrophe Risk Insurance Facility (CCRIF)</li> </ul>   |
| Insurance-Linked Securities                             | <ul style="list-style-type: none"> <li>• Catastrophe bonds</li> <li>• Weather hedges (IBRD and IDA)</li> </ul>  |
| Catastrophe Insurance Pools                             | <ul style="list-style-type: none"> <li>• Turkish Catastrophe Insurance Pool</li> <li>• Romania Catastrophe Insurance Pool</li> <li>• South-East Europe Catastrophe Risk Insurance Facility</li> </ul> |
| Index-Based Agricultural Insurance                      | <ul style="list-style-type: none"> <li>• Area-yield crop insurance program</li> <li>• Weather-based crop insurance schemes</li> </ul>   |
| Agricultural Insurance Pools                            | <ul style="list-style-type: none"> <li>• Index-Based livestock insurance pool</li> </ul>  |
| Specialized Index-Based Insurance Facility              | <ul style="list-style-type: none"> <li>• Global Index Insurance Facility</li> </ul>   |

### What World Bank has done In Risk Financing and Mitigation

- » Sovereign Cat Risk Financing
- » Property Catastrophe Insurance
- » Agricultural Insurance

### IFC IS FOCUSING ON INDEX-BASED INSURANCE AS A PLATFORM TO SUPPORT LOCAL CAPACITY BUILDING

#### Traditional Crop Insurance

Farmer insures crop for loss (i.e. if 20% of crop yield is damaged, insurance company pays damages)

- **Problems**
  - Moral Hazard
  - Claims have to be individually checked for actual yield loss
  - High transaction cost – premiums often subsidized
  - Cause of yield loss is difficult to identify
  - Results are poor

#### Index-Based Insurance

- **Reduced moral hazard, exogenous determination**
- **Lower administrative costs**
- **Ability to transfer CAT exposures efficiently into international markets**
- **Versatility: Potential to bundle with other financial services**
- **Flexibility to target diverse level of risk aggregation (dev. organizations, governments, institutions, end-users)**
- **Simplified Risk Assessment: Does not require broad exposure data that is often unavailable.**

## Examples of Indexed Insurance

### Malawi

- Precipitation insurance for Peanut Farmers. Insurance sold with loans for high yield seeds
- If rainfall does not meet historical averages, payment is made, depending on rain amounts and timing
- Banks give loans for high yield seed to farmer only if insurance is bought

### India

- Indexed weather insurance being sold by several providers to farmers, including BASIX
- In 2003: 250 farmers insured
- By 2007: 700,000 farmers expected to have bought policies

### Mongolia

- Indexed livestock insurance
- Proxy used in local livestock mortality rates
- Selling of policies during the spring only
- If the annual mortality rate is above average, insurance policy pays, regardless of number of deaths farmer incurred. If farmer incurs deaths, and the annual rate is below average, no payout is given.

## WHAT IS AN INDEX-BASED INSURANCE CONTRACT?

- **Payment of Losses**
  - Based on values determined by a pre-defined index
  - Payment formula is defined in advance
- **Types of Underlying Indices**
  - Independent, objective and verifiable measure (e.g. rainfall, temperature, wind speed, earthquake intensity)
  - Related to an insurable interest (assets or economic flows)
- **Conceptual Examples**
  - Drought: Less than X cm of rain at a location pays Y
  - Wind: Category X storm within Y km of location pays Z
  - Quake: Richter scale X within Y km of location pays Z

## INDEXED CROP INSURANCE

- Farmer insures crop, based on a proxy that causes yield loss
  - e.g. Rainfall affecting peanut growth, measured at a nearby weather station (WS)
- Insurance pays farmer if expected rainfall does not occur, irrespective of yield loss, as long as index is triggered.
- If there is loss of yield, but there was sufficient rain at the WS, no payment is made.
- Benefits:
  - Eliminates Moral hazard/ fraud associated with Traditional Insurance
  - Low Transaction Cost
  - Fast Settlement Period
  - Payment is not subjective, it is based on a measurable event occurring or not
- Issue: Basis Risk at the level of the individual

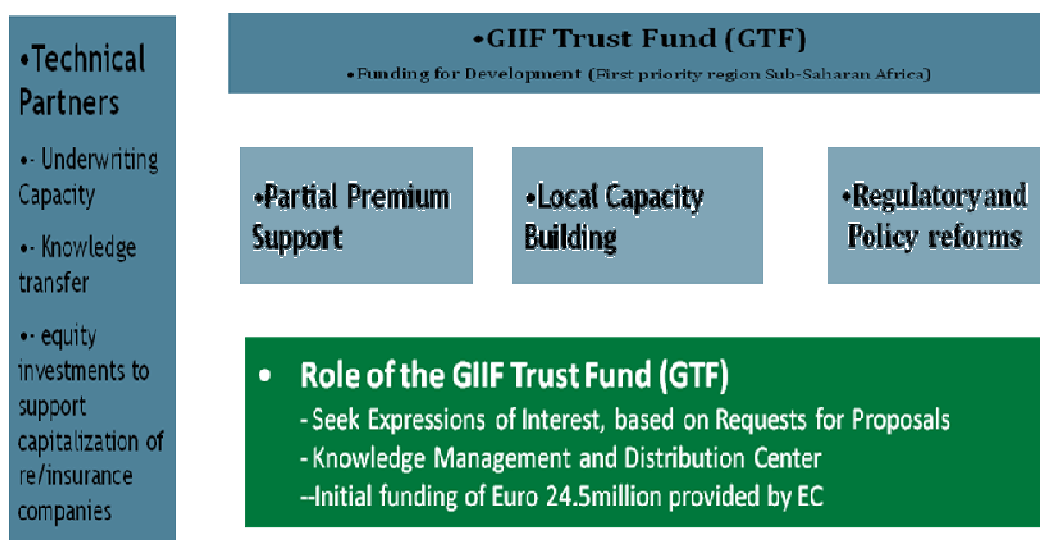
## GLOBAL INDEX INSURANCE FACILITY (GIIF)

### Objectives

- To develop sustainable local markets for index-based insurance to mitigate against weather and natural catastrophe risks in developing countries.
- Improve lending in the Agriculture sector through mitigation of weather risk
- Mobilize local private sector / global players
- Establish knowledge management and distribution platform on Index Insurance

### Facility Structure

- Global Index Insurance Facility (GIIF)



### Premium Support

- Premium support can be provided, subject to stringent conditions and for transitional periods.
- Premium support requires an effective market tender process.
- The insured will make a meaningful contribution to the cost of the premiums.

### Local Capacity Building


- Development of skills and knowledge transfer
- Development of underwriting capacity and delivery mechanisms for indexed/parametric products.
- Support local risk transfer projects.
- up-scaling of existing projects to commercial viable scales
- Awareness raising/ financial literacy.
- Standardization of procedures.
- Regional training seminar.
- Weather data: hardware, acquisition, quality improvement, adaptation of alternative technologies.

**Regulatory Policy and Capacity Building Related Assistance** - The GTF will allocate funds to support policy and regulatory reforms to be carried out with World Bank support. Activities will include the following:

- Developing the regulatory environment for index and parametric insurance products
- Educating public officials
- Training financial sector supervisory staff

- Advising sovereign and sub-sovereign entities in the transfer of catastrophe and weather insurance risks through index and parametric instruments.
- Regulatory capacity building at national and regional level

**GIIF Brochure** <http://www.ifc.org/ifcext/gfm.nsf/Content/Insurance-GIIF>




**International  
Finance Corporation**  
World Bank Group

**DEVELOPING LOCAL FINANCIAL MARKETS**

## Global Index Insurance Facility (GIIF)

**An innovative IFC-led program is expanding access to insurance for natural disasters and weather risks in developing countries.**

Insurance providers in Africa and other developing regions rarely offer the hazard insurance familiar to industrialized countries. Earthquake, flood, and hurricane victims often lose their homes in an instant, recovering none of their investment unless they are fortunate enough to be part of a donor-funded disaster relief program. Likewise, droughts can wipe out the crops that farmers rely on for income.



IFC, together with the International Bank for Reconstruction and Development (IBRD), also a member of the World Bank Group, has established the Global Index Insurance Facility (GIIF) to address this problem. GIIF takes an innovative index-based approach to insurance that aims to expand access to insurance products in developing countries, and particularly to farmers and people in agrarian communities.

With traditional insurance, a farmer insures crops for loss, so if 20 percent of crop yield is damaged, for example, the insurance company pays damages. This system creates moral hazard and requires that claims are individually checked for actual yield loss leading to high transaction costs and the frequent need to subsidize premiums. Results of this type of insurance are often poor for the insured and the insurer, and the complexities involved provide little incentive to expand such insurance provision into emerging or frontier markets where it is needed most.

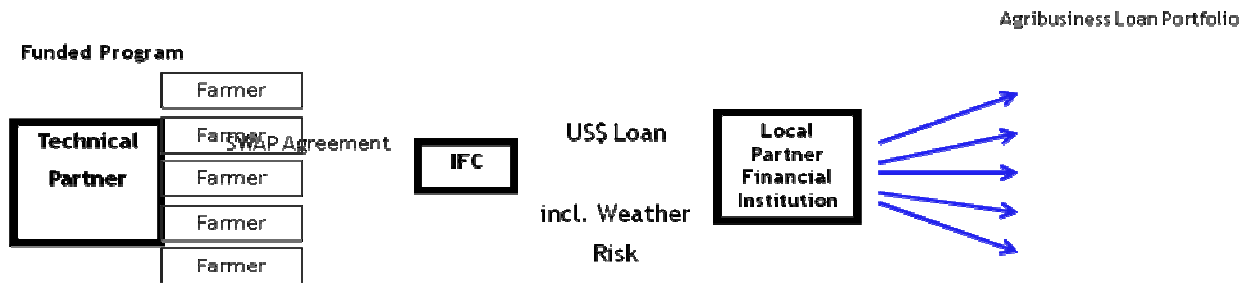
**Current Status of GIIF:**

- Review of Applications received by January 31, 2010, for the 1<sup>st</sup> REOI.
- On May 15<sup>th</sup>, 2010 a second round of project applications will be initiated.
- Ongoing fund raising for Non-ACP countries.

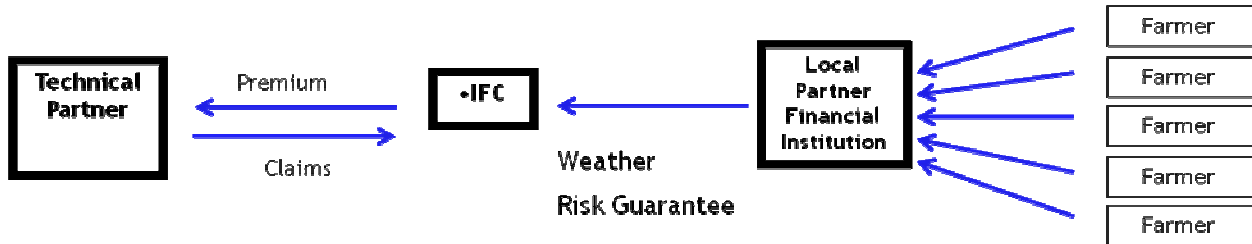
**For more information contact:** Mr. Peter Maina at [PMaina@ifc.org](mailto:PMaina@ifc.org), Telephone: + 27 11 731 3223 or contact Mr. Martin Buehler at [MBuehler@ifc.org](mailto:MBuehler@ifc.org) telephone: 202- 458-7553

**Alternative Delivery Model - Hedging of Weather Linked Loans:** Agribusiness Focus: A fee based, private sector wholesaling option utilizing IFC AAA credit status.

## Funded Programme



## Unfunded Programme



#### SESSION 4: FACILITATED PLENARY DISCUSSION

The contents of a message sent by Honourable Robert M. Persaud, Minister of Agriculture, were read by Mrs. Florita Kentish, Chairman of Session 4. Minister Persaud was not able to attend the symposium due to a pressing engagement.

#### MESSAGE

**HONOURABLE ROBERT M. PERSAUD, M.P., MBA,**  
MINISTER OF AGRICULTURE OF GUYANA

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Ladies and Gentlemen,

It is with great sadness that I have not been able to attend this important Symposium, which comes at a particularly crucial time for the Caribbean Region.

As is well known, agriculture is disproportionately vulnerable to natural disasters caused inter alia by hurricanes, earthquakes and El Nino and La Nina conditions. And with the onset of climate change, we will experience further sea level rises, changing precipitation patterns, ocean acidification, and more extreme weather events in the Caribbean region, which are all likely to negatively affect our agriculture sectors and thus have a significant impact on the Region's Food Security. The Jagdeo Initiative has therefore rightly recognized that we need to do more as a region to coordinate and strengthen our risk management measures.

I would like to take this opportunity to congratulate the Honorary Hilson N. Baptiste, Minister of Agriculture of Antigua and Barbuda and Chairman of TMAC Committee of the Key Binding Constraint related to Disaster Risk Management in Agriculture in the CARICOM Region for the strong leadership he has taken in moving the Region's efforts forward in this area. I hope that under his auspices and with the assistance of the CARICOM Secretariat, the World Bank, the CDB, IICA, the FAO, CDEMA, the EU, CARDI and many other institutions and experts in Disaster Risk Management, this Symposium will lead to concrete and tangible outcomes with regards to rendering the Region's agricultural sector more resilient to natural disasters in particular.

I would also like to take this opportunity to say a little bit of where we are doing in Guyana in terms of defining and implementing an overarching Risk Management Strategy. As you may know, agriculture is the most important economic sector in Guyana, it accounts for approximately 50% of employment, 30% of GDP and 40% of export earnings. Most agricultural production is concentrated along the coastal belt, a narrow strip of land between 5 and 7 kilometers wide, which is up to 1.5 meters below sea level and bisected by several major rivers which drain into the Atlantic Ocean. The coastal plain is protected by a sea-wall and an intricate drainage and irrigation system. Traditionally, sugar and rice have been the most important crops occupying the bulk of Guyana's 400,000 acres of agricultural land on the coast and contributing around 75% of agricultural GDP; however, so-called "non-traditional" agricultural products such as fruits and vegetables, livestock and aquaculture are gaining prominence in recent years.

There is a large potential for agricultural expansion, given Guyana's comparative advantage with regards to its natural resources which remain largely unexploited. A significant portion of Guyana's land mass is arable and fertile. Furthermore, the country has abundant sources of fresh water and an equatorial climate which allows year long growing conditions. Guyana's extended coastline has imbued it with a rich and exclusive fishery zone, and whilst the country enjoys the climatic benefits of the South American coast and the Caribbean, it is situated outside the hurricane zone. The country has a long history of applied agronomy and agricultural production resulting in a skilled agricultural workforce. These factors have led to Guyana being a net food exporter within CARICOM, with significant excess capacity to substantially increase its food exports to other markets.

Despite these favorable conditions, exogenous shocks, particularly extreme weather events and rising sea levels are now posing the biggest challenge to the sector, and have already caused millions of dollars of economic losses. Between the periods 1988 to 2006, seven natural disasters have hit the sector, of which two correspond to

drought and four to flooding. The total economic damage caused due to these natural hazards was estimated to be on average over US\$34,900,000 per year<sup>1</sup>.

These events can put a tremendous amount of pressure on Guyana's productive capacity, its economic stability, its budgetary planning systems and compromise food security both regionally and nationally. Furthermore, they have the frightening power to reverse any gains on poverty reduction which is predominantly concentrated in Guyana's rural areas, where agriculture is the main source of income.

According to recent climate change forecasts, significant impacts of sea level rise driven by an increase in global temperatures are expected to occur in the low-lying coastal areas of Guyana. Precipitation in Guyana is likely to be lower, thus reducing water availability during the dry season, but with evaporation levels expected to increase by about 5% by the 2040's, the daily intensity of rainfall may well increase, thus leading to a higher occurrence of droughts as well as floods in the future.<sup>2</sup>

The Government of Guyana, in partnership with the private sector, NGOs and the international donor community, has taken an overarching and concerted approach to managing the risks in the agriculture sector. The three-pronged approach is largely aimed at:

- (1) **Mitigating Risks** through agricultural diversification, investments in infrastructure and in innovative technologies;
- (2) **Minimizing Damages** through improvements in early warning systems, public awareness campaigns and public sector assistance for the most vulnerable; and
- (3) **Exploring Risk Transfer Options**, such as agricultural insurance, which are feasible in the Guyana context.

It is hoped that this approach will assist the sector in achieving its true potential that is, being a competitive, dynamic, sustainable and resilient sector, capable of supporting its people and the world more widely in their right to food security.

However, Guyana still has a long way to go before it can safely say that it has been able to shield its agricultural sector from the risks it faces. Despite the massive amounts of financing that have already been spent and committed to the sector, significantly more investment will need to be pumped into all of the areas outlined above and a number of additional initiatives will need to be taken, which such as in the case of agricultural insurance, are not always as straightforward as they may seem at first glance.

As I am sure many of you will agree, there are no quick fixes in agriculture and any increase in resilience in the agricultural sector requires a massive amount of efforts by all the stakeholders involved. That is why this Symposium is a milestone as it brings all the stakeholders together to think constructively about ways of measuring and tackling the issue at hand.

The focus, however, must always remain on implementation. I would therefore like to urge all partners to stay actively engaged in the region's drive to improve its disaster risk management capacity, for the region's food security cannot be the subject of natural calamities. I wish you well in your deliberations and am looking forward to reading the report coming out of the Symposium.

With Best Regards,

**Robert. M. Persaud, M.P., MBA,**  
**Minister of Agriculture**

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<sup>1</sup> World Bank analysis, based on data from the OFDA/CRED International Disaster Database.

<sup>2</sup> World Bank Guyana Agricultural Insurance Pre-Feasibility Draft Report

## Responses:

**Minister of Agriculture, Dominica:** The letter from Guyana’s Minister of Agriculture dovetails what he had to say. The three main objectives of the symposium are the key reasons why he is present. Dominica is vulnerable to the risks and the Government is responsible to find funding to help. He needs advice towards the feasibility of the insurance scheme. There is a need to get the experts to indicate the way forward. Is Agric insurance feasible for the Caribbean or if not what?

**CAFAN:** Also a genuine partnership between the public and private sector is essential, where farmers do not have to bear the risks alone. CAFAN has been able to share information and work with the countries in the region, and have categorized farmers as commercial, semi- commercial and subsistence farmers. Also, take into account the different mitigation measures already in place with the commercial farmers who are at a level of insurable risk. Even the subsistence farmers have been growing hurricane crops as part of the mitigating measures. The farmer image is being worked on; farmers are now, well educated business people. WINCROP is a successful model.

**National Development Foundation:** Risk among this supply chain greatly affects the micro financial institutions. The institutions that take the greatest risk are the micro financier’s institutions (MFI). Banks do not give loans to farmers, in many cases MFI’s have to write off loans in the face of disasters. There is the need for micro financial Institutions to be incorporated in the payout of insurance claims.

**WINFA (Windward Islands Farmer Association):** By the end of the symposium, a resolution (implementation policy) should be ready to go to the Heads of Government meeting. He agrees that Insurance be considered as a part of the solution for farmers. Bananas are highly vulnerable, is it possible to get advice from CARDI to determine what crops are not vulnerable to cyclones?

**CARICOM:** We need to come out with a strategy for the farmers with assistance from IICA, CARICOM and Ministers of Agriculture, to go to the Heads of Government meeting. What is the cost of financing insuring the farmers? Financing has to be along the value chain analysis – how do you overcome risks to become more lucrative? The interest rates are high.

**CARDI:** CARDI needs to be part of the document writing that comes out of this symposium; even though CARDI will not be present on Friday. Agrees with Grenada, the crops need to be identified. Work is in progress – piloting of agriculture structure, this will assist in the mitigation structure. Prioritizing crops ...root crops seem to be exposed to less risk. Improving Agricultural structures is important (easy to dismantle and rebuild). Seed storage and use of disease resistant varieties is occurring. All considered but food security is important.

**Oxfam (Jamaica):** What are some of the constraints?

## Panel Response:

Carlos: Presented lessons learned may have a pessimistic approach not to scare but to make one aware of what it takes. He is optimistic that’s why there is the World Bank presence. The responsibility is that what is taken to the ministers is practical and feasible. Any position taken the World Bank will be happy to work with. It is better transfer from a system of post ad hoc manner to an ex-ante system.

The area of agricultural insurance is complex. Lesson learned from the World Bank, best advisory, main message not to scare you away but be aware of what is feasible and what it takes, if you ask me – I am optimistic – that is



why we are here, to take the funding from the EU – we know the region needs assistance and can provide opportunity to assist.

The micro financier can take out insurance in itself. If the government is the policy holder, they can authorize the micro financiers to get initial pay out.

Regarding OXFAM, basic constraint not to be product driven, without value proposition of that product within the risk management of that, not feasible. Other constraints: data access, historic, financial, weather  
Lessons learnt- will be publishing on how to implement Index Insurance.

CARDI is the best to advise most suitable crop. Mitigation very important and happy it will be presented at COTED.

**SESSION 5:**  
***Producers Experiences in Agricultural Insurance:***

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Chair: Mr. Jose Alpuche  
Belize Agro Productive Sector

## WINDWARD ISLANDS CROP INSURANCE (1988) LTD. (WINCROP)

MRS. HERNICA FERREIRA

WINCROP

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### WINCROP CORPORATE INFORMATION

#### Established in:-

- Dominica - 1987
- St. Vincent - 1996
- Grenada - 2000

Incorporated in Dominica in 1988 as a Company limited by shares with a Head Office in Dominica and Branch offices in St. Lucia and St. Vincent

#### MAIN OBJECTIVES OF WINCROP

- To carry out the business of Crop Insurance
- To secure re-insurance against any and all risks assumed
- Provides statutory insurance and optional contractual insurance against loss of banana holdings by windstorm and volcanic eruption.

#### PRECURSOR TO WINCROP

- Transitory programmes
  - 1959 – 1969: loss compensation - all islands
  - 1969 – 1971: Dominica excluded
  - 1972 – 1979: Dominica (David)
  - 1974 – 1982: St. Vincent (Emily)
  - 1974 – 1980: St. Lucia (Allen)
- These schemes ultimately failed.
- Unsuccessful Disaster Funds
  - 1970 – 1987: Every Island
  - 1983 – 1989: St. Vincent
  - 1983 – 1987: St. Lucia
  - 1987 – 1992: St. Lucia (10% scheme alongside WINCROP)

#### REASONS FOR FAILURES

Lack of separation of insurance funds; Abuse of the system; Low cess, low provision for benefits; Difficulties in obtaining re-insurance; and Lack of insurance experience

#### STRUCTURE OF WINCROP

- The shareholders are:-
  - Dominica Banana Marketing Corporation (DBMC)
  - St. Lucia Banana Corporation (SLBC)
  - St. Vincent Banana Growers' Association (SVBGA)
  - Grenada Banana Cooperative Society (GBCS). WINCROP office closed in Grenada when banana export ceased. Currently, DBMC and SLBC don't operate and the shares are held by the respective governments.

Designed as a small farmer organisation which allowed WINCROP to be successful and all the Seed Capital was provided by local grower associations.

## FUNDING OF WINCROP

Funding among the Banana Grower Associations (BGAs) was as follows:-

|       | EC\$      | %     |
|-------|-----------|-------|
| DBMC  | 887,000   | 26.06 |
| SLBC  | 1,481,000 | 43.50 |
| SVBGA | 901,000   | 26.47 |
| GBCS  | 135,000   | 3.97  |
| Total | 3,404,000 | 100.0 |

Contributions made by the shareholders were based on 1987 production levels

## PREMIUM AND BENEFITS

- Premium - 2.5 EC cents per pound in St. Lucia and Dominica
- 1.1EC cents per pound - St. Vincent and Grenada
- Benefit rate - 10.0 EC cents per pound all islands
- Deductible - First 20% for each and every loss
- Constructive Total Loss - 80% assessed damage

## WINCROP'S EXPERIENCES – based on loss assessments as opposed to Weather Insurance Index (WII)

- Two years after operations started, Hurricane Hugo struck the islands in 1989;
  - 9,937 Claims received
  - 8,882 Claims approved for payment
  - EC\$8.8 million paid in benefits to growers
    - Dominica - EC\$7.9 M or 89%
    - St. Lucia - EC\$0.97M or 11%

**RESULTS OF THE HURRICANE HUGO TEST:** The handling of a large number of Hugo claims resulted in favorable publicity. How such a large event was handled by such a young WINCROP? WINCROP utilized On-Call Assessors (OCAs) to carry out assessments

- 80 OCAs in Dominica and 34 OCAs in St. Lucia

**TROPICAL STORM DEBBIE 1994** - Extensive damage to banana crop and Claims distributed as follows:-

| Island    | Claims Processed | Claims Paid | EC\$ (M) |
|-----------|------------------|-------------|----------|
| St. Lucia | 6386             | 5802        | 7.8      |
| Dominica  | 2397             | 2189        | 1.6      |
| Total     | 8783             | 8091        | 9.4      |

**VARIOUS STORMS – 1995**

- Eleven storm events recorded
- 17,144 claims received
- 14,905 claims approved for payment
- \$15.5 million paid in benefits
- 4 major events were a tropical wave of 7<sup>th</sup> July; one tropical storm followed by two hurricanes within a period of 19 days.

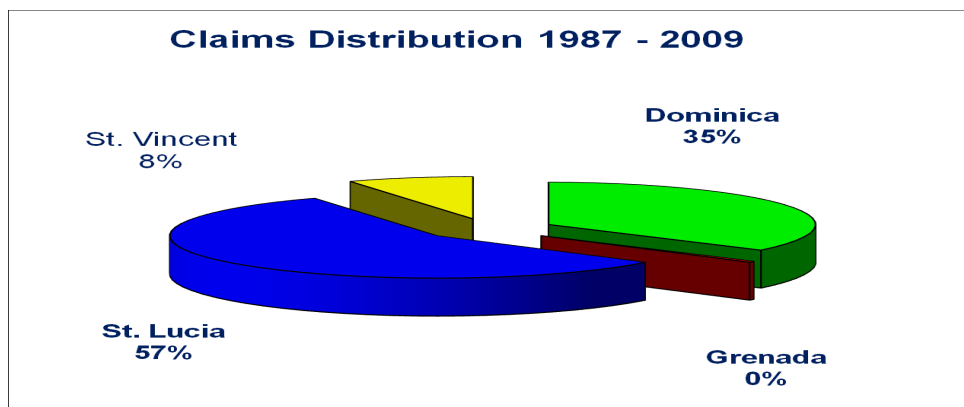
**1995 CLAIMS**

| Event               | Dates - 1995 | Event Type                  | Loss Cost (\$)    |
|---------------------|--------------|-----------------------------|-------------------|
| 1 - 5               | March - July | Wind blows & Tropical Waves | 411,723           |
| 6                   | 20.07.95     | Tropical Wave               | 3,054,838         |
| 7                   | 27.08.95     | T.S Iris                    | 5,939,008         |
| 8                   | 04.09.95     | Hurricane Luis              | 4,447,927         |
| 9                   | 14.09.95     | Hurricane Marilyn           | 1,656,483         |
| 10 - 11             | Sept – Oct   | Wind blows                  | 7,388             |
| <b>Total Claims</b> |              |                             | <b>15,517,366</b> |

**CLAIMS MANAGEMENT**

- Tropical Storm Debbie in 1994 remains the single biggest event in WINCROP’S history with claims of \$9.42M.
- WINCROP’s best claims experience was in 1995
- 1995 produced highest annual aggregate of claims experienced by WINCROP.
- Loss Assessment was a massive exercise requiring the deployment of 204 OCAs on three islands.
- Since 1994 and 1995, WINCROP have paid other large storms

**CLAIMS PROCESSED 1987- 2009**



## CLAIMS DISTRIBUTION 1987-2009

| Islands      | # Claims Received | # Claims Paid | Amount Paid EC\$  | % of Claims |
|--------------|-------------------|---------------|-------------------|-------------|
| Dominica     | 31,928            | 27,983        | 27,241,697        | 35.4%       |
| St. Lucia    | 79,720            | 63,112        | 43,491,977        | 56.6%       |
| St. Vincent  | 8,538             | 6,858         | 5,817,272         | 7.6%        |
| Grenada      | 581               | 479           | 346,399           | 0.4%        |
| <b>TOTAL</b> | <b>120,767</b>    | <b>98,432</b> | <b>76,897,345</b> | <b>100%</b> |

### REINSURANCE

- Costly but essential provision
- Provides capacity to pay claims in excess of reserves in the event of a major disaster
- Stabilizes effect of losses on company's funds
- Spreads risk on an international portfolio
- Programme would be a mere disaster fund without re-insurance

### REINSURANCE ACCOUNT

| 1987 – 2009                       |                |
|-----------------------------------|----------------|
| Premium Paid to Re-insurers       | \$38.0 million |
| % of Gross Premium                | 34.6 %         |
| Claims paid by Re-insurers        | \$20.3 million |
| % of total claims paid to growers | 26.3 %         |

### ON-CALL ASSESSORS (OCAs)

- With minimal office staff, WINCROP engages some 200 plus OCAs.
- In accordance with established procedures, pre-season loss assessment training courses have been conducted to ensure that all OCAs adhere to standardized damage count procedures for estimating % windstorm damage.
- Annual training is conducted by permanent Assessors and Adjusters.
- OCAs work in pairs and assessments are audited by permanent assessors
- OCAs can be terminated at anytime for a number of reasons

**LOSS ASSESSMENT** - based on estimation of percentage damage to insured bananas in each holding using one of 3 methods.

1. Purposive random sampling where damage levels are less than 80%
2. Modified full plant count when damage levels are 80% or greater and for small holdings
3. Area assessments for extensive damages
4. Provisions are made for the process of arbitration if grower does not accept assessment.

## DIFFICULTIES OF OPERATIONS

- WINCROP has succeeded in its mandate to growers but there have been difficulties with decreasing grower populations resulting in significantly less premium income for WINCROP

| Year | # Active Growers | Premium Income (\$) |
|------|------------------|---------------------|
| 1988 | 13,700           | 5,924,882           |
| 1990 | 27,776           | 9,318,938           |
| 1992 | 30,578           | 11,044,022          |
| 1995 | 20,186           | 6,571,230           |
| 2000 | 11,062           | 6,491,959           |
| 2005 | 2,613            | 1,495,241           |
| 2008 | 2,380            | 1,070,300           |
| 2009 | 2,929            | 1,177,000           |

- For 9 consecutive years (2001-2009) WINCROP incurred losses on operations due to low premium income in a declining industry. Reasons for decline:
  - Removal of preferential access to EU markets and international commodity price fluctuations and price wars.
  - Lack of Government subsidy for growers' premiums.
  - The fact that growers themselves have to pay the full premium is a disincentive. An increasing number of growers prefer to sell their bananas on the regional markets where there are less quality concerns
  - Declining export levels, due to decreasing prices on U.K. markets
  - 60% of growers not insured in St. Lucia due to absence of legislation
  - All available literature suggests that full farmer participation is absolutely necessary for small farmer crop insurance programmes to succeed
  - Hence Government's role in ensuring that legislation is in place
  - High administrative cost

## WAY FORWARD FOR WINCROP

- Must diversify into other crops and Agri-businesses regionally.
- Need for funding to accommodate diversification thrust.
- Need for Government subsidies for premium and grower benefits.
- Need to reduce administrative cost

## POTENTIAL PRODUCTS FOR INSURANCE COVERAGE

- Aquaculture
- Farmhouses and Equipment
- Green Houses
- Plantains

- Tree Crops (avocado, cocoa, nutmegs, others)
- Livestock (poultry, pigs, cattle)
- Others
- WINCROP needs the intervention of agencies willing to support agriculture.
- Legislation to ensure full farmer participation
- As the only Regional organisation with experience and capability in Crop Insurance, WINCROP needs full support of the Governments and Agricultural Businesses.



## SMALL HOLDERS AGRICULTURE INSURANCE IN THE CARIBBEAN: THE CASE OF FARMERS IN ST. ELIZABETH AND PORTLAND PARISHES IN JAMAICA

MR. PABLO VALDIVIA  
CONSULTANT, WORLD BANK

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### Farmers Characteristics: Very Small plots of land for a wide (huge) variety of crops

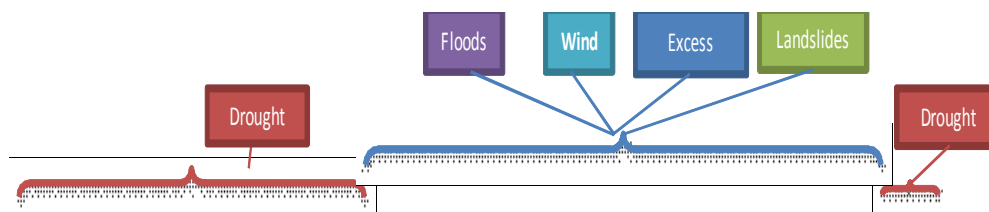
- **The majority of land holdings in St. Elizabeth and Portland are small (<2 Ha).**
  - Portland: 61.28%
  - St. Elizabeth: 88.91%
- **Multi-cropping systems function as a *Risk Management Strategy*.**
  - Main Crops:
    - Portland: Plantain/banana, coco, coconut, coffee.
    - St. Elizabeth: yam, banana, cassava, tomato, peanuts, sweet potato.
  - Permanent crops vs cereal crops

**Livestock breeding is as important as crops production and can be used to support the crop farmers.**

### Jamaica Faces a Variety of Natural Hazards

- **Jamaica weather conditions vary both spatially and temporally.**
  - Average rainfall is 1,981mm.
  - Heaviest rainfall: 5,080 mm (Blue Mountain).
  - Driest area: 762 mm (Kingston)
  - Maximum rainfall: May and October.
  - Driest months: February and March.
- **There are 3 weather hazards that cause the greatest economical impact in the Agricultural sector in Jamaica:**
  - Short-duration extreme rain.
  - Longer term substantial deviations from average rainfall (Excess of rain, drought).
  - Short-duration extreme winds.

**Multiple risks impact crops production. Crops exposure to weather risks varies across the year**



| 2008         | Jan         | Feb | Mar | Apr         | May | Jun | Jul         | Aug | Sep | Oct         | Nov | Dec | Annual  |           |
|--------------|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|-------------|-----|-----|---------|-----------|
|              | 1st Quarter |     |     | 2nd Quarter |     |     | 3rd Quarter |     |     | 4th Quarter |     |     | %       | Ha        |
| Vegetables   | 31.43%      |     |     | 35.43%      |     |     | 30.37%      |     |     | 26.59%      |     |     | 30.94%  | 9,528.00  |
| Yams         | 22.51%      |     |     | 16.24%      |     |     | 20.39%      |     |     | 27.25%      |     |     | 21.66%  | 6,672.00  |
| Legumes      | 15.03%      |     |     | 7.71%       |     |     | 9.81%       |     |     | 11.21%      |     |     | 11.11%  | 3,422.00  |
| Condiments   | 7.49%       |     |     | 9.18%       |     |     | 7.83%       |     |     | 7.19%       |     |     | 7.90%   | 2,432.00  |
| Fruits       | 5.66%       |     |     | 10.53%      |     |     | 9.44%       |     |     | 4.49%       |     |     | 7.45%   | 2,293.00  |
| Potatoes     | 5.06%       |     |     | 6.82%       |     |     | 6.03%       |     |     | 6.05%       |     |     | 5.95%   | 1,832.00  |
| Other Tubers | 5.20%       |     |     | 5.77%       |     |     | 5.58%       |     |     | 6.47%       |     |     | 5.73%   | 1,765.00  |
| Cereals      | 4.22%       |     |     | 4.96%       |     |     | 5.31%       |     |     | 5.27%       |     |     | 4.92%   | 1,513.80  |
| Plantains    | 1.43%       |     |     | 2.88%       |     |     | 4.75%       |     |     | 2.49%       |     |     | 2.84%   | 875.00    |
| Sorrel       | 1.98%       |     |     | 0.47%       |     |     | 0.50%       |     |     | 3.00%       |     |     | 1.51%   | 465.00    |
|              | 100.00%     |     |     | 100.00%     |     |     | 100.00%     |     |     | 100.00%     |     |     | 100.00% | 30,797.80 |

Crops susceptibility to weather risks and to pest and diseases vary between crops and even within the same crop.

**What risks are insurable? Currently, which are the major challenges?**

- **There are risks that are very challenging to insure and/or are not insurable:**
  - Flood risks
  - Landslides
  - Wind speed.
- Huge number of farmers + very small holdings for agricultural production.
- Potential insured areas are dispersed.
- High Administrative costs to operate insurance.
- Multi-cropping systems.
- Planting dates not clearly defined.
- Limited financial capability to purchase insurance contracts.
- *Limited access to credit (?)*
- Basis risks.
- Limited access to data (loss data / weather data)
- ***Crop insurance could be a low priority for farmers.***

In Jamaica there is **No identifiable distribution channel for small farmer insurance.**

- **Limited information (i.e. production, losses, farmers, ex-post disaster assistance to farmers).**
  - Would it be feasible to work with every single farmer?
  - Who are the leaders within the farmers that could transmit / coordinate / transfer messages to others?
- **Do not belong to commodity boards**
- **Do not borrow from financial institutions or there are very limited bank branches in rural areas.**
- **Little if any association, except for RADA Producer groups.**

**Small farmers have various ways to cope with agricultural risks**

- **Systemic events on agriculture production are retained by the agriculture sector and the Government.**
  - From 2004-2008, J\$13 billion of direct damages to the agriculture sector (estimated).
- **Coping Strategies:**
  - Own savings.
  - Borrowing from
    - Neighbors.
    - Informal networks.
  - Selling assets (livestock).
  - Replanting (short crop cycle varieties).
  - Diversification (new crops).

**What value proposition represents agricultural insurance then?**

- **In this scenario, the recommendation is to strengthen the non-transfer risk management tools**
  1. **Prevention**
  2. **Coping**

**Prevention: Is there any chance to provide protection to stakeholders against disasters, to prevent the occurrence of a disaster or to reduce its intensity?**

- **Identifying risk-prone areas.**
  - Risks mapping.
  - Vulnerability maps.
- **Promoting the adequate use of lands.**
- **Strengthening institutions / Transferring capacities to staff on risk management issues.**
  - Share information
- **Adopting better practices**
  - Planting & Following sowing calendars (s. window)
  - Providing certified seeds to farmers.
  - Building, improving, maintaining drainage, and irrigation infrastructures.
  - Mulching for humidity retention.
  - Sowing new crops (resistant to drought, excess of humidity...)

### **Coping: How a coping mechanism should be?**

The coping mechanisms administered by the Government for CAT events should have:

A risk financing in place

Delivery channel needs to be:  
Efficient, transparent and clear

### **CONCLUSIONS: SMALL FARMERS' RISKS TRANSFER IS VERY CHALLENGING.**

- Agricultural insurance does not fit all; it is not the panacea
- There are some risks that are not insurable.
  - It makes more sense when the Government strengthens its institutions, and cooperates with the private sector to cope with risks that affect agriculture production.
    - Implement and develop a sustainable programme / mechanism.
  - Agricultural production in vulnerable areas has to be considered as part of an overall risk management plan.
- Basis risks at Meso-level & Macro-level contracts could be less of a concern than individual contracts.
  - Transaction costs could be lower
  - Speed the process that is involved in assisting farmers (macro).
- Distribution channels are needed to reduce costs related with insurance marketing, operation, and promotion.

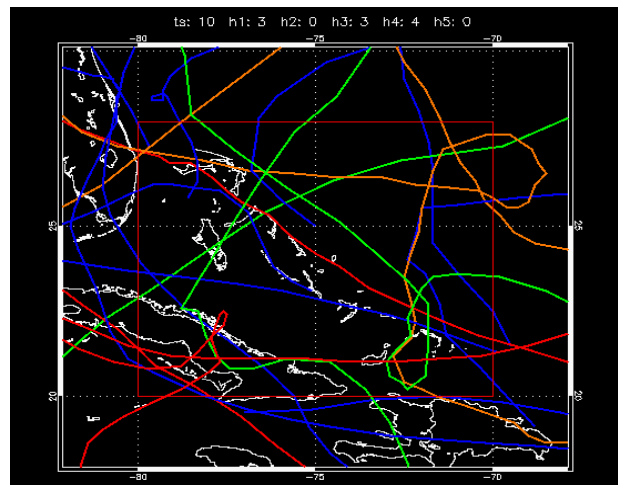
# HURRICANE INDEX (COUPON) INSURANCE FOR SMALL FARMERS, LIVESTOCK PRODUCERS AND FISHERMEN IN THE BAHAMAS: AN FAO PRE-FEASIBILITY STUDY

DR. LYSTRA FLETCHER-PAUL  
FOOD AND AGRICULTURE ORGANISATION (FAO)

## Background to the Study

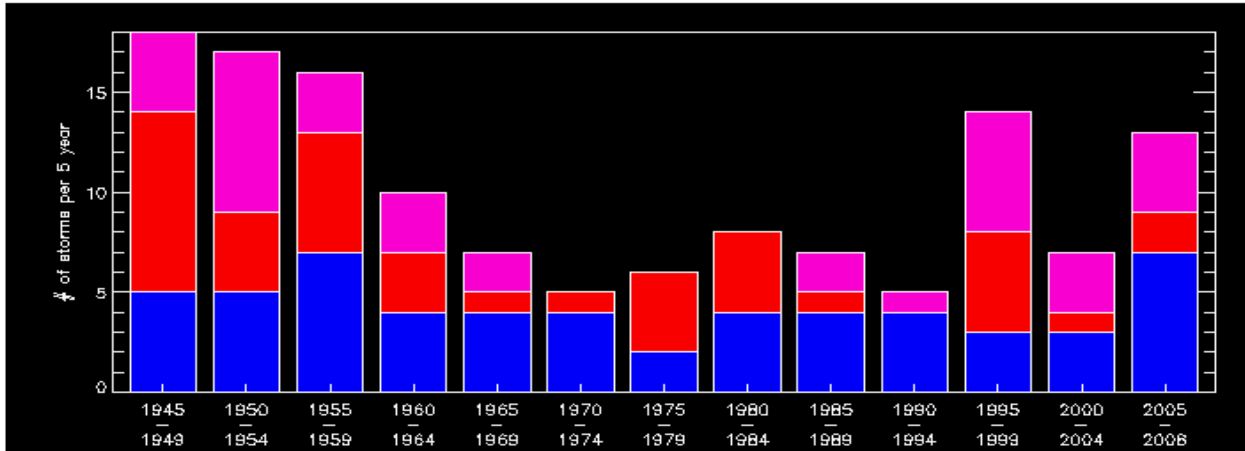
- Request from The Ministry of Agriculture & Marine Resources, MAMR, of the Government of the Commonwealth of the Bahamas to FAO's Technical Cooperation Programme (TCP) to provide technical assistance to identify suitable catastrophe hurricane risk transfer/insurance solutions for mainly individual small farmers (crop and livestock producers) and fishermen. The request was presented in view of the very restricted compensation which Ministry of Agricultural & Marine Resources is able to provide under its disaster relief scheme. In previous years, the disaster relief allocation for crops and livestock was about B\$ 400,000, in 2008 this was reduced to B\$ 200,000 and in the 2009 financial year this was only B\$ 100,000. The disaster compensation system is not capable of assisting more than a fraction of farmers following a loss. It is considered highly expensive and time consuming to administer as DOA staff has to visit the damaged farms after each hurricane or flood event to assess the damage. Delays in processing and settling claims often ran to 6 months or more and farmers did not like to receive compensation in kind (mainly seeds and fertilizers).
- Current status: Draft TCP project, for the design, rating and implementation of a Hurricane Index Insurance Scheme formulated and alternative risk management options identified.

## The Bahamas Islands are extremely exposed to Tropical Storm and Hurricanes



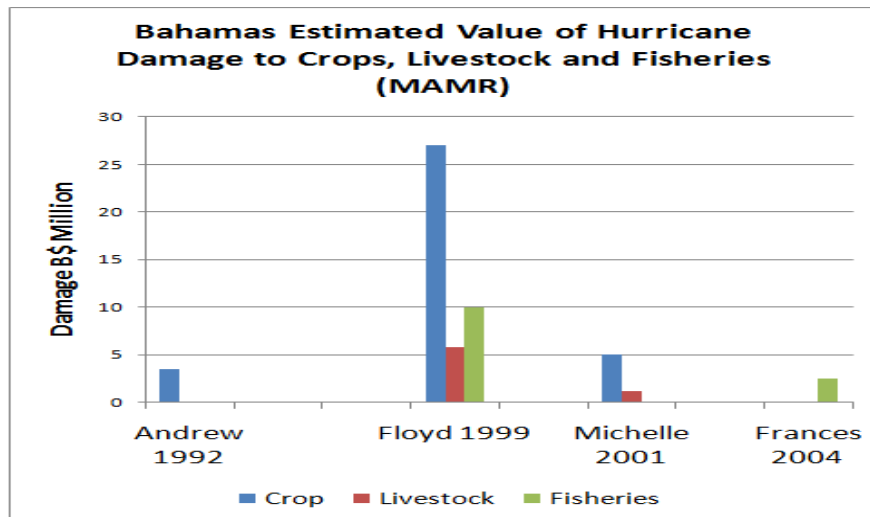
**The Bahamas Islands are extremely exposed to Tropical Storm and Hurricanes**

5-Year Frequency of Tropical Storms and Hurricanes 1944-2008



Blue – Tropical Storm  
 Red – Hurricane 1&2  
 Purple - Hurricane 3-5

**Damage is high in Crops, Livestock & Fisheries**



**Availability of Hurricane Insurance Protection in the Caribbean is very restricted**

- Windward Islands: WINCROP: Individual grower traditional damage-based Windstorm & Earthquake insurance policy for export bananas
- Jamaica: Large private banana estate hurricane index insurance. Former damage-based industry schemes for individual banana and coffee growers are no longer operative
- Martinique / Guadeloupe: French Govt. disaster relief payments to individual farmers

- Bahamas: No crop or livestock insurance. Fishermen can insure their boats (marine hull policy) but not their fishing gear (e.g. Lobster pots)
- Caribbean Catastrophe Risk Insurance Facility (CCRIF): hurricane & earthquake index insurance product which indemnifies Island Government's against catastrophe losses to infrastructure (but not agriculture per se)

### Target Audience

- **Crop & Livestock Producers**
  - 2,000 farmers on 15 main Islands
  - 10,000 Ac (4,050 Ha) cultivated area
  - Main crops: fruit (citrus, mango), banana, horticulture & vegetables
  - High value ornamental plant / greenhouse production on New Providence Island
  - Mainly poultry and pig producers, some cattle and sheep and goats
  - Average farm size 5 acres; a few large citrus producers (> 500 ac)
- **Fishermen**
  - 10,000 in-shore fishermen with 4,000 boats
  - Lobsters are main catch and main export from Bahamas generating > B\$ 100 million/year.
  - Boats are insured under marine hull covers, but there is no insurance for lobster condominiums, lobster pots and fishing gear.

### Initial Assessment

- **Requirements:**
  - Insurance Regulation
  - Suitable Primary Insurer
  - International Reinsurance
  - Insurance Fund if no Private Sector Interest
  - Additional Weather Stations

### Demand Assessment Findings

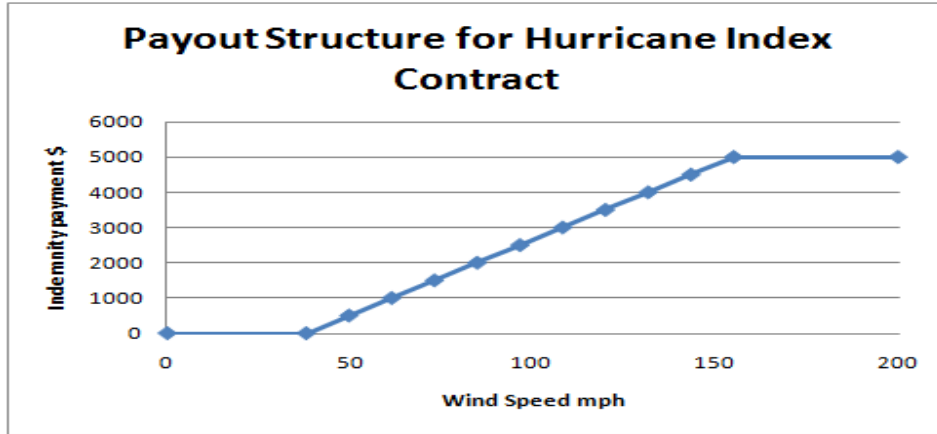
- 75% of surveyed farmers (crop & livestock producers) identified windstorm (Tropical Storm/Hurricane) damage as their key risk exposure over past 5 years
- 20% identified drought as main peril
- 92% of farmers were interested in purchasing hurricane insurance
- **65% of farmers were not willing to pay premium rates > 5% for insurance**

### What is Agricultural Weather Index Insurance?

- **Traditional Crop Indemnity Insurance (>100 yrs):**  
Actual physical loss or damage is measured in-field, and the claim is specific to that field/farmer:
  - Single Peril
  - Multiple Peril
- **Index Insurance (since 2003):** The claim is calculated based on an external index designed to reflect as accurately as possible the loss incurred by the farmer:
  - Crop Area Yield Index Insurance

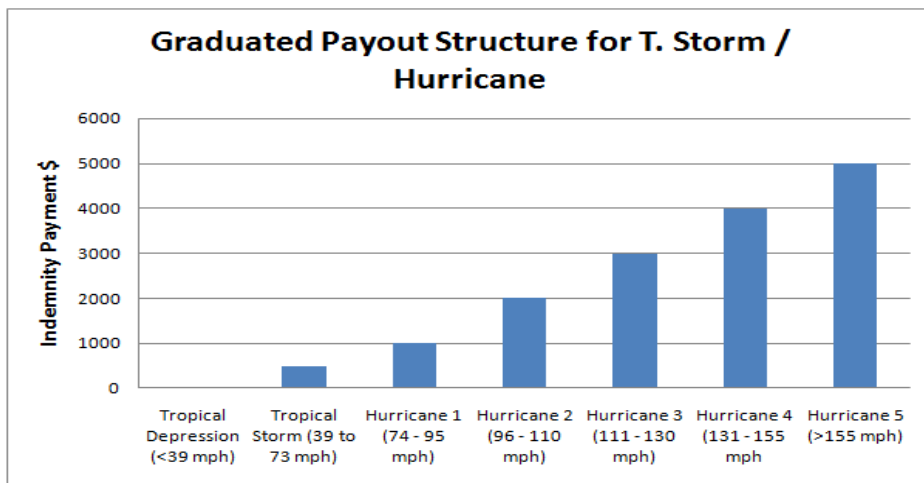
- Crop Weather Index Insurance
- Livestock Mortality Index Insurance

**A Simple Hypothetical Tropical Storm & Hurricane Index Payout structure**



**Weather Index – Issues**

- **Advantages**
  - Low cost
  - Low infrastructure requirements
  - No Anti-Selection
  - No Moral Hazard
  - No in-field loss assessment required
  - Standardized and transparent structure



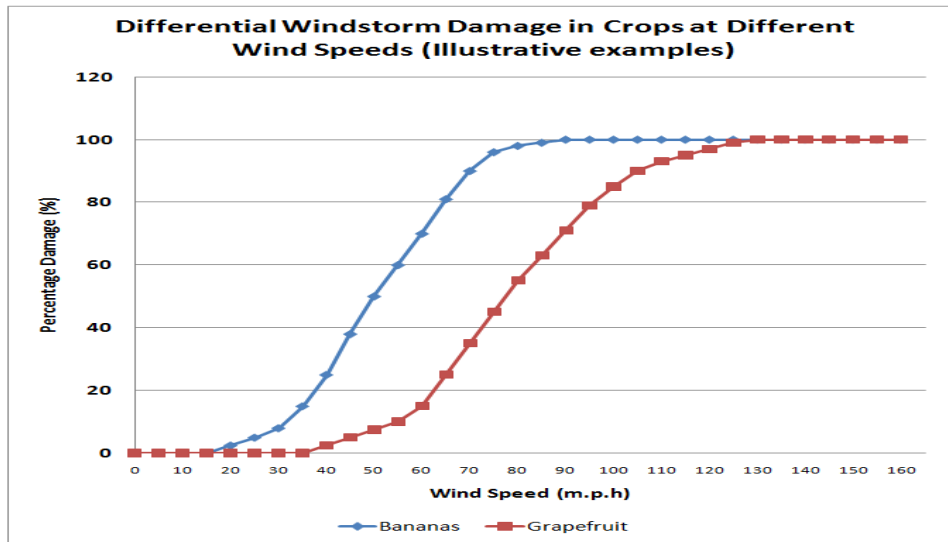
- **Drawbacks**
  - High Basis Risk and therefore low farmer acceptance
  - Representative weather stations required
  - Accuracy of recording meteorological data
  - New legislation may be required



**Example of Tropical Storm and Hurricane Index Cover for Farmers & Fishermen**

|                                       |  |  |                      |                      |                      |                      |
|---------------------------------------|--|--|----------------------|----------------------|----------------------|----------------------|
| Product feature                       | Bahamas: Tropical Storm and Hurricane Index Insurance Product for Farmers, Livestock Producers and Fishermen |  |                      |                      |                      |                      |
| Island                                |  |  |                      |                      |                      |                      |
| Reference weather station             | Official Automatic Weather Station belonging to Bahamas Meteorological Department, BMD, on each Island       |  |                      |                      |                      |                      |
| Insured Interest                      | Crops, Livestock, Fishing Gear (separate products)   |  |                      |                      |                      |                      |
| Index                                 | Named Tropical Storm and Hurricane Categories 1 to 5 as defined by NOAA                                      |  |                      |                      |                      |                      |
| Policy Duration                       | Official Hurricane Season as defined by NOAA from 1 <sup>st</sup> June to 30 <sup>th</sup> November          |  |                      |                      |                      |                      |
| Index Increments                      | Tropical Storm   | Hurricane Category 1                           | Hurricane Category 2 | Hurricane Category 3 | Hurricane Category 4 | Hurricane Category 5 |
| Threshold (windspeed in mph)          | 39 mph   | 74 mph   | 96 mph               | 111 mph              | 131 mph              | >155 mph             |
| Limit (windspeed in mph)              | 73 mph   | 95 mph   | 110 mph              | 130 mph              | 155 mph              |                      |
| Increment (% of maximum policy limit) | 20%  | 50%  | 100%                 | 100%                 | 100%                 | 100%                 |
| Increment (BS)                        | 100  | 250  | 500                  | 500                  | 500                  | 500                  |
| Maximum policy limit (BS)             | 500  | (Policy sold in multiple units of \$ 500/unit) |                      |                      |                      |                      |
| Additional Features of Index          |  |  |                      |                      |                      |                      |

Issues in the Design of an Individual Farmer Tropical Storm & Hurricane Index for Crops – Basis Risk is a moderate concern for Crops



**Issues in the Design of Individual Producer Tropical Storm & Hurricane Index for Livestock**

Basis Risk is likely to be a major issue for Livestock

- How closely will an Island-level Tropical Storm and Hurricane Index correlate with poultry, swine and cattle losses at the individual livestock producer level?

- Wind storm hazard as measured by wind speed is not the major cause of livestock mortality. Main causes include:
  - Flooding or storm surge associated with the TS/Hurricane leading to *drowning* of the animals/poultry
  - Collapse of buildings housing the livestock due to wind and or flood and or tidal surge, *crushing* the animals to death
  - But flooding/drowning of animals may also occur due to excess rain not associated with TS/Hurricane (Basis Risk)
- Add excess rainfall index as a proxy for flood?

**Issues in the Design of Tropical Storm & Hurricane Index for Fishermen (Fishing Gear) - Basis Risk is likely to invalidate the use of a Hurricane Index to insure loss of lobster fishing gear located on the sea-bed**

- Storm Surge associated with TS/Hurricane is one cause of loss of lobster fishing gear;
- However, Sea Swell also causes major losses of fishing gear and this peril is NOT related to TS or Hurricane activity;
- Storm Surge and Sea Swell may account for 50% respectively of damage to lobster fishing gear.

**CONCLUSIONS**

- **The design, rating and implementation of a TS/Hurricane Index Insurance to protect individual farmers, livestock producers and lobster fishermen may be technically and financially difficult for the following reasons:**
  - Basis Risk which applies to crops (moderate issue), livestock (major issue) and especially to lobster farmers/their fishing gear (un-insurable problem?)
  - Scale of programme and interest from insurance sector. A voluntary index product which insures only crop producers (and possibly some livestock producers) may lack sufficient demand and critical mass to be financially viable and of interest to commercial insurers / reinsurers?
  - Demand for insurance and farmer's ability to pay premiums. Although the level of potential demand appears high (92% of surveyed farmers), very few are willing to pay the potentially high premiums which would be required for hurricane index insurance.
- Insurance can only be implemented if insurance companies perceive profitable commercial opportunity to exploit in the medium term.
- No Insurance will be financially viable without the full support of reinsurers.

**ALTERNATIVE RISK MANAGEMENT OPTION FOR CONSIDERATION**

A Meso-level or Aggregate (per Island per Event) to supplement or replace the existing ex-post disaster compensation payments may provide an alternative to individual farmer / fishermen hurricane index cover. Such an aggregate hurricane index might draw on the lessons and experience of the **Caribbean Catastrophic Risk Facility (CCRIF)**

## KEY CONSIDERATIONS FOR DEVELOPMENT OF CROP INSURANCE IN THE CARIBBEAN

### Start with Risk Assessment

- **Which Perils?**
  - TS/Hurricane
  - Excess Rain/Flood
  - Seasonal Drought
  - Tsunami
- **Which Type of Crop Insurance Product?**
  - Traditional Indemnity Insurance (named peril damage-based vs. all risk (MPCI) yield shortfall cover)
  - Index-based Insurance – excess rainfall and rainfall deficit
- **Target crops / target audience?**
  - Sugar/rice/peanut/banana/other
  - Targeted farmers: subsistence/semi commercial/commercial
- **Requirements of other agricultural sectors (livestock, fisheries, forestry)?**
- **Legal & Regulatory**
  - Special law may be needed for index insurance
- **Farmer demand studies**
  - *At feasibility study stage:* to identify farmers risk exposures, insurance needs and potential demand for insurance
  - *At crop insurance product design stage:* to test and refine prototype crop insurance products with farmers and their potential ability / willingness to pay premiums
- **Identification of potential stakeholders and define roles**
  - Insurance Association, Private Insurance Company(ies)
  - Rural distributor/Agent: e.g. Farmer associations, Rural banks, MFIs
  - Government Agencies: MOA, Meteorological agencies etc
  - Role(s) of Government in promoting / supporting agricultural insurance
  - Private-Public Partnership
- **Technical design and rating**
  - Data requirements for rating (time-series yields /production loss / weather data)
  - Need to include catastrophe loading
  - Role of 1<sup>st</sup> loss deductibles
  - Policy wordings
- **Financial and Reinsurance**
  - Few insurers can retain catastrophe wind or flood exposure and therefore require reinsurance
  - Restricted windstorm and flood reinsurance capacity
  - Establish early dialogue with reinsurers at design stage
- **NEED FOR PILOT TESTING PRIOR TO SCALING UP NEW CROP INSURANCE PROGRAMMES**

**A PRE-FEASIBILITY ASSESSMENT OF WEATHER RISK MANAGEMENT TOOLS IN GRENADA**

MR. GUIDO MARCELLE

CHAIRMAN, THE GRENADA NUTMEG REVITALIZATION STAKEHOLDER COMMITTEE

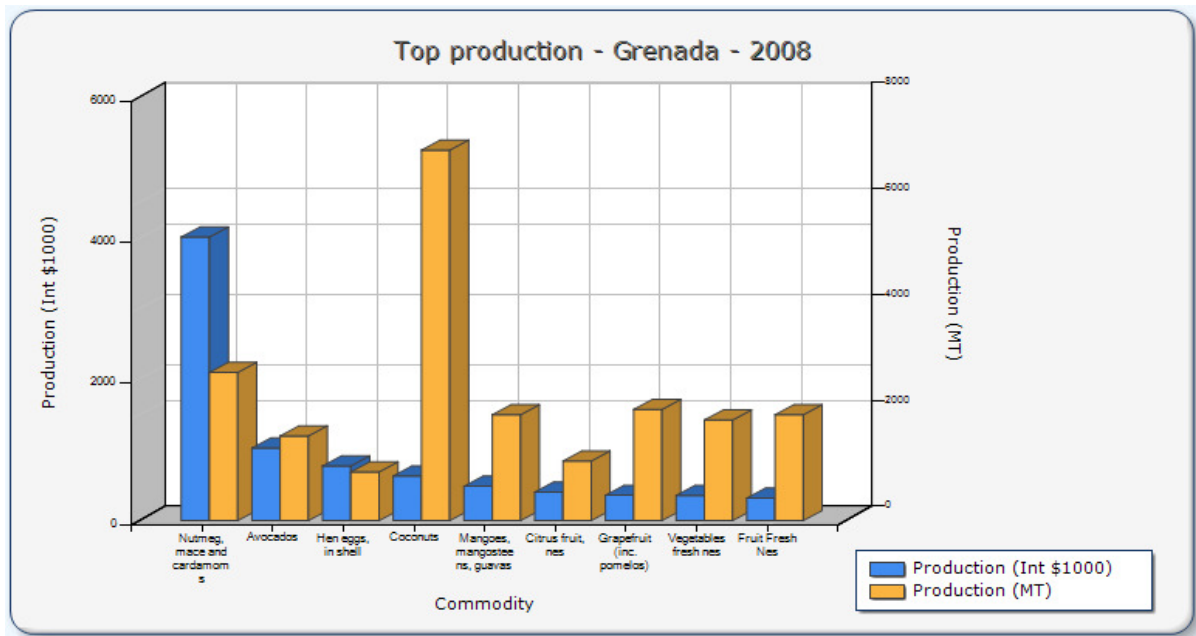
**Main Household features in Grenada - Smallholder farmers produce a wide variety of fruit and vegetable crops, cocoa, nutmeg and some livestock products.**

| Yearly results of nutmeg production (GCNA) <sup>1</sup> |      |      |      |      |      |      |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
|   | Year |      |      |      |      |      |      |      |      |      |      |      |
|   | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| <b>Farmers (number)</b>                                 | 6075 | 6555 | 6670 | 6717 | 6626 | 6843 | 5574 | 1955 | 1996 | 2055 | 2401 | 2560 |
| <b>Production/farm (Equivalent WT. LB)</b>              | 799  | 993  | 858  | 798  | 724  | 967  | 1157 | 912  | 251  | 293  | 291  | 308  |
| <b>Revenue/farm (EC\$)</b>                              | 1838 | 3514 | 3747 | 4188 | 3931 | 4640 | 3262 | 2965 | 816  | 658  | 1340 | 617  |

<sup>1</sup> Year begins 1 July and ends 30 June

**THE AGRICULTURAL SECTOR:**

Nutmeg and mace have traditionally been the major exports and Before Hurricane Ivan Grenada was the world's second-largest producer after Indonesia, supplying one-quarter of world demand.



Source: FAOSTAT, 2010

**NATURAL DISASTERS IN GRENADA – hurricane Ivan affected 60% of the population with damages in excess of US\$800,000 million**

*Hurricanes and floods:*

| <b>Disaster Date</b>    | <b>No. individuals Affected</b> |
|-------------------------|---------------------------------|
| Storm (Ivan) 08/09/2004 | 60,000                          |
| Storm 17/07/2005        | 1,650                           |
| Storm 26/07/1990        | 1,000                           |
| Storm 15/11/1999        | 210                             |

| <b>Disaster Date</b>    | <b>Damage (000 US\$)</b> |
|-------------------------|--------------------------|
| Storm (Ivan) 08/09/2004 | 889,000                  |
| Storm 15/11/1999        | 5,500                    |
| Storm 04/08/1980        | 5,300                    |
| Flood Nov-75            | 4,700                    |

Nutmeg production is not shock resilient it requires 15 – 20 years to full recovery.

15 - 20 years after hurricane Janet in 1955 production was recovered.

Production decreased by 85% respectively after hurricanes Ivan in 2004 and Emily 2005.

| Long-term yearly results nutmeg sector (GCNA) <sup>1</sup> |                                       |                                     |
|--|---------------------------------------|-------------------------------------|
| <b>Period</b>  | <b>Nutmeg<br/>(Equivalent WT. LB)</b> | <b>Mace<br/>(Equivalent WT. LB)</b> |
| 1951-1955 <sup>2</sup>                                     | 5,021,159                             | 692,000                             |
| 1956-1960  | 1,192,979                             | 176,355                             |
| 1961-1965  | 1,548,151                             | 237,809                             |
| 1966-1970  | 2,780,909                             | 397,573                             |
| 1971-1975  | 4,027,174                             | 540,136                             |
| 1976-1980  | 5,178,369                             | 659,887                             |
| 1981-1985  | 5,194,024                             | 433,090                             |
| 1986-1990  | 5,871,140                             | 627,396                             |
| 1991-1995  | 5,051,494                             | 304,596                             |
| 1996-2000  | 5,313,941                             | 406,835                             |
| 2001-2005 <sup>3</sup>                                     | 5,000,005                             | 310,718                             |
| 2006-2009  | 1,294,866                             |                                     |

<sup>1</sup> Year begins 1 July and ends 30 June  
<sup>2</sup> Hurricane Janet in 1955  
<sup>3</sup> Hurricanes Ivan in 2004 and Emily in 2005

**Cocoa production reacts more quickly to shocks and 5 years after hurricanes Ivan and Emily the sector has recovered almost completely.**

| <b>Year</b> | <b>Total production (LB)</b> | <b>Average price<br/>(EC\$/LB)</b> |
|-------------|------------------------------|------------------------------------|
| 1998        | 2,558,992                    | 1.16                               |
| 1999        | 2,512,375                    | 1.24                               |
| 2000        | 2,699,608                    | 1.26                               |
| 2001        | 1,781,278                    | 1.49                               |
| 2002        | 1,725,316                    | 1.76                               |
| 2003        | 1,507,357                    | 1.81                               |
| 2004        | 1,829,987                    | 2.24                               |
| 2005        | 11,859                       | 2.13                               |
| 2006        | 169,724                      | 2.50                               |
| 2007        | 484,531                      | 3.12                               |
| 2008        | 783,989                      | 3.24                               |
| 2009        | 1,021,060                    | 3.24                               |

### **Project background information**

- FAO - Exploratory survey on risk management along the value chains in the Caribbean under the EU funded All ACP programme (in 2008).
- Consultations with the Nutmeg Revitalization Committee and other representatives of the private and public sector (in the course of 2008 and 2009).
- Partnership between FAO and the University of Wageningen to undertake a pre-feasibility assessment of risk management strategies to cope with weather risks in Grenada.

### **Project Objectives**

FAO has responded to a request advanced by both the private sector and the Government to assess the pre-feasibility of an agricultural insurance scheme in Grenada.

### **The Nutmeg strategy**

**VISION - A world leading industry by 2015 recognised for its top quality nutmeg, mace and value added products contributing to the sustainable livelihood of the people of Grenada.**

### **Project partners**

- The Grenada Nutmeg Revitalization Committee (including Government representatives, private sector stakeholders, farmers associations and the nutmeg coop);
- Wageningen University

**First phase: data gathering (finalized in March 2010) – information is either limited or unavailable.**

- The field mission objective was to collect primary data in Grenada (e.g. nutmeg and cocoa and other short term crops)
  - Yield data
  - Price data
  - Meteorological data
  - Household income

**Preliminary findings (phase 1)**

- Yield and price data
  - Long time series available for both cooperatives, nutmeg and cocoa, at the national level.
  - Individual farm production data is limited.
  - Long time series are available for meteorological data. However only the data on the rainfall level can be considered as reliable.
  - Information on household income for nutmeg and cocoa producers is not available.

**Second phase: assess pre-feasibility (to be finalized in August 2010)**

Performance of three alternative contract designs: **Preliminary findings phase 2.**

- Yield insurance (indemnity based) –
  - Loss appraisal is difficult since nutmeg and cocoa are harvested over a long and not well identifiable period
  - High transaction costs
- Area based (payouts only when average yields across all farms in the area fall below a critical yield. High correlation between average national yields and the individual farm's yield.
- Weather index (the payout for index insurance is based on specific weather events, such as rainfall deficits or hurricanes).
  - Low correlation between rainfall deficits and production.
  - High correlation between hurricanes and production.

**Third phase – discussion with the Government and Private sector stakeholder – to be held in September 2010**

- **Depending on the results of the pre-feasibility assessment on insurance:**
  - Identification of insurable and non-insurable risks.
  - Identification of insurable and non insurable crops.
  - Role of the cooperatives in the delivery of a potential insurance scheme (nutmeg and cocoa).
  - Role of the Government on disaster risk management.

## SESSION 5: FACILITATED PLENARY DISCUSSION

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**CARICOM:** The necessity of insurance is understood, but it seems that the focus is on weather based risk but other risks exist, a public sector partnership is the only mechanism that will overcome risks. The major risk is Food Security.

**Grenada:** As an institution WINCROP apparently put nothing in place to diversify, it should look at providing coverage for other kinds of production or housing and car insurance.

**CAFAN:** Comment on WINCROP – This is a structure we can build on, years ago it was pushing crop diversification, but banana farmers did not listen. Despite all of this WINCROP has survived. It should be used as a model for future; WINCROP is something we want to push forward

**WINFA:** Does WINCROP cover other commodities such as nutmeg?

**Antigua Bee keepers Association:** Bees have not been mentioned. A mite destroyed 90% of bees in Antigua; the industry is being revitalized with assistance from GEF Barbados. Would bees also be covered in agricultural insurance?

**Panel:**

WINCROP: A diverse array of other kinds of insurance (car, housing etc) was offered but the farmers did not want to pay. Covering Nutmeg; WINCROP approached the nutmeg board in 1990, they asked us to sign coverage, then they pulled out of the agreement since cocoa and nutmeg does not get hit by hurricanes. Since, Hurricane Ivan interest in insurance has resurfaced.



***SESSION 6:***  
***Plenary Debate on Private Sector Strategies***

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Chair: Mr. Zorale Barthely  
People's Insurance Company of Antigua and Barbuda

**POLICY RECOMMENDATIONS TO FACILITATE PRIVATE SECTOR PARTICIPATION  
BY MARK WENNER OF THE INTER-AMERICAN DEVELOPMENT BANK (IDB)**

MR. DAVID C. HATCH

ASSOCIATE DEPUTY DIRECTOR GENERAL, INTER AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE (IICA)

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**MAIN IMPEDIMENTS TO THE DEVELOPMENT OF AGRICULTURAL INSURANCE:**

- Lack of high quality and reliable data series to do the risk modeling so that pricing can be obtained.
- Lack of trust on the part of farmers toward insurance companies.
- Absence of culture of insurance. Many farmers do not understand insurance and need to become more financially literate.
- Lack of trained personnel, namely agricultural insurance specialists, risk modelers, weather scientists, and actuaries to develop the line of business.
- Inadequate and biased regulatory frameworks.

**KEY GOVERNMENTAL ROLES**

- The role of Government should solve the data problem.
- Subsidize the “*first movers*”. Since public resources tend to be scarce, the subsidizers have to be “smart” and temporary. Using permanent and increasing amount of subsidies to grow the manner is not advised.
- Help the private sector actors change the conceptual paradigm.

**KEY PRIVATE SECTOR ROLES**

- To make a strategic to this line of business.
- To engender trust and to be transparent.
- Forge close ties and even “bundle products”.

**JOINT ROLES**

- A spirit of innovation and thinking outside of the box
- Help create group of farmers (cooperatives/associations)

## INTERACTION BETWEEN THE PUBLIC SECTOR AND PRIVATE SECTOR

MR. DAVID C. HATCH

ASSOCIATE DEPUTY DIRECTOR GENERAL, IICA

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Agreed to the need for private- public partnership and Acknowledged commitment of the Ministers and Permanent Secretaries as demonstrated by their presence in the Symposium. A holistic risk management process is recommended and highly commended the organisation of a Regional programme for the Caribbean as a risk management opportunity, however, considered Insurance as a last option.

Recognized the global food security crisis and mentioned that farmers are sleeping giants regarding food security and Indicated that he was a believer of use of traditional insurance where claims management and marketing strategies are used. Reiterated the need to confront reality and figured out ways to address the reality and the working together was seen as inevitable. He defined the term partnership as relationship that was “tied at the hip”. A partnership is important since both would be exposed to the risks and to a profit.

There should be additional layers of risks for the reinsurers since there will be extra loss involving administrative costs and the management of loss of profit. It was pointed out that reinsurers were knowledgeable about risks associate with agriculture and thus would adjust their premiums to suit- profit motive.

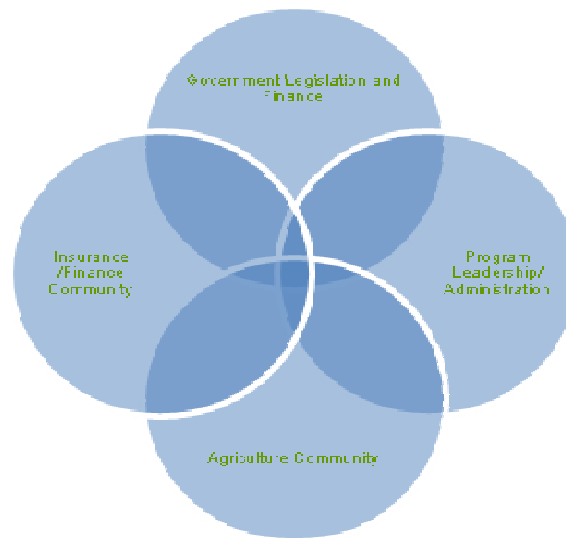
Critical element is the relative stability in the political arena. In the agriculture community inputs, transportation, extension services and insurance culture are all concerns. Strong cooperatives are also very important and Price risks and claims to be handled by the Insurance companies.

Flow can be reversed; there is need for the identification of risks to be undertaken by the Government. Insurers and farmers table a risk and there is no exclusion for stupidity and lack of good farming practices.

### **Private - Public Partnership (nationally & regionally) to ensure success the following:**

- Clear Identities
- Maximize Strengths
- Defined Roles
- Defined Authorities
- Defined Accountabilities
- Shared Risk

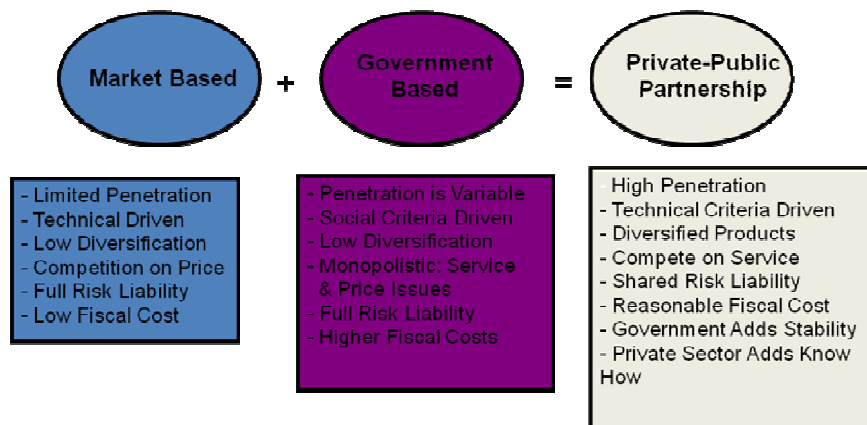
## PREFERRED INSURANCE MODEL: A TRUE PUBLIC-PRIVATE SECTOR PARTNERSHIP



Presented a preferred model- Public and Private sector partnership

- Needed to know who is doing what- who was responsible for what? What are the expectations? Who are the critical players?
- Government t need to take the 1<sup>st</sup> step
- Need regionally, programme
- Need an individual to oversee programme within the region
- Agricultural community- farm to fork: create demand, if producers are not driving the issue of agricultural insurance that it will be difficult to moving forward
- Reinsurance-very important to consider- Agricultural insurance scheme will not work without reinsurance- need them as partners at an early stage

### Three Policy Models



**Private Sector Involvement: Who, Why?**

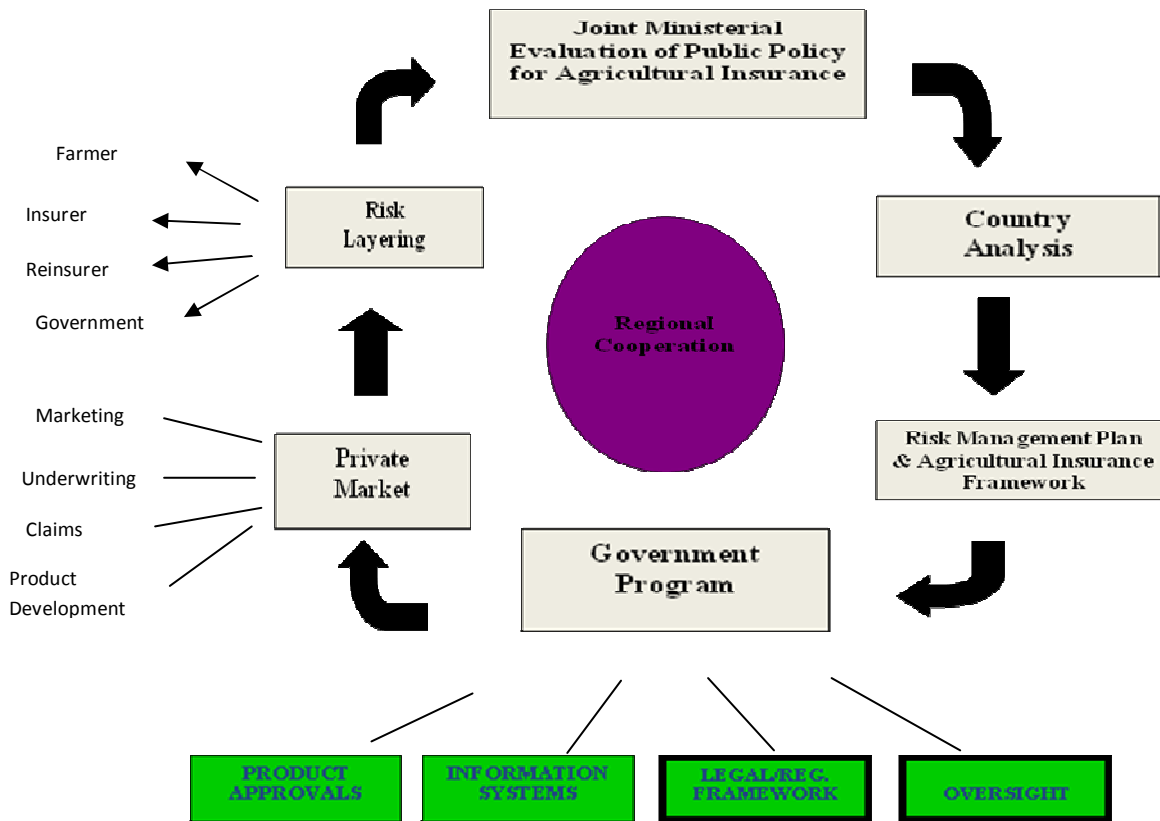
|                                |                              |                             |
|--------------------------------|------------------------------|-----------------------------|
| <b><i>Deploy Expertise</i></b> | <b><i>Build Capacity</i></b> | <b><i>Create Demand</i></b> |
|--------------------------------|------------------------------|-----------------------------|

|                                  | <i>Deploy Expertise</i> |            |               |           |                     | <i>Building Capacity</i> |             |                | <i>Create Demand</i> |                    |
|----------------------------------|-------------------------|------------|---------------|-----------|---------------------|--------------------------|-------------|----------------|----------------------|--------------------|
|                                  | Analyze Risk            | Price Risk | Manage Claims | Marketing | Product Development | Educate Producers        | Train Gov't | Train Insurers | Product Input        | Market Development |
| <b>Producers</b>                 | X                       |            |               |           |                     |                          |             |                | X                    | X                  |
| <b>Cooperatives/Associations</b> | X                       |            |               | X         |                     | X                        |             |                | X                    | X                  |
| <b>Agents</b>                    | X                       |            | X             | X         |                     | X                        | X           | X              | X                    | X                  |
| <b>Insurers</b>                  | X                       | X          | X             | X         | X                   | X                        | X           | X              |                      |                    |
| <b>Reinsurers</b>                | X                       | X          |               |           | X                   |                          | X           | X              |                      |                    |

Presented a sequencing framework for developing agricultural insurance scheme

- Ministerial decision- was agricultural insurance required?
- Consider World Bank proposed model in deciding the way forward
- Financial analysis- Cost of credit; availability of credit
- Evaluation of the risk should be private sector driven as well as taking the lead on the issue on claims
- All partners should bear a certain portion of the risk
- Framework diagram- no exclusion for stupidity and for bad farm practices
- If reinsurers do not have confidence on farm practices, then they may set premiums high that it would be unaffordable or choose not to insure

## SEQUENCING FRAMEWORK FOR DEVELOPING AGRICULTURAL INSURANCE



## REINSURER EXPECTATIONS OF THE COUNTRY

### Ideal Market

- ✓ Government commitment to public-private partnerships
- ✓ Solid rural infrastructure
- ✓ Market oriented farmers with emphasis on commercial agriculture
- ✓ Functioning export markets
- ✓ 2-3 major crops covering a significant region with reasonably homogenous soil and climate conditions
- ✓ Stable institutional framework; Insurance and financial regulation & incentives for companies to invest in crop insurance
- ✓ At least 1 insurer specialized in agriculture or the absence of a large number of insurers experimenting or competing agricultural insurance

### Their Commitment

- Build Capacity of the governments, local insurers, agribusiness industry
- Contribute resources: insurance platform, product development, local/ international partners

## THE DISCIPLINE OF MARKET LEADERS

- **Choose Your Customers, Narrow Your Focus, Dominate Your Market**
  1. Customer Intimacy- deliver what clients want
  2. Operational Excellence-low price/hassle-free service
  3. Product Leadership- push performance boundaries
  
- **Mobilize All Resources to the Chosen Discipline**
  1. Systems and Structure
  2. Resource Allocation and Incentives
  3. Capacity Building
  
- **Confront Your Reality and Ask Tough Questions**
  - Phase I: Understand the Status Quo of Your Business
  - Phase II: Identify the Realistic Options
  - Phase III: Detailed Design and Hard Choices
  1. How will you produce superior value?
  2. What is the business case for pursuing the market? (cost, benefits, risks)
  3. How will you transition?

## MOST STRATEGIC AGRICULTURAL QUESTION

- What Crops Should Be Grown in the Caribbean?
  1. Long-term Market Demand
  2. Market Niches/Cultural Niche
  3. Natural Resources by Country
  4. Climate Risk
  5. Labor Force
- Supporting Decisions
  1. Risk Management
  2. Credit and Insurance
  3. Technologies
  4. Infrastructure
  5. Value Chain
  6. Capacity Building

### Think Linkage

- Correct risk management programmes will include sound insurance mechanisms
- Sound insurance mechanisms enable producers to rebuild and/or avoid returning to poverty
- Sound insurance mechanisms accelerates credit availability
- Affordable credit is critical to expanding agriculture
- Correct crop selection and supporting decisions position agriculture to be sustainable

- Sustainable agriculture stimulates the economy, creates jobs, increases civil stability, improves food security, eliminates hunger and reduces poverty
- Private-public partnerships are fundamental to sound and enduring risk management programmes

**CONCLUSIONS:**

Strategy to determine what crops to insure and grow involve the following:

- Start with reinsurance
- Integrate risk management plan
- Strategic planning in determining which crops to grow
- Partner with the private sector
- Adopt World Bank risk management model
- Nurture and expand WINCROP and CCRIF
- Create onsite expert at country and regional level
- Evaluate existing products to determine the right mix for the region



## PRIVATE INSURERES EXPECTATIONS AND PERSPECTIVES WITH REGARDS TO AGRICULTURAL INSURANCE

MR. PHILLIP GITTENS OF GRENADA AND MS. GAYLE MARSHALL OF BARBADOS

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Mr. Gittens gave a private sector perspective referencing experiences of Hurricane Ivan in Grenada (2005).

He noted that prior to Hurricane Ivan few home owners bought insurance. There was also the common feeling in government that there is no need for insurance or reinsurance. Less than 20% of homes insured there was 90% destruction. Within the first six months after the hurricane, the insurance was able to make an input of 480 million EC dollars into the economy of Grenada. This has not been recognized to date by the government.

It is important that the Government Ministers be informed and for the understanding of the importance of what insurance can do after a catastrophic event. Education is important and can create enthusiasm starting with the high ranking government officials and technical officers. There is also the need to build confidence in the insurance industry.

Regulation of the industry in the Region has been proving a problem. A multiple cover holistic approach is recommended since in the event of disaster, even personal property (home, vehicle, machinery) and not just the farm (agricultural business) will be affected.

Ms. Marshall added that most companies in Barbados have fire insurance for their sugar cultivation and this is mainly for the sugar cane which has to be burnt for processing. This is the extent of agriculture insurance available in Barbados. It is thought that agriculture insurance schemes will involve a lot of work in that there will be different types of risks to be accounted for the different crops. A company has already been identified as a possible reinsurer and the conditions required to be met for this company will have to be met.

## FACILITATED PLENARY DISCUSSIONS

Panel: Mr. David Hatch – IICA; Phillip Gittens (Insurance) – Grenada; Gail Marshall (Insurance) – Barbados

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### Questions/ Interventions :

#### **CAFAN (A. Murray – Jamaica)**

Risk mitigation is essential e.g. use of irrigation to reduce pest & disease, use of resistance varieties, disease free planting material and most suitable planting dates.

Main concern in the Region is if there is enough money to re-tool the agriculture industry? How can funds be accessed for the development of the farmers?

**Alvin Langlais – CAFAN** - How possible is a holistic approach to insurance since such a product will be very expensive? How are the farmers going to insure all their assets bearing in mind the farmer resource base?

**Keeley Holder – CAFAN** – Farmers practices in reducing risks by Use of more than one type of crop and the use of Proper management system, how would insurance proceed to insure more than one crop per farmer?

#### **C. Codrington, Junior Minister of Agriculture, Antigua**

Raised concern on the substitution of LOCAL GERMPASM by GMO seeds- Inquired on the possibility of providing insurance to protect seed banks (local) in the event of elimination of any of the local germplasm.

#### **Guido Marcelle – Grenada**

Why the need for further qualification if you are bringing all your business to the same insurance?

#### **Hilson Baptiste, Minister of Agriculture – Antigua**

Indicated that Government has a role to play to include:

- Leasing of land
- Creating the policy and legislative environment - Indicate the need to harmonize legislation among regional territories
- Facilitate group insurance packages to facilitate insurance for agriculture businesses. There is need for this 10 Billion Dollar Agriculture industry to be insured.

### Panel Response:

#### **David Hatch - IICA**

With respect to where to get funding and assistance:

- Great deal of world attention for food security great deal of resources approximately over 20 Billion from countries.
- Need to work with IICA office in Jamaica to further promote and support farmers risk mitigation practices
- Interaction with potato growers association (Jamaica) for technical expertise and funding.

With respect to insuring all entities: Because there are different entities Agriculture Insurance providers will not cover car health and home as well as agriculture, different actuaries, prices, reinsurers etc. are involved. This was tried in the USA but was unsuccessful.

**Response to Keeley Holder**

2- 3 crops reinsurers require before justifying participation in a country....

**Response to Junior Minister**

No company involved in insurance for seeds. In Norway there are seed banks where there are storages of natural seeds. It is felt that GMO's are the way to go to combat the food shortages expected worldwide. Politics has a vital role to play in the use of these types of seed.

**Phillip Gittens**

Risk Mitigation must be done and reinsurers need to be found. Need to demonstrate and educate the public on the thinking of the people of the Region. Fear in the insurance industry is a driving factor and not the product of insurance which is defective. The absence of Regulation of the industry is a major factor contributing to this. There is a need to purchase holistic insurance collectively since if purchased individually it will be very expensive. Data collection on agriculture production is almost nonexistent at present and this is very necessary.

**Guido Marcelle**

Changing times ...need to purchase in a one shop scenario.

**Sergio/ CARICOM**

Need to come up with a mechanism to fund agriculture. CARICOM has a policy on Biodiversity.

# **PRODUCER ORGANISATION PERSPECTIVES**

**SESSION 7:**  
***Producer Organisation Strategies in Managing Risks  
in Caribbean Agriculture***

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Chair: Mrs. Lystra Fletcher-Paul  
Food and Agriculture Organisation

## **INTRODUCTION**

Disaster Risk Reduction (DRR) is a corporate priority in OXFAM GB because we recognize that we will be unable to fulfill our mission to overcome poverty and suffering if we cannot address the impact of disasters on people's livelihoods. Livelihoods interventions that do not take into account disasters and the risks they pose to livelihood will have limited impact on poor producers and the most vulnerable, particularly women.

At the same time, if Disaster Risk Reduction (DRR) measures are not built on livelihoods and gender analysis they are less likely to build sustained resilience. For this reason OXFAM has strictly linked its DRR work with the strategic AIM of the organisation that is the RIGHT TO A SUSTAINABLE LIVELIHOOD and to a Gendered Justice perspective as a mean of addressing key developmental issues.

## **CONCEPTUAL STARTING POINT: WHY MAINSTREAM DISASTER RISK MANAGEMENT, LIVELIHOOD AND GENDER**

### **What is Livelihood?**

"Livelihood refers to the capabilities, assets, and strategies that people use to make a living; that is to achieve food security and income security through a variety of productive economic activities."

### **OXFAM GB position on the relationship between DRR and Livelihood is that:**

- Disasters cause loss of productive assets and disruption of markets, affecting availability and access to food and thwarting people's efforts to build sustainable livelihoods.
- Living with high levels of risk undermines poor people's ability to develop their livelihoods.
- Livelihoods which limit exposure to hazards and depend on multiple and diverse sources of income, enable people to become food- and income-secure, and develop higher levels of resilience to disasters.
- Public policies that guarantee social protection transfers to the most vulnerable can reduce chronic food and income insecurity, limit loss of assets and facilitate recovery from disasters
- In Latin America and the Caribbean (LAC) a large portion of the poor population work in agriculture as small holders and are the most vulnerable to disaster. A large portion of these small holders are women
- Disasters affects women differently than men, they will have different needs, vulnerabilities, priorities and capacities and any DRR strategy that is employed should take into consideration these differences
- DRR strategies cannot be gender blind or neutral as women and their livelihoods are more vulnerable than men. Women's responsibility for caring (for children, elderly, the sick) and for reproductive work (cooking, cleaning, washing) means that disasters and its effects impact disproportionately on women and their workload. Hence, gender roles dictate that women become the primary caretakers for those affected by disasters substantially increasing their emotional and material work load
- In periods of disaster women are vulnerable to reproductive and sexual health problems, and increased rates of sexual and domestic violence
- Women's vulnerability is further increased by the loss of men and/or livelihoods, especially when a male head of household has died and the women must provide for their families. Post disaster stress symptoms are often but not universally reported more frequently by women than men
- Gender inequalities in social, economic and political spheres results in vast differences between men and women in emergency communication; household decisions about use of relief assets; voluntary relief and recovery work; access to evacuation shelter and relief goods; and employment in disaster planning, relief and recovery programmes to name some
- Women play a central role within the family, securing relief from emergency authorities, meeting the immediate survival needs of family members and managing temporary relocation

## **OXFAM GB APPROACH TO DRR: WORKING WITH PRODUCER ORGANISATIONS – programme principle based on working with others to achieve political commitment to disaster risk reduction**

Most of the work we do in LAC is with producers groups assisting with market access and strengthening the livelihoods of these groups. The development of disaster risk reduction strategies is one way we help to strengthen the livelihood of these producer organisations. In most contexts, OXFAM works in partnership with local and national organisations/institutions and with producer organisations

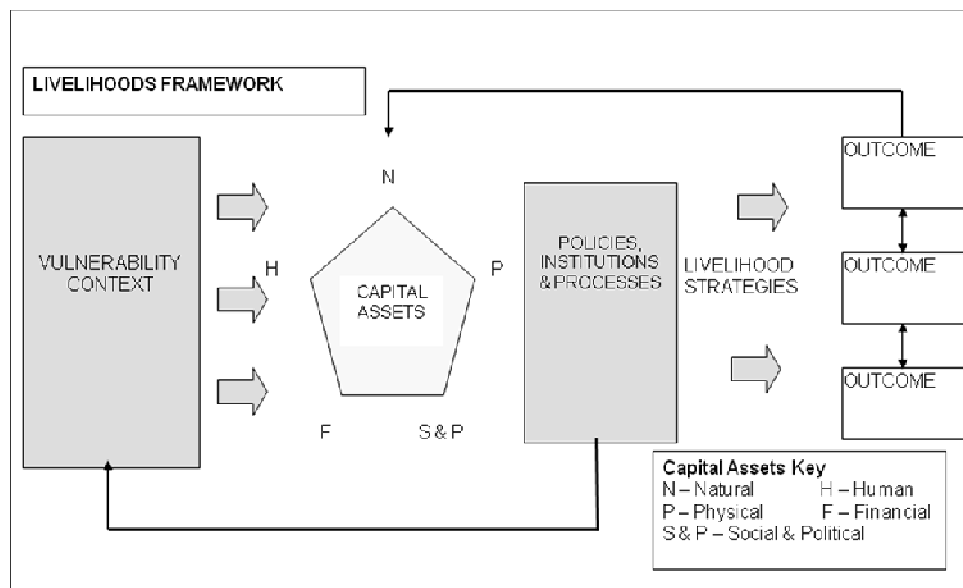
With respect to producer organisation we work to ensure that models, methodologies, tools and strategies that are developed are context specific, replicable and adapted to partner capacities. Furthermore any risk management system that is put in place should consider livelihoods and gender analysis. Also any disaster risk reduction management system that is employed should be in line with the Hyogo Framework of Action.

Participatory tools such as the Participatory Vulnerability and Capacity Analysis (PCVA) can be useful in understanding livelihood vulnerabilities and to plan disaster risk management strategies. It is also a useful tool in mainstreaming disaster risk reduction into livelihood strategies

### **STARTING POINT: THE SUSTAINABLE LIVELIHOODS FRAMEWORK (SLF)**

OXFAM uses the Sustainable Livelihoods Framework (SLF) in guiding context analysis as well as programme design and evaluation. The Sustainable Livelihoods Framework highlights the five categories of assets upon which livelihoods depend: **natural, human, physical, financial, and social and political**

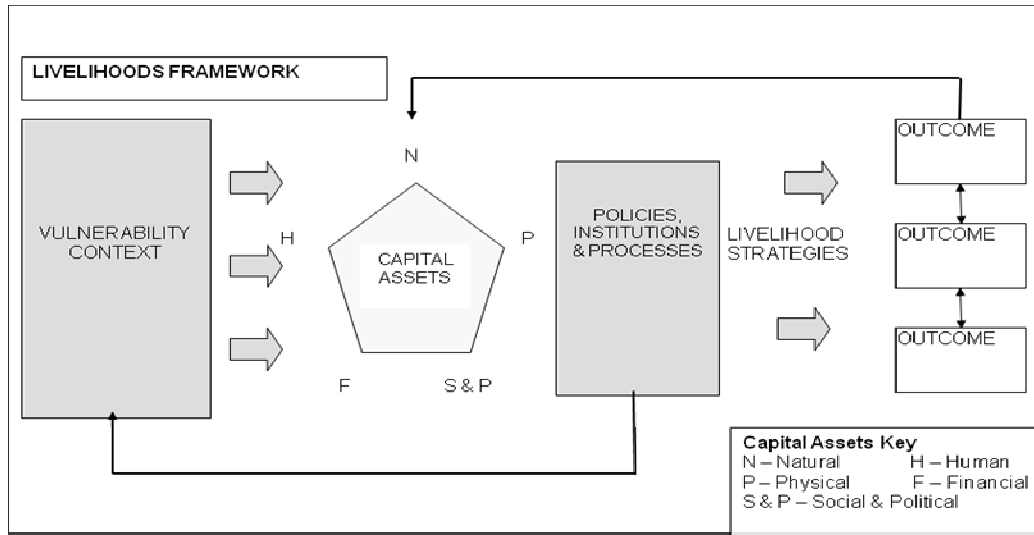
### **SUSTAINABLE LIVELIHOODS FRAMEWORK (SLF)**



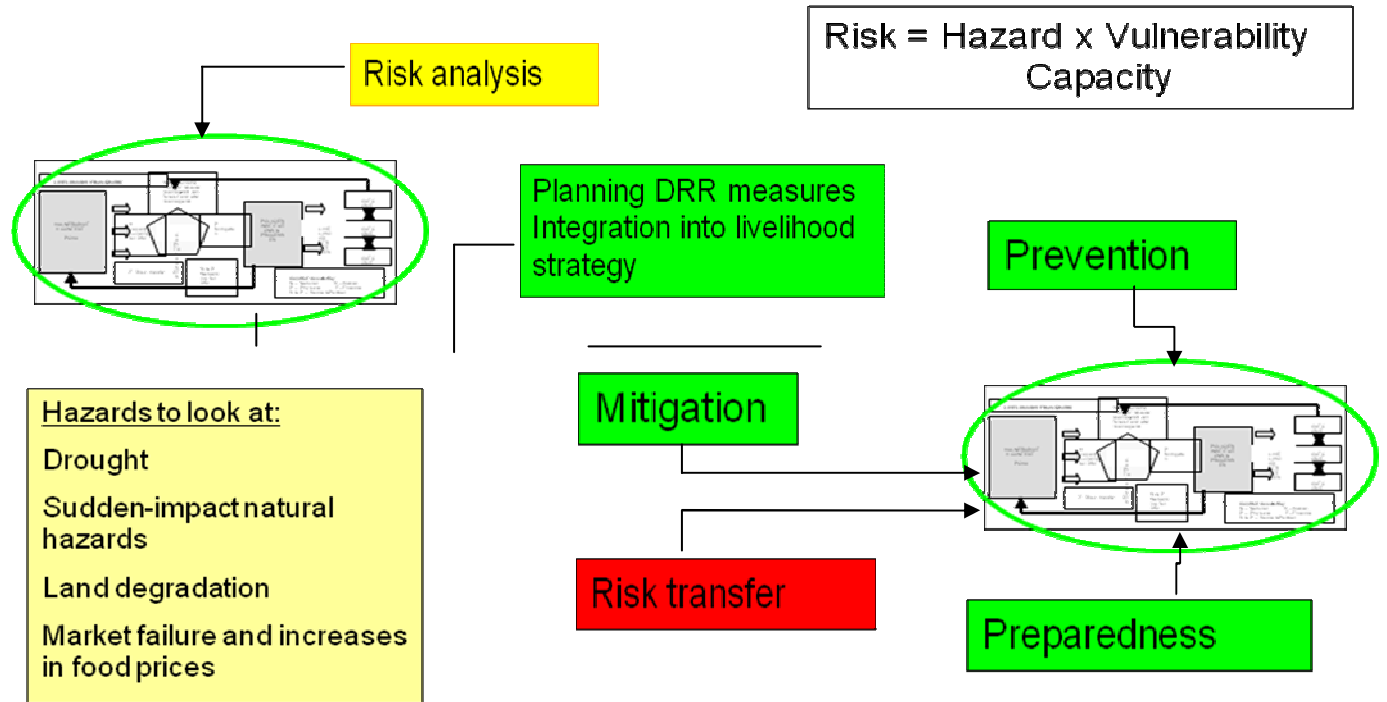
### **HOW TO INTEGRATE DISASTER RISK MANAGEMENT (DRM) INTO THE SLF**

Taking a DRR approach does not mean we have to establish new or distinct projects, since risk is most effectively reduced when DRR principles are internalized into wider programming. For example, existing producer groups can be used to undertake preparedness planning and DRR activities can be introduced in ongoing programmes. With the financial support of the European Commission Humanitarian Aid Department (ECHO), OXFAM is piloting this integration model in Haiti and Jamaica.

**PARTICIPATORY VULNERABILITY AND CAPACITY ANALYSIS (PCVA) FRAMEWORK**



**FROM PCVA TO DRM PLANNING**





**Some examples: policies Institutions in the context of vulnerability – risk analysis for prevention and vulnerability reduction**

- Contingency planning for farmer producer organisations at community level.
- Integration of farmer producer organisation into disaster management coordination mechanisms.
- Advocate for improved agricultural policies, regulation to stabilize food prices, and subsidies that support food production.

**Some example: Insurance**

**Some of the OXFAM market access and financial services strategies.**

- Use gendered market chain analysis to help improve value addition and access to market services.
- Establish or facilitate links with credit institutions that offer lower interest rates.
- Improve access to crop and livestock insurance.
- Introduce producer groups to collective farming that helps to provide income.
- Phase emergency cash transfer programmes into ongoing safety net programmes in areas of chronic vulnerability

Based on the experience of the focus group in St. James, Jamaica, where farmers signed up to the insurance scheme in the framework of the EU Banana Support Programme, only 4 out of the 14 farmers interviewed were on the insurance plan.

Why are you not participating?

- Did not hear about the project
- Lack of confidence with governmental institution (RADA) to assist. Damage assessment (external technician).

What Benefits will you receive?

- Not sure, may be fertilizer/oil, suckers if necessary

Have you received any documents/policy that explains the insurance? **NO**

Can you access any other funds to recover from a disaster e.g. Bank credit?

- Not from financial institution (No assets e.g. land title, equivalent in cash).

How would you design programme?

- Farmers Group or CBO to be in charge of insurance scheme (reduced bureaucracy, quick access to funds to resuscitate their farms).
- Private sectors preferred compared to governmental agencies to be in charge of programme.

What disaster do you expect to be covered?

- Hurricane, Landslide , Flooding, Drought, Disease, Pests, Fire

What are your expectations?

- To receive: tools, seeds, fertilizer, chemical, equipment, money to cover at least 25% of expected yield destroyed.

**CONCLUSION AND RECOMMENDATIONS**

- Managing risk is of vital importance to the traditional farming sector. However Sustainable Disaster Risk Management Strategies must take into account comprehensive livelihood and gender analysis
- Participatory tools like PCVA can prove to be effective in mainstreaming DRR integration and gender analysis into livelihood strategies

Insurance schemes can be a valuable risk transfer mechanisms in traditional farming however:

- While states might provides insurance to small farmers, private sector has a great potential if capable of adapting classic insurance scheme to small farming reality particularly the realities of women producers
- Local schemes managed by farmers organisation that can provide insurance to their own producers shown more potential for success then classic commercial insurance schemes
- Multi hazard insurance scheme should be considered as they would better respond to traditional farmers' needs and the differentiated needs of men and women producers in terms of exposure.
- There is the need to improve on classic insurance schemes and piloting and/or expanding new insurance mechanisms (best practices)

## FROM SEED TO SALE - HOW FARMERS CAN REDUCE RISKS IN VEGETABLE CROP PRODUCTION

MESSRS. JETHRO GREEN AND KEELEY HOLDER  
CARIBBEAN FARMERS NETWORK (CAFAN)

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The Caribbean Farmers Network is a regional network comprising Farmers Organisation in thirteen Caribbean countries with a membership of over 500,000 farmers. CAFAN's mission is to enhance Caribbean food and nutrition security, foreign exchange earnings and foreign savings, by repositioning agriculture through the capacity building of farmers and the institutional strengthening of farmer's organisations.

### Risk & Disaster

|  |   |  |   |  |
|--|---|--|---|--|
| <b>RISK</b><br>Profitability<br>of hazard occurrence | = | <b>HAZARD</b><br>Potential threat to<br>humans & their welfare | + | <b>VULNERABILITY</b><br>Exposure &<br>susceptibility to losses |
|--|---|--|---|--|

**DISASTER**  
Realization of a risk

### Major Risks of Concern to CAFAN are:

- Weather - Largest risk factor this decade; Alters seasonality of production; Interferes with steady market flow needed to keep consumers buying and Increase market competition.
- Production Risk - Pest & disease outbreaks
- Food Safety Concerns - GAPs
- Praedial Larceny (Crop Theft) - Market Access

### Basis of CAFAN's Decision Making

- Sentiment vs. Practicality
- What to do first?
  - Cheap vs. Costly to implement
  - Tackle top constraints/costs
    - Fertilizer
    - Water
    - Pest management
  - Ease of assimilation
  - Sustainable vs. Stop Gap

### Basis of CAFAN Selecting Suitable Crops

- Market: demand, competition, shelf-life,
- Profitability assessment
- Topography: mountainous, gently sloping, flat
- Season: wet / dry
- Irrigation: rain-fed, drip, sprinkler, big gun
- Labour: cheap, expensive, easy to find
- Crop Theft: Which crop is easier to steal?
- Pest, Disease, Weed Mgmt & Crop Rotation

Legumes ⇨ Crucifers ⇨ Vine Crops ⇨ Roots & Tubers

- Succession planning: What next?

## Marketing

The DISCIPLINE of Market Leaders

- Customer Intimacy
- Operation Excellence
- Product Leadership

## Praedial Larceny (Crop Theft)

- Crime requires multi-faceted intervention
- Minimize incidences vs. Eradication
- Identify thieves - Workers, associates of workers, neighbors, outsiders, professional crop thieves
- Avoid sharing production & harvest information
- Assess most vulnerable areas at least twice daily
- Encourage workforce loyalty and trustworthiness
- Patrol farms 1-3 weeks prior to harvest at peak hours for stealing
- Grow crops less attractive to steal Beans, okras, cucumbers, peas
- Crime is a SOCIAL problem
  - **Get community involved (neighborhood/farm community watch)**
  - **Sponsor community activities/festivals**
  - **Support religious institutions in area**
  - **Donate to less fortunate groups**
  - **Crime stoppers Hotline**
  - **Use media to inform public when thieves are caught stealing**
  - **Advocacy & public awareness**
  - **Keep adding & updating strategies**

## Difference between Commercial Farming and Backyard Gardening.

**Commercial Farming is seen as a** Livelihood, and should be Sustainable and Profitable by being Consumer-driven; Cost-effective; Consistent; and quality driven. Commercial producers are important for Food Security.

**Backyard Gardening is done generally to** Save money; Eat fresh produce; Therapeutic; Not sole income; does not need to be of commercial quality and consistent yields not required.

## WAYS OF REDUCING RISKS IN CROP PRODUCTION:

### Promote Sustainable Land Management

- Divert water
- Plant grass waterways
- Proper cultivation
  - Conservation tillage
  - Strip tillage
  - Zero tillage
- Break up hardpans

### Use Healthy Seeds

- Online Access for Breeders vs. Distributors
- Selecting Seeds
  - Open Pollinated vs. Hybrids
  - Heat-tolerant,
  - Drought-tolerant
  - Resistant to diseases
    - TMV, Downy Mildew, Blight...
  - High yielding
  - Dwarf-size plants
  - Large fruit, miniature fruit
  - Long shelf-life

- Brix (Sweetness), Flavour
- Genetically-modified

#### **Conduct periodic Soil Test & Nutrient Management**

- Measures soil nutrients & pH
- Maintains optimal nutrient levels in soil
- Recommendations for organic & chemical fertilizers
- Feed plants a balanced diet
- Reduce susceptibility to disease & insect pests attack

#### **Promote Water Storage**

- Reduce impact of drought
  - Maintain constant flow rate- Determine tank size and calculate expected effective precipitation from rainfall. Calculate crop water needs- Calculate supply (days) of storage - $\frac{1}{4}$ " rainfall = 6789 gallons/acre

#### **Promote Integrated Pest Management (IPM)**

Holistic approach; more targeted; less pesticide use; effective application; correct timing; less pest & disease resistance and lower costs

**Promote use of Mulch** to reduce water loss and suppress weeds. Plastic mulches can reduce impact of flooding event and disease problems. Increase organic matter & nutrient uptake added benefits in the case of organic mulches.

**Promote the use of Windbreaks** - protect growing plants from prevailing winds, particularly winds above 40 km per hour; reduce erosion; alter micro-environment to enhance plant growth and intercept chemical drift

#### **Promote Good Harvesting & Post-Harvest techniques** - When is the right time to harvest?

- Appropriate age of fruit/vegetable
- Optimal Flavour
- Handling produce to avoid damage
- Reducing post-harvest spoilage
- Correct packaging
- Optimal storage temperatures
- Climacteric vs. Non-climacteric
- Ethylene-sensitive produce

#### **Cheap**

Land Management; Soil Testing; Agro-met Models; Tensiometers; Class A Pan; IPM; Sprinkler; Windbreaks (plants) and ambient Storage

#### **Costly**

Mulch; Drip Irrigation; Cold Storage; Windbreaks (netting) and water Storage Tanks

#### **Recovery**

Grow short crops

- lettuce, cucumber, zucchini, okra, beans

Grow low-cost crops

- Sweet potatoes, yams, cassava, eddoes, dasheen, Tania, pumpkin

Keep tabs on source of inputs nationally, regionally, globally

Disaster finance plan – expect a disaster every three to five years and personal savings in favorable times. Develop close relationship with the lending agency.

### **Opportunity**

- **Efficient** growers who are meeting **market demands**
- New technologies help lower costs & increase demand
- Partnership with stakeholders to facilitate implementation of best farmers practices to reduce risks

## **RISK POSITION PAPER**

### *1. What are our farmers doing now to reduce risks?*

With regards to flooding, farmers in Trinidad and Tobago are partnering with the Government and other State Agencies to undertake a major river cleaning and dredging exercise especially in heavy production area. In addition, in areas where pests and diseases have been noted there is no movement of planting material out of that area.

In Grenada there is no insurance company that offers coverage which specifically addresses the risks that farmers incur. The National Insurance Scheme provides some relevant and affordable coverage in Grenada. Some NEFO members pay their National Insurance Scheme which in itself is a form of insurance; however, this form of insurance only covers the individual and not his or her farm, also this coverage comes into maturity well into their old age, unless the farmer is rendered unable to work before that time comes. Then, that farmer would be given some small benefit pending recovery or until death.

CARDI is presently trying to identify varieties and breeds which are relatively resistant to such disasters as floods and droughts as well as those which will perform in the higher temperatures which the Caribbean region is already experiencing. It is also increasing its seed/seedling banks in the region, so that when farmers do suffer crop losses from disasters, they will be able to replant immediately and thus have a fairly quick recovery.

### *2. What should we do in the future?*

- Provide better incentives for agriculture based on production levels.
- Initiate a comprehensive insurance for crops and livestock.
- Educate farmers on how to reduce risks associated with agriculture e.g. assess the farm to identify which areas are prone to flooding, ensure they have enough seeds or planting material, appropriate choice of crop for season, and planting trees and shrubs to protect crop and terrain.
- Pest and diseases and the relevant procedures and measures to be taken to avoid
- Establish a weather risk management facility. Historical information is key to the effective administration of such a facility. Farmers should keep good production records such that losses sustained due to unusual weather conditions can be properly assessed and the potential risk evaluated. Government could also provide the required time series weather data.

### *3. What are some of the external factors that introduce risk into farming?*

The main external factors that introduce risk into farming are climate change, which manifests as temperature changes and extreme weather patterns, and diseases which effect species and habitats along with farm outputs. Farm practices have to become adaptive to these changes whether through indoor farming, styles of beds or irrigations systems.

Migration: the absence of men on the farm is devastating leaving the vulnerable women to take care of the family with low income, working in extreme weather patterns, securing food and water. Diversity and innovated practices, in addition to intergeneration programmes may draw young men.

Financial stability: financial meltdown will affect livelihoods, prices policy for goods across the board will ensure that farmers will survive and discourages importation from extra-regional sources.

### *4. What kinds of risk insurance coverage do we need for our farmers?*

Depending on farm activity the insurance coverage will differ and coverage must be tailored to suit each individual farmer; however, in general, the priority for risk insurance coverage must be livestock and crop insurance for

natural disasters - parametric insurance for hurricanes, droughts, and floods. Secondary categories should include pest and disease outbreaks, property insurance (building, vehicle and equipment), and Praedial larceny; although, recognizing that there can be issues with the latter concerning credible evidence. We cannot neglect to consider the health of the farmers as well. It would be impossible to have a well organized thriving farm managed by an ailing farmer who is worried about finding money for medicals. Farmers should, therefore, also have health and life insurance.

We will need to consider how, when and at what premium. As well as taking into account the size of plot and the age of the farmers. Coverage must not be expensive but at the same time flexible and efficient for the farms and the insurance company. Further coverage should also be considered for areas such as: vehicles used for farming, machinery, fire (burning of crops and buildings), medical coverage for both the farm owner and workers (even death coverage to help family with expenses and to continue operations by hiring an employee), livestock (for theft, outbreak of disease).

Ideas for how the insurance premiums could be covered include using a system similar to that employed by the Coffee Board in Jamaica whereby a cess was collected from goods sold.

Livestock insurance could be calculated according to the value of the stock annually. Another thought is that crop insurance could be calculated according to the cost of production per acre plus an additional percentage (such as 10%) for contingencies and to reinvest in the next crop cycle, therefore, each crop would carry a different valuation.

Contract farming mechanisms warrant further consideration as they enable farmers to insure their crops easier. Such a mechanism would require a pilot approach to ensure sustainability and success. Farmers will want to see it work before decided to opt into crop insurance because it would be a new venture within the Caribbean. Through feedback obtained from farmers, it is evident that farmers have expressed interest in this approach provided rates are competitive. See Appendix II for further details on the types of agricultural insurance.

##### *5. What can we bring to the table to encourage partnership for insurance coverage?*

Farmers can carry to the table to encourage partnership for insurance coverage, Memorandum of Understanding, Contracts (if contract is time specific, insure for the duration of the contract plus 3 additional months), value increasing assets of cash flow worth, be customers for other types of insurance the company offers (life, health, personal property, vehicle, etc.)

At this time there are no insurance programmes for farmers in most countries in the Caribbean region; however, farmers would be willing to partner with the State for a comprehensive insurance programme whereby the farmers associations will assist in the verification process of bonafide farmers requesting insurance for crops of livestock. For all disasters, farmers can negotiate crop insurance with insurers by leveraging farm technology, recorded yields and sales receipts

##### *Floods*

- Sub-soil, deep plough to break up hard pans by tractor cultivation; Double digging by manual cultivation to break up hard pans.
- Mitigate effects by using plastic mulch
- Mitigate effects by growing crops that are water-tolerant e.g. tubers, rice
- Recover quickly by having seeds for short crops (lettuce, cumber, okra and beans) safely stored and planting material from germplasm banks available

##### *Droughts*

- Use water storage tanks and dams to store water for use during dry season
- Mitigate effects by growing varieties and crops that are drought-tolerant



#### *Pests/Disease Epidemics*

- Identify problems early by scouting regularly
- Mitigate by planting resistant varieties
- Recover quickly by having seeds for short crops (lettuce, cumber, okra and beans) safely stored and planting material from germplasm banks available
- Grow a variety of crops with unrelated pest/disease problems so that the chance of all failing simultaneously is low

#### *Bush Fires*

- Create planting barriers

#### *Landslides*

- Contour planting & terracing
- Planting deep rooted crops like fruit trees on slopes

### **FARMERS AND UNINSURABLE RISK**

#### *Mitigating Financing Risk*

'Credit Guarantee Scheme' could be a useful instrument that could enable resource poor farmers to access financing and provide financiers with an instrument in mitigating the financing risk inherent in agricultural production enterprises.

Access to finance is a key requirement for investment in improved technologies. An important factor which limits farmers and agro-processors ability to access financing even when they have good project is insufficient collateral.

The concept is for the establishment of a credit guarantee scheme with the banks which would allow the banks to evaluate and approve projects principally on the basis of the technical and financial feasibility rather than the amount of collateral available. The banks would however still rigorously evaluate projects and use collateral when available.

Under this arrangement a 'Credit Guarantee Fund Trust' can be established to facilitate flow of collateral free credit to eligible small scale farmers and agro-processors from formal banking sector.

This should preferably be a regional initiative and can be done in collaboration between the public and private sectors. Regional Governments can also approach one of the 'Friendly Countries' to provide the funding for the Credit Guarantee Fund.

Examples of successful use of these instruments can be found in India.

\*However we must note that in some countries like Trinidad and Tobago there is the American Development Bank that provides credit to farmers and exporters; however, the Governments of the Region must have the Political will to create the right environment for any Risk Financing Programme to succeed. We must make this point strongly

#### ***Agricultural Enterprise Investment Risks***

Agricultural enterprises are by their very nature high risk. To mitigate investment risk good information is critical. We need professionally prepared and annually updated enterprise budget models (to take into consideration changes in resource costs) to assist farmers in assessing the potential profitability of enterprises before they undertake the investment. Also require technology packages that are relevant to the environment that the farmer will be carrying out his enterprise. Consider suitability of land, available technology, access to water and other resources such as transportation, utilities etc., access to labor, pest control issues and availability of inputs etc., varieties to plant.

### **Market Risks**

Many of our farm enterprises are not aligned to market requirements. To mitigate this risk we need good market information (product required, when required, amounts, prices, trading terms etc. farmers will need to register their farms as a business, keep concise records and have strategic plans for the future to improve operations. Farms have to be more than substantial but profitable, securing markets for goods is crucial and constant studies have to be done for consumption changes, supplies, and seasonal request for goods. Contract Farming is a useful instrument for consideration.

### **Trade Related Risk**

Getting paid for produce sold can pose a serious problem for producers and exporters. Export Credit Scheme has been tried in some countries. Trade credit schemes may also be looked at.

### **TYPES OF AGRICULTURAL INSURANCE**

Source: Fraisse, C.W., Novak, J. L., Garcia, A., Jones, J.W., Brown, C., and Hoogenboom, G., 2005. *Using Crop Models and Climate Forecasts to Aid in Peanut Crop Insurance Decisions* [online]. Gainesville: University of Florida Cooperative Extension Service. Available from: <http://edis.ifas.ufl.edu/ae285> [Accessed: 13 June 2010].

### **Insurance Products for Yield and Price Risk Protection**

Current crop insurance options that are available for farmers fall into two broad categories: those that protect against yield loss only and those that protect against both yield loss and price risks. Yield loss protection includes Actual Production History (APH) and Group Risk (GRP) insurance products.

### **Actual Production History (APH)**

APH is designed to protect the individual farm unit against yield loss. Actual farm production history on a farm unit is used to set protection levels against yield loss due to extreme weather events, such as drought, excess moisture, cold, frost, wind, flood and other unavoidable damages from insects, diseases and other pests. The key word here is unavoidable losses. Farmers must take every precaution to avoid losses. For APH, yield protection levels range from 50% to 75% of APH (in 5% increments) depending on the crop and area where the farm is located. In some areas up to 85% APH yield protection is available.

Under APH, election prices are set each year by the federal government (USDA-RMA), based on marketing data available prior to sign-up, and are used to determine payments for eligible crop losses. In a way, farmers can set revenue protection levels by selecting from 55% to 100% of the established price and by varying yield coverage levels. In 2005, the peanut insurance price was set at \$376/ton (\$.188/lb).

Collecting payments on APH insurance depends directly on the level of insurance purchased and whether the peanut yield achieved falls below the yield guarantee level. Low yields are highly correlated with dry weather, especially in the absence of irrigation. In 2003, peanut producers insured their peanuts at the yield guarantee levels shown in Table 1. In Alabama and Florida, peanut producers tended to favour the purchase of 70% of APH, whereas in Georgia, they favoured 65% APH insurance.

APH is based on a minimum of 4 and a maximum of 10 years of an individual farm's yield production history. If less than 4 years of APH are available, the rules specify that county average transitional yields (T-yields) be used to fill in the missing years. T-Yields (generally 10-year county average yields) are substituted for the farm if one or more years of records are missing. The substitutions are made according to the following formula:

- 1 years missing – substitute 1 year @ 100% of T-Yield.
- 2 years missing – substitute 2 years @ 90% of T-Yield.
- 3 years missing – substitute 3 years @ 80% of T-Yield.
- 4 years missing – substitute 4 years @ 65% of T-Yield.

T-yields tend to represent area- or county-wide risk but not individual farm yield risk. There are cases where farmers can benefit from the use of T-yields, but they do not represent individual risks well unless the farm mirrors the county average. In case of catastrophic losses year after year, producers can replace any yield in their database with 60% of the county T-yield.

A premium is charged depending on the coverage level and type of insurance taken. Premiums are subsidized by the federal government, ranging from about 67% of the total premium at 50% yield coverage level to 38% at 85% yield coverage level.

#### ***Catastrophic Insurance Coverage (CAT), Group Risk Plan (GRP), and Revenue Insurance Products***

CAT is a cheap disaster insurance (there is an administrative fee of \$100 per crop) which provides coverage at 50% of APH yield level and 55% of the elected price.

GRP insurance is based on average county (or parish) historic yield and not on the yield history of the individual farm. This type of insurance is most useful for farms whose yield history tracks the county average yield or if there is a disaster that affects the entire county (parish). GRP is generally cheaper but does not offer the individual farm protection level provided by APH.

Several insurance products are available to protect against both price and yield risk. These include such products as Crop Revenue Coverage (CRC), Revenue Assurance, and Income Protection. While revenue insurance products such as CRC are rapidly becoming popular, they are not yet available for peanut producers.

### **SUMMARY OF RISKS FACED BY FARMERS AND SWOT ANALYSIS OF PRESENT SITUATION**

#### *Economic Risks*

- Trade Policies
- Market Entry
- Credit/financing Availability
- Transportation – air/sea

#### *Environmental Risks*

- Weather (Hurricanes, droughts, floods)
- Pest & Disease outbreaks
- MRL's
- Invasive species
- Proliferating Standards

#### *Political Risks*

- Investment Incentives
- Regional collaborative action
- Support Facilities for agriculture

#### *Societal Risks*

- Praedial Larceny
- Labour Laws
- Product Liability

#### *Technological Risks*

- Pest Management
- Investment in R&D
- Availability of Information
- Competitive technologies

## ***SWOT Analysis for Caribbean Farmers***

### Strengths

- Technical support from Government
- Eco-climate suitable for growing a wide variety of crops and rearing livestock;
- Cost advantage
- Small scale farming (quick response to disasters).

### Weaknesses

- Ineffective research in new product development to address industry-wide challenges;
- Poor farm infrastructure
- Low literacy levels
- Lack of technology
- Poor access to buyers
- Low customer retention
- Sub-scale
- Management
- Absence of important skills and human resources (especially youths)
- Lack of expansion space
- Lack of patent protection
- High production cost

### Opportunities

- Changing customers tastes
- Technological advances
- New distribution channels
- Fulfilling customers needs
- Removal of regional and international trade barriers.

### Threats

- Increased frequency in extreme climatic conditions such as hurricanes and tropical storms and subsequent flooding; and,
- High prevalence of praedial larceny.
- Closing of geographical markets
- Technological advances
- New distribution channels
- Arrival of competitors with similar activities
- Economic instability
- Lack of product innovation and supplying demands.
- Emergence of substitute products
- New regulations
- Increased trade barriers

**DISASTER RISK MANAGEMENT STRATEGIES IN AGRIBUSINESS –  
SOME FULLY INSURED COMMERCIAL ACTIVITIES**  
DR. KEITH AMIEL  
PRESIDENT, CARIBBEAN AGRIBUSINESS ASSOCIATION (CABA)

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**Agri-business clusters will attempt Vertical Integration.**

**Integrated elements will include Agencies facilitating:**

- Financing
- Research and development of appropriate technology
- Propagation and growth of the particular product
- Differentiation and processing into value added variants
- Branding and securing finished presentations by invoking intellectual property rights
- Formalizing channels of distribution
- Capturing global market share
- Supporting what we sell with promotions and enlightened customer service.

Some Sustainable Agribusiness Clusters - In Various Stages of Development:

**Examples of Clusters:**

**Pork Cluster:** pork remains the number one meat eaten worldwide

**The Livestock Clusters:**

The Poultry industry provides the region's main protein source and effectively achieves import substitution for both broiler meat and eggs. The advanced technology used is effectively transferred to cottage producers through the provision of essential inputs that enables them to perform at a profitable level. Many of the essential elements rely heavily on imports.

**Small Ruminants**

Tropical varieties of sheep and goats abound. They can appropriately be bred in the smaller territories for they have the capacity to flourish on home grown forage, producing both meat and milk. The twelve month growing season and carrying capacities can be considerably improved with appropriate forage and conservation systems. Investments in core breeding facilities will be necessary.

**Large Ruminant Production**

The breeding work has already been done through the Tropical Adaptation and research and development work lead by Dr Lecky. The larger plantations, that now do sugar or bananas only, must again be directed to diversify into these areas, as waste products from these operations can be converted to animal protein. Lands currently held that are not suitable for crops can be developed into grasslands using equipment and the technical staff already on the ground.

Contracts with the multinational mining companies, particularly bauxite, must be renegotiated. They cannot be allowed to keep so much of our limited land space in ruminates. It must be brought back into full production post mining. Displaced workers must be factored into the reclamation process.

Cattle produced here will play a major part in import substitution of beef and milk while creating employment.

**Tilapia and Shrimps**

The region should capitalize on its strategic advantage as these warm water creatures do not do well in temperate climates. Hence they present an opportunity for export industries as well as one to compensate for over fished surrounding oceans.

### **The Condiments**

Spices represent the flagship industry of Caribbean Cuisine. It is limited by shortages and an unknown capacity to produce. Horizontal linkages within CARICOM will be necessary to sustain the brands. Strategically placed processing plants for custom packaging will be necessary.

### **Non Traditional Fruits and Vegetables**

There is a need to allocate land for orchards and large scale production. Domestic Science research labs will be essential to differentiate products and to work on limitations of shelf life. Factories will be necessary to take off surpluses and convert them to dried and canned products as well as to capture the flavors of the Caribbean.

### **Root Crops**

Returns from exports were greater than bananas last year in Jamaica. Very significant expansion is possible. Differentiation into products such as ready to eat chips, flour and breakfast cereals could prove very significant to rural communities. Marginal lands could be put to good use.

### **Nutraceutical, Pharmaceutical and Cosmeceutical Products**

The region is rich in hundreds of plants that could form the base of this industry. Because of the initial experimental nature of developing and extracting active ingredients significant grant funding will be necessary to get many of these projects off the ground. State of the art laboratory facilities will be necessary to facilitate toxicology studies and to declare the products safe for use.

### **Renewable energy Activities**

Tropical ornamental plants and shrubs abound. Forestation with useful timber is an imperative to protect water tables and minimize erosion. A Caribbean furniture industry is needed to facilitate the décor of our homes and significant buildings.

### **Honey Production**

Bee keeping would complement the plant based industries as they would provide a pollination function as well. Varieties of trees such as logwood, previously a source of dyes for export, produce some of the highest quality honey that rivals Blue Mountain Coffee prices on the world market. Honey could also play a role in stabilizing rural development.

### **Sea Island Cotton**

There is a large niche market for this product. Its propagation rivals sugar cane in terms of land and labor required. Indeed, few CARICOM countries would be able to mobilize the labor required to ensure large scale production. In spite of the glowing terms in which proponents describe the fiber, the massive Chinese takeover of the cloth and garment industry requires that we proceed with some caution.

In the reorganized agricultural sector the commodity groups are organized vertically across the horizontal functional groups. This is aptly illustrated in the red column where the small ruminants' commodity grouping vertically integrates with the Industry Clusters.

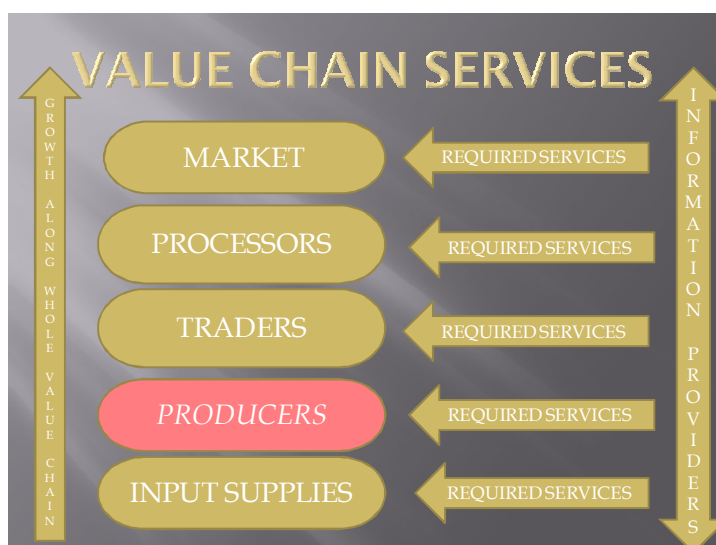
Note that each cluster includes all the functional groups that have an interest in that commodity, i.e. the planners, producers, researchers input & service providers etc. The VICICs (Vertically Integrated Commodity Industry Clusters), therefore have the full complement of resource persons who can collaborate and strategically plan the development of an industry based on a particular commodity.

**VICICs are the quintessential building blocks for the development of the unified and organized agricultural sector that will drive the development of an aggressive and proactive agricultural sector.** Because the VICICs have representation from the full gamut of interest groups constraints, challenges and opportunities can be approached in a holistic and all inclusive way fostering solutions geared towards a “win-win” situation due to a better understanding of how the fragments come together to make up the whole, and the interrelationships

between the various stake holders. This will facilitate the strategic planning for a synchronized development of the industry. VICICs will allow for the quick response to changing market trends and opportunities.

Note that the VICICs do not negate the formation of the horizontal functional groups which form across the clusters. This is good because it will minimize the duplication of effort in some cases and present for synergistic situations in other cases where VICICs share similarities. Of equal significance is that national VICICs can give rise to regional VICICs which can foster the development of regional industries and the sharing of knowledge at the regional level. The horizontal functional groups can also be migrated regionally, also allowing the collaborative effort that yields synergies to the benefit of the regions agricultural sector.

**Small Producers/Farmers – “Jack of All Trades” -doing everything oneself, puts the system at risk. When he is down or creates a shortfall the whole system goes down. Hence a poor investment and insurance risk**



#### Small Ruminant Production as an example of how the Cluster works

- Tropical varieties of sheep and goats abound. They can appropriately be bred in all CARICOM territories. Only 30% consumption being produced.
- They have the capacity to flourish on home grown tropical forage, producing both meat and milk
- Even with our twelve month growing seasons, carrying capacities can be improved considerably with appropriate forage conservation systems that are adaptable to the CARICOM territories.
- However, Investments in ‘core breeding facilities’ will be necessary to multiply the breeding stock available - as we have done for the Pork Industry.

**Determinants of Demand are Market Driven - not Supply Driven:** because the system is market driven, it will not be limited by producer; if the farmers fail to produce they are horizontal alternatives in place.

- Subsistence Farmers and Fragmented Small Producers justify a Supply Chain based on their peculiar circumstances
- These include immediate family needs, labor and money availability, climatic factors and perceived local markets
- These are invariably out of synchronization with National and International requirements and influences
- Consequently Agribusinesses, in concert with the Relevant Authorities, have had to take corrective actions so that demand of the local population, the tourist Industry and Foreign Trade can be met.
- Goods and services are moved horizontally within the region (if phyto sanitary blocks ant Tran border trade will allow). Simultaneously imports of raw materials are facilitated under a Permit Regime to safeguard local suppliers.

- The vagaries of hurricanes and the presence of invasive species on their own will not prove sufficient to halt the vertically integrated agribusiness cycle
- Therefore investments in the agribusiness process and insurance coverage will not be thwarted. The arrangements for continuity will make the risk level acceptable.

**Building the Poultry and Pig Industry Physical Facilities to survive Hurricanes - thereby rendering them and their contents fully Insurable**

- The Poultry Industry provides the region's main protein source and effectively achieves import substitution for both broiler meat and eggs.
- The advanced technology used is effectively transferred to cottage producers through the provision of essential inputs that enable them to perform at a profitable level
- The core physical facilities are built to survive environmental challenges.

**Poultry Houses Produce Through Hurricanes in excess of 110 mph**

- Buildings are designed for the Caribbean Climate with the following specifications
- Open web steel truss frames 10' apart are designed with the load carrying capacity for a building 40' 3" x 400' x 7' 8" leg height.
- Wall: wind 110 mph Zone
- Roof: Live: 16.5 lbs per square feet
  - Dead: 5lbs per square foot
  - Wind: 110 mph Zone

The building provides an environmentally controlled space that can be cooled and operated by remote control.

**Food Production and Security need not be at High Risk**

- Hence Agribusiness supersedes Agriculture in a new paradigm.
- A multiplier effect is thereby created.
- This brings with it wider markets and corresponding sustainability.
- It also brings with it a wider variety of jobs and higher incomes that may yet make agriculture a major contributor to the Gross Domestic Product while creating a new range of vocations for our populations.



## **GREENHOUSE PRODUCTION “GOOD METHOD OR BAD BUSINESS?”**

DR. KEITH AMIEL

PRESIDENT, CARIBBEAN AGRIBUSINESS ASSOCIATION (CABA)

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### **BACKGROUND**

- In response to past Hurricanes protected agriculture has evolved.
- More than 70 % of farms were damaged or destroyed
- Most of us within the industry have a pretty good idea that these systems of growing plants have helped to reduce many problems experienced in conventional crop cultivation.
- Protected agriculture now offers optimal conditions for plant growth and therefore, higher yields are being obtained compared to other areas of agriculture.

### **GREEN HOUSE FARMERS IMPLEMENTING DISASTER RISK MANAGEMENT.**

- Greenhouse is a form of protected agriculture proven to increase the certainty of food production, despite adverse weather conditions, while providing viable alternative livelihood opportunities for rural communities.
- A greenhouse is a building where plants are grown. It protects crops from too much heat or cold, shields plants from storms and helps to keep out pests.
- The facility requires minimal land space and allows many crops to grow in a controlled environment all year long.

### **STRATEGIC GREEN HOUSE FARMING**

- The Greenhouse Agribusiness Association in Jamaica (JGGA) has over 100 members. The most common greenhouse crops they grow include tomato, cucumber, pepper, eggplant, lettuce, melons, strawberry and snow pea (sugar Pea).
- Both drip and overhead irrigation systems are used, the plants being fed with necessary nutrients in a soluble form.
- Hydroponics, a variation that excludes traditional soil and is based on water permeating through trays and specially designed drums, is also effectively practiced in a controlled environment protected in weather proof structures.

### **DISMANTLING AND STORAGE OF EQUIPMENT IN HURRICANES AND OTHER ADVERSE WEATHER CONDITIONS**

- There are expensive green houses, similar to those used in poultry production that can withstand 110 mile per hour winds. They work well but the initial capital expenditure is high. They are suitable for large scale production.
- Houses of up to 6000 sq. ft. can be made with a frame of 2” -4” piping material and angle iron. Alternatively treated (WPP) lumber 4” x4” for the uprights linked by 1” x 3” strips can form the framework over which netting is stretched. As these are screwed together they can easily be dismantled and stacked in a pending hurricane.

### **CREATION OF EARLY AND LATE MATURING VARIETIES COULD BETTER SUSTAIN THE FOOD CHAIN**

- Our 365 day a year growing season gives us a strategic advantage over temperate countries.
- The latter have had to produce growth to maturity within 7 months because of the vagaries of winter.
- We need to contemplate the Hurricane season in a similar manner to which the temperate countries contemplate winter. We would produce surpluses outside of this period that would go into storage in the most difficult weather periods and feed into processing plants as part of the new product differentiation strategies.

## **CONCLUSION**

- Protected agriculture has influenced a management and labor strategy that:
  - Encourages the development of private producers, encourages farmers to work smarter, and more efficiently. Above all it will make production more predictable and sustainable under potentially difficult environmental conditions
- Encourages farms to optimize the use of hired labour, using fewer people to produce more, thereby improving productivity and enhancing the prospects of increased profitability.
- Encourages the learning of new technologies required to produce and market new products.
- Protected agriculture has also allowed farmers to produce at lower costs and much better and consistent quality.

## **FOOD PRODUCTION AND SECURITY NEED NOT BE AT HIGH RISK**

- Hence Agribusiness supersedes Agriculture in a new paradigm.
- A multiplier effect is thereby created.
- This brings with it wider markets and corresponding sustainability.
- It also brings with it a wider variety of jobs and higher incomes that may yet make agriculture a major contributor to the Gross Domestic Product while creating a new range of vocations for our populations.

## FACILITATED PLENARY DISCUSSION

Panel: Messrs. Cavell Francis and Leonardo Biagi, OXFAM; Messrs. Jethro Green and Keeley Holder, CAFAN

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### Questions/Interventions:

#### Minister of Agriculture, Dominica:

Presentations were practical and very informative. He is committed to being a partner in the implementation process. He does not expect this symposium to be an exercise in futility but that practical solutions found and the needs and areas of mitigation be identified for risks associated with natural disasters and most workable solutions to achieve this. Prerequisites are fertilizers and feeds; these may be observed as additional risks since increasing cost for these will cause serious problems. With respect to the high costs of fertilizers and feed what can be done on at a Regional level to ensure that we are not affected by this since this can affect the production and productivity in the Region.

#### Agricultural Society (Barbados)

How capital investments from the governments can affect the risks?

Systems are already in place and there is need for these to be more streamlined for assistance in times of disaster.

There is the need to take an inventory what is presented and use existing strategies already present. The lack of insurance may be due to farmers being treated as subsistence farmers and not as serious businesses with no legislations ensuring that certain parameters are in place before farms are established for e.g. the need for insurance.

#### Elibazeth Riley - CDEMA

There is the need for this meeting to reach to certain decisions today with respect to the need for Agricultural insurance. Issues being raised are broader than this. There is need for CAFAN to share on the specific areas where the interventions from the partners are needed.

### Panel Response:

#### CAFAN (Jethro Green):

An Agricultural Risk Management Protocol is needed consisting of:

- Agricultural insurance
- Public and Private Sector partnership
- Use of present insurance products which are available and improve on these
- Look for capacity building in farmer organisation
- Need to work in groups – clustering and associations with the Ministries of Agriculture

#### CAFAN (Keeley Holder) Re: Fertilizer and Feed price increases

Year round landscaping occurs and with this a recycling centre may be established where waste vegetable matter is used for composting. If done, this can account for some of the reduction in fertilizer purchasing. Purchasing in bulk can also help in reducing the cost. Proper balance in soil nutrition planning can also reduce the amount of fertilizer required. Soil testing etc., important since the tendency is to use fertilizer when it is not necessary. There is need to maximize these different measures to reduce high costs in fertilizers. Feeds are natural foods for feeding animal seek viable options scientifically approved to reduce costs.

### Question:

**NDF (National Development Fund - Antigua):** Micro Finance Institution (MFI) suffers the greatest. The MFI work with farms and give loans but usually suffer the greatest in face of disasters. Perhaps part of package in payment for loans should be insurance coverage.

Regarding the OXFAM presentation agricultural insurance to protect vulnerable females and their issues should be considered. In the survey what was the view point of the women as they are the high risk group?

**Response by Cavell Francis (OXFAM):**

Of the 14 farmers interviewed 6 were women; all indicated similar needs most were skeptical re: participation of government...a lack of trust. More gender related questions may have been asked if time had permitted. Agreement: need to have Regional Agriculture insurance scheme also national legislative backing for this scheme, development risk profile, target beneficiary, financial analysis, cultural effort, efficient warning systems.

**Crop Credit Union (St. Kitts & Nevis):**

In Disaster Risk Management the following are of importance:

- Source of finance players very much involved
- Risks of high investments
- Risk of failures due to the fact that the Region is involved
- Governments give subsidies
- Government & funding organisations come together to provide funds
- Associations and farmer's cooperatives resources are being pooled
- IICA and Government Social Security Board involved

Need to find out if there is a difficulty to amass the funds. There is also the need for a structural approach at the Regional and National level for timely production and a buffer in risk management in the face of disaster.

**Agricultural Society (Barbados):** Families work together in this society; women are not taken advantage of in the agricultural industry. How can persons in Agriculture get resources to effect technology reforms on the farm? This will help to reduce the risk.

**Grenada NEFO (farmer's org.):**

Great risks – youth needed to eventually replace vibrant high ranking persons so the efforts in risk management and the development of the agriculture industry will continue. Risk to the producer is lost.

**CARICOM**

To date the seriousness of most farmers is not observed. A common position is needed by the Region.

**A. Glean- TTABA (Trinidad)**

Insurance programmes are not all a success. Risk management systems are being researched and developed on green house systems. Partnership is seen as a need. Trust and need to work together for the support of the local producer is the way to go. Encourage buyers to buy within the region.

**Panel Response:**

**Jethro Green- CAFAN**

The association is made up of farmers not dependant on funding agencies. Young persons are being identified to continue in the natural succession of leadership.

**Dr. Amiel – CABA**

Farmers in the poultry and pig farming get paid and are ones that show Agriculture as being a successful business. This is because the accounting is precise for poultry farming and pig farming ...the production cycle is precise hence the possibility of regularized payments. Tariffs are included on these products to safe guard these industries. There is the need to safe guard the region against the dumping of chicken necks and backs in this Region from the US and other regions.

**OXFAM:**

Comment on Gender - Not hitting the issue of men against women but that of gender inequalities which are present in times of risks. It is known that the effects of risk will affect men and women differently. Genders in equalities occur within the Caribbean and Latin American. Caribbean has made significant strides in gender inequalities.

**Senator Norman Grant (Jamaica Agricultural Society):**

This workshop is very timely. Four important areas identified:-

We cannot go forward without a meaningful frame work for agriculture insurance. It can be tackled by country to country basis or a regional approach.

Regional governments have to agree to focus on the product and develop a policy considering the risk factors. The Ministry needs to revisit the Jagdeo Initiative to the identification of financial resources to get this going. All multinationals find a way to come together so as to help collectively instead of individual. Grant proposed that agricultural insurance be a mandatory part of the farming system, particularly for commercial farmers. Farmers are businessmen and one aspect of the value chain and will continue to do what they have been doing. Banks need to come to the farmers with the loan tied with insurance coverage. A legal framework is necessary before this can be addressed.

Compulsory insurance schemes can work as was evident with the coffee farmers in Jamaica. In this scheme there was a regulatory body overseeing the payment off the premiums.

Types of crops: coffee and banana.

Where premiums are two high Government and Farmer groups should step in.

What is the rate of contribution from coffee premium – (2-3% of the revenue, 1 USD per box of 10 lbs of coffee)? . The buyer is required to take money to the insurer this is collected at the point of sale. The value is estimated at 25 million USD. After 14 years this system failed as a result of the system moving from a compulsory system of payment to a voluntary one.

**Response - WINCROP**

At the delivery of bananas there is the deduction of the premium from the sales and a cheque is sent by the banana companies.

**Question/Intervention: WinFresh – E. Barrett**

Any idea how small producers e.g. vegetable crops will be incorporated?

Success factor is determining a common point where premium can be collected. This is not there for small producers. This will be needed before it is resolved. Government should introduce a special mechanism e.g. CAFAN and other groups. Registered farmers need to ascertain estimated value for their crops and production yields.

There is need for fiscal data of each season and a projection on the expected production values.

**Question/Intervention: Daniel Lewis (Grenada)**

Given the risks attributed to the stealing of crop produce has there been any consideration of this in the strategy.

**Question/Intervention: Junior Minister of Agriculture**

What mitigation factors for Agro insurance and the benefit to farmers?

Interregional trade shipment routes seem to be a specifically mapped out route which usually is the most costly one.

**Question/Intervention: Agricultural Society Jamaica**

Collection of premiums to be no different than that for coffee

**Panel Response – CAFAN**

Where insurance is expensive there is need to look at schemes where 55% of stock can be insured. Use of Best Management Practices offered to Pilot insurance schemes

The model in St. Lucia should be examined for its successes. Crop theft is to be addressed

**Response - Cavell Francis**

Crop theft is a crime and the Ministry of Agriculture along with Ministry for National Security need to work together to resolve this crime.

**SESSION 8:**  
***Towards a Regional Risk Management Strategy***

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Chair: Hon. Hilson Baptiste  
Minister of Agriculture, Lands, Housing and the Environment

**Outline of the presentation**

- Insurance and agricultural risk management
- The Spanish Agricultural Insurance Scheme
- Economic aspects of agricultural insurance schemes
- The lessons learnt with agricultural insurance
- Caribbean Regional Agricultural Insurance Scheme Proposal
- Conclusions

**INSURANCE AND AGRICULTURAL RISK MANAGEMENT**

**Available instruments for coping with risk in agriculture**

|                                      |                                      | “ex-ante” tools   | “ex-post” tools                         |
|--------------------------------------|--------------------------------------|---|---|
| Risk reduction (on-farm instruments) |                                      | Gathering information<br>Reduction of risk exposure<br>Diversification of production<br>Flexibility<br>Self-insurance or individual funds |   |
|                                      | Risk transfer (off-farm instruments) | Agricultural insurances<br>Catastrophe bonds (“Cat bonds”)<br>Weather derivatives<br>Future markets                                       |   |
|                                      | Market instruments                   |   |   |
|                                      | Non-market instruments               | Public activities in agricultural mitigation and adaptation<br>Mutual funds<br>Natural disasters funds and other public instruments       | Humanitarian aids<br>Ad-hoc public aids |

01/10/2010

Risk management as a pillar for agricultural development based on experiences in Spain

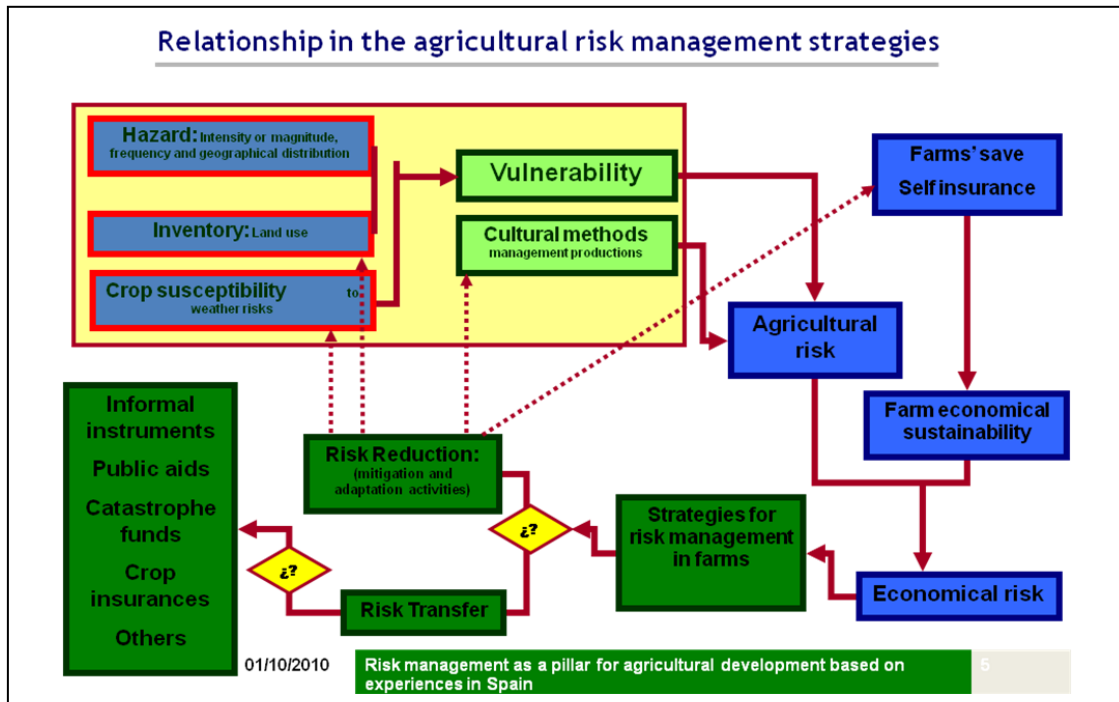
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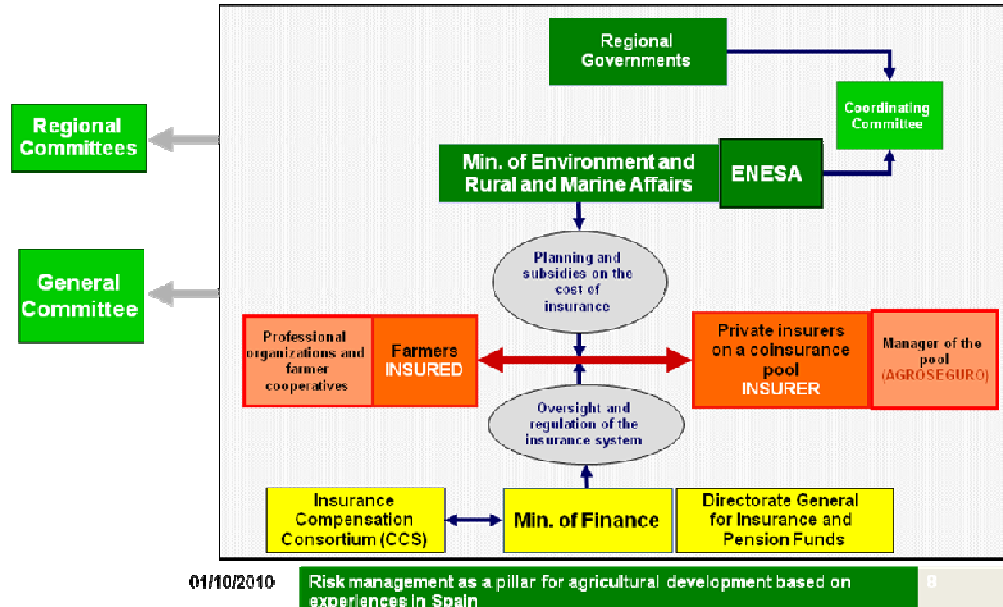
## THE SPANISH AGRICULTURAL INSURANCE SCHEME

### The pillars of Spanish Agricultural Insurance Scheme

- Its universality and it favours dispersion of the risks and promotes compensation of its results
- The participation of farmers' organisation
- Management by private insurance companies, which operate as a coinsurance pool and the guarantee of reinsurance
- Public support of the system



## Institutions involved in the Spanish agricultural insurance scheme



### Mixed public / private system (1)

#### → Involvement of the Administration in the system:

- Planning agricultural insurance policy and financially supporting farmers, when they take out policies
- Responsibility for the oversight and monitoring of the system

### Mixed public / private system (2)

#### → Managed by private insurance companies, which:

- Participate, grouped on a coinsurance basis (in a pool called AGROSEGURO), in the coverage of all insurable risks
- Establishing insurance conditions and rates, common to all insurers in the pool and specific to each insurable commodity for each area
- Controlling the insurance policy transaction carried out by insurance companies, assess losses and pay out indemnities

### Crop and livestock farmers' organisations have a major role in the system's development. For farmers:

- Insurance taking out is voluntary, but it must cover all the sites (or all the animals) of the same crop type that they farm in the country
- There are public subsidies on the insurance policy premiums

### Insurable risks

#### → Risks in crop production

- Coverage of damage caused by phenomena such as frost, hail, floods, fire, rain, wind or other adverse weather events
- Coverage of yield loss due to any natural risk not controllable by the producer

#### → Risks in livestock production

- Accident or disease: death or compulsory slaughter due to accidental events
- Epizootic diseases: death, compulsory slaughter or immobilization of animals due to foot and mouth disease, pleuropneumonia, classic swine fever, tuberculosis, brucellosis, BSE, avian flu and others
- Removal and destruction of dead animals on farms

**Insurable productions**

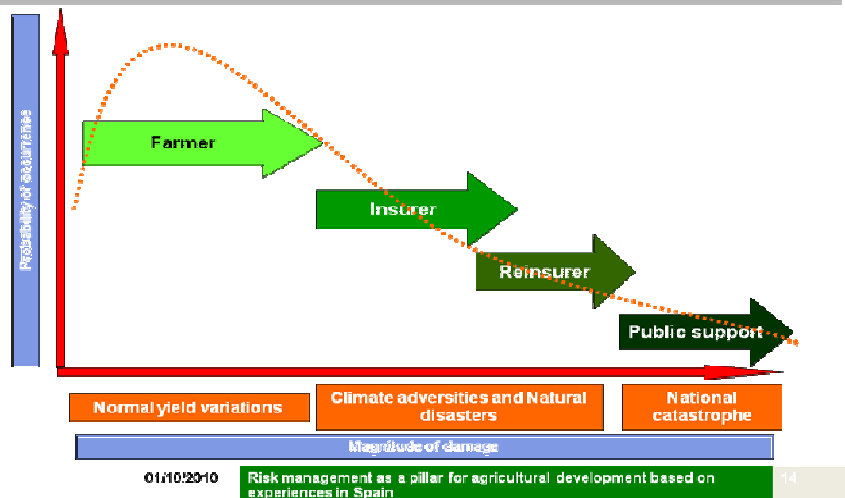
→ **Insurable productions:**

- All crop productions
- The main livestock species
- Fish farming species
- Some forest productions (cork oak, coniferous tree and farming land reforestation)

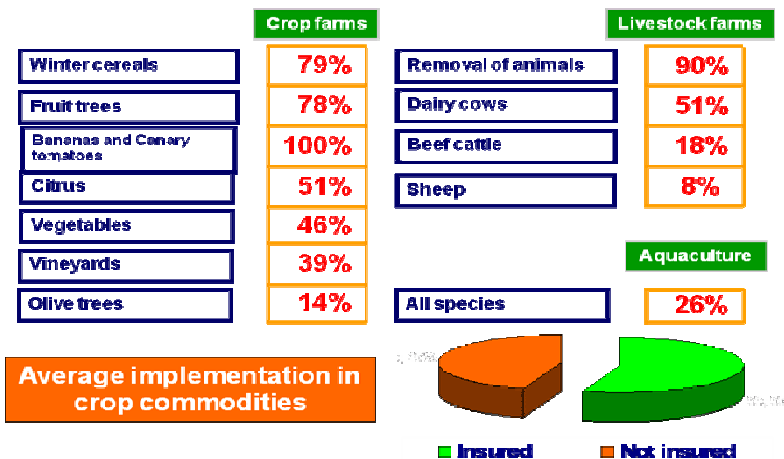
**Factors to the success of the system**

- Political and institutional commitment to promoting insurance as an instrument to cope catastrophic risks
- Specific and stable legal framework
- Participation of public institutions in technical studies
- Consensus to resolve the “traditional” problems of agricultural insurance
- Limitation of the loss to be borne by the insurers
- Progressive implementation of the system

**Distribution of coverage among the Spanish risk management stakeholders**



**Current implementation of insurance**



## MAIN RESULTS OF INSURANCE IN SPAIN for 2009

- ➔ 481,600 participating farmers with a Value of insurance of 10,677 million Euros
- ➔ More than 710 million Euros in premiums, which 262 million Euros are ENESA subsidies from 5.79 million hectares and 268.69 million animals insured

## GUIDELINES FOR THE FUTURE DEVELOPMENT

- ➔ To achieve universal protection in agricultural sector
- ➔ Improve the quality of the service received by the insured farmer
- ➔ To advance in the design of new risk management models
- ➔ Assist farmers in adapting to consequences of climate change

## ECONOMIC ASPECTS OF AGRICULTURAL INSURANCE SCHEMES

### Sustainability in different insurance models

According to Hazell's criteria, an insurance system can be considered sustainable in time if it provides:

$$(A + I) / P < 1$$

A - Administration and management costs of the insurance system.

I - Indemnity paid.

P - Total premiums received

| Country     | Insurer | Period analysed | Results |      |         |
|-------------|---------|-----------------|---------|------|---------|
|             |         |                 | I/P     | A/P  | (A+I)/P |
| Brazil      | PROAGRO | 1975/1981       | 4.29    | 0.28 | 4.57    |
| Costa Rica  | INS     | 1970/1989       | 2.26    | 0.54 | 2.80    |
| Japan       |         | 1947/1977       | 1.48    | 1.17 | 2.60    |
|             |         | 1985/1980       | 0.99    | 3.57 | 4.56    |
| Mexico      | ANAGSA  | 1980/1989       | 3.18    | 0.47 | 3.65    |
| Philippines | PCIC    | 1981/1989       | 3.94    | 1.80 | 5.74    |
| USA         | FCIC    | 1980/1989       | 1.87    | 0.55 | 2.42    |

Source: Hazell (1992)

| Country | Period analysed | Results |      |         |
|---------|-----------------|---------|------|---------|
|         |                 | I/P     | A/P  | (A+I)/P |
| USA     | 1999            | 2.71    | 0.96 | 3.68    |

Source: Skyes (2000)

| Country | Period analysed | Results |      |         |
|---------|-----------------|---------|------|---------|
|         |                 | I/P     | A/P  | (A+I)/P |
| Spain   | 1980/2002 (1)   | 0.82    | 0.18 | 1.00    |
|         | 1990/2009 (2)   | 0.68    | 0.15 | 0.83    |

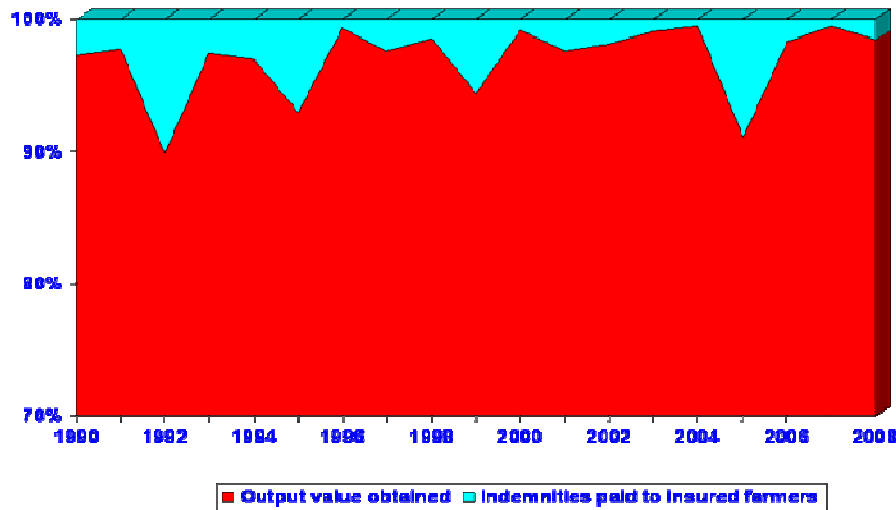
Source: (1) ENESA (2004)  
(2) Compiled by author

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Risk management as a pillar for agricultural development based on experiences in Spain

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Percentage distribution between market value and insurance indemnity of annual income of the winter cereals sector in Spain

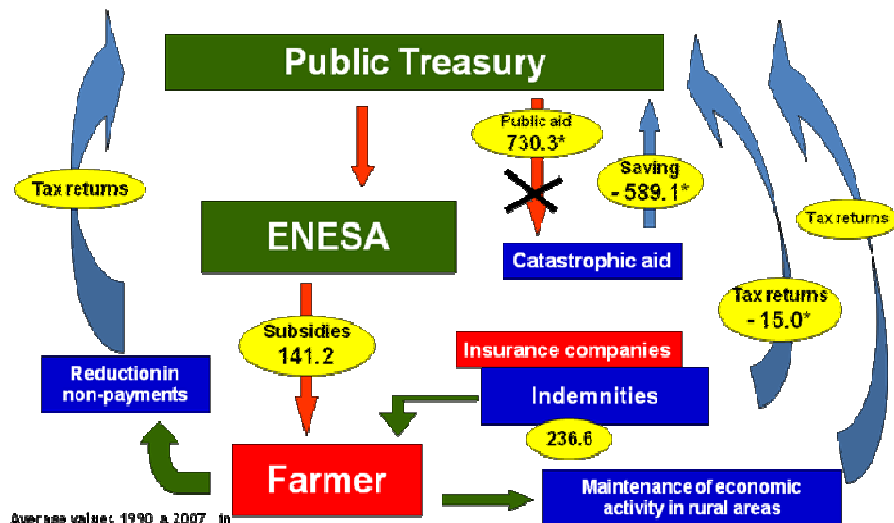


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Financial flows generated by the agricultural insurance system



Average values: 1990 & 2007, in million euros

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Risk management as a pillar for agricultural development based on experiences in Spain

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## THE LESSONS LEARNT WITH AGRICULTURAL INSURANCE

### Benefits of insurance when it is available:

- Farmers can reduce their risk exposure. Farm income flow is stabilized.
- Wealth creation is promoted. Farmers do not need to assign too much resource to cover risk.
- An automatic mechanism is provided for offsetting catastrophic damage. The public administration no longer needs to provide extraordinary aids.

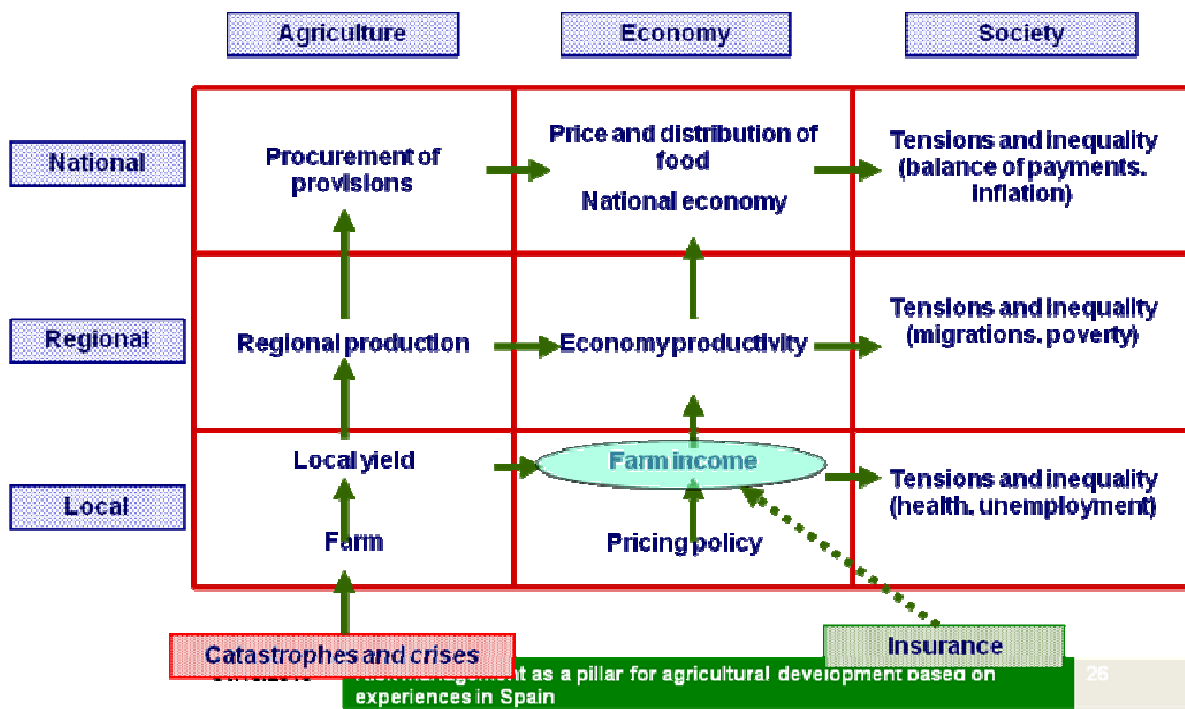
### Insurance developed jointly by private and public institutions provides an effective response to the agricultural sector, but:

- The functions and responsibilities of private and public institutions must be clearly defined.
- Farmer's associations must participate in the definition and application of insurance.
- Insurance must be covered by a specific legal framework, to allow a stable development.

### Insurance is a proven instrument:

- Able to maintain farmer's income
- Able to limit the economic impact resulting from natural disasters
- Able to be introduced and developed in all countries and for all farming types
- Provide to the Administration with a suitable tool for promoting other agricultural policies.

## The insurance as a proven instrument able to limit the impact resulting from catastrophes and crises



## CARIBBEAN REGIONAL AGRICULTURAL INSURANCE SCHEME PROPOSAL

### How it works?

- Farmers are categorised into Large , Medium and Small Sized
  - the farmers have to be registered with the government and would have provided regular production data figures
- The Small Sized Farmers when affected by disaster can apply to the National Government’s “Disaster Coverage Public Programme”:
  - this National Government’s “Disaster Coverage Public Programme” is supported by the “Agricultural Disaster Insurance System”
  - the “Agricultural Disaster Insurance System” is in turn supported by International Re-insurance
- Both the Medium and Small Sized Farmers are given two options (only one option allowed at a time).
  - The first option is the same as that of the Small Farmers, that is, they can apply to the National Governments “Disaster Coverage Public Programme” for disaster coverage.
  - The second option is to purchase polices from Private Insurance Companies. These Private Insurance Companies are also supported by International Reinsurance.

### Actions to be promoted by National Institutions to improve Risk Management & Insurance Development

#### Goals:

- Improving Knowledge of the threats that affect the agricultural sector.
  - Actions to be promoted
    - Promote technical studies.
    - Risk mapping.
- Improving the capacity / ability of producers/farmers in the management of risks.
  - Actions to be promoted
    - Development of the use of Risk Diversification Strategies.
    - Increased training of farmers in the use of Management Tools.
- Increased confidence of the insurance & re-insurance companies in the Development of Agricultural Insurance.
  - Actions to be promoted
    - Technical Studies of practicability.
    - Establishing a collaborative environment between private and public entities, for information exchange, improve training in Agricultural Risk Management & Cooperation for the development of the Insurance.
    - Definition of a stable regulatory framework.
    - Adoption of measures for the promotion of insurance by the public administration.

#### Agricultural insurance in the context of climate change:

- Insurance is, probably, the most efficient economical instrument for facing weather losses, at farmer level.
- Insurance should be included as soon as possible in the mitigation and adaptation framework, because a certain time is needed in order for a system to become satisfactorily established.

#### Guidelines for the future development

- ➔ Increase in the coverage offered by risk management systems
- ➔ Reduction in the costs and simplification of the management models
- ➔ Incorporation of new technologies and increase in the range of available managements models
- ➔ Greater prominence of “3P” strategies (private / public / partnership)

## CONCLUSIONS

- ➔ Do not expect more from insurance than it can provide. There are no “panaceas”.
- ➔ There are significant limitations in private and public systems. Opportunities lie in mixed “private-public” models.
- ➔ Insurance is an instrument capable of helping maintain income of farmers.
- ➔ There are more possibilities of success with systems designed with the participation of all stakeholders and complying with each country’s terms and potentials.
- ➔ Insurance is capable of responding to expected changes in agriculture and the rise of new uncertainties.
- ➔ The result of own experiences should be the starting point for improving insurance. Implementation of insurance requires continued work in time.



## FACILITATED PLENARY DISCUSSION

Panel: Minister of Agriculture (Antigua) and Mr. David C. Hatch - IICA

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### **Caribbean Network of Fisherfolk (CNF) /Antigua Fisherfolk Association**

Concerns expressed by CNF on the limited attention given to the Fishing Industry including Boats and gear in the discussions. This is also important for food security. It has not been found that insurance companies offer insurance for fisher gear and workers compensation. Like WINCROP there is need for regional insurance to cover fisher folk in the fishing industry. Additionally piracy is seriously affecting the industry throughout the region.

**Panel Response - Mr. David Hatch** - Insurance companies will not take on risks without making money. Size of potential market is assessed first. Best way is to use your own risk management strategies/techniques.

Moral management – policy can deceive insurance companies in order to make it a profit making venture instead of relief in times of disaster.

Fisheries, livestock and forestry have agricultural related risks but are all different and separate. The projected prices will differ in time a holistic product may be developed but this will take time.

### **Response – State Insurance Co. – Antiguan State owned Insurance Company**

Marine Insurance is a product which is offered and so too is Worker’s compensation.

### **Question/Intervention**

Where do we start and what sector is the next one to be addressed? It appears the process will begin with crops and based on importance of the other sector then it will be selected.

### **Response – Minister of Agriculture – Antigua**

There is the need for business operators to register their businesses and pay relevant taxes; worker’s compensation is offered to established/registered companies.

### **Response – Mr. David Hatch**

It is very important that product development is considered. Outside full time experts needed to evaluate the demand. The process can take 2- 3 years. Answers are there and best management practices can be used.

**SESSIONS 9 & 10:**  
***Government Response and Commitments:***  
***Where do we go from here and how?***

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Chair: Hon. Hilson Baptiste  
Minister of Agriculture, Lands, Housing and the Environment

## RESOLUTION OF THE SYMPOSIUM

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The participants in the Symposium agreed to the following next critical steps as the way forward towards the achievement of the overall objective:

1. The establishment of a Regional Programme for disaster risk management for the agricultural sector in the Caribbean.
2. The design and implementation of a regional catastrophic risk facility for agricultural insurance in the region.
3. That governmental support be provided to existing private sector insurance and reinsurance entities in the Caribbean utilizing the experiences gained in the present initiatives such as WINCROP and CCRIF and other such related ventures.
4. That the technical team established under the oversight of the Technical Management Advisory Committee (TMAC) will undertake the necessary technical work to complete the Action Plans for the regional insurance programme in the short term and the regional disaster risk management plan in the medium term. These Action Plans will include timelines for the completion of the identified activities.
5. The Chairman of TMAC will submit the Action Plans for the establishment of a Regional Agricultural Insurance programme and a Disaster Risk Management Programme for the approval of the Council of Ministers and subsequently to the Heads of Government.

## FACILITATED PLENARY DISCUSSION

Panel: Hilson Baptiste - Minister of Agriculture (Antigua); Dr. Vincent Little & Mr. Kervin Stephenson - IICA;  
Mr. Emerson Beckles - FAO

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### **Intervention – CARICOM**

The recommendation to COTED should be strongly worded to reflect that this decision is a regional venture.

### **Question - Senator Grant**

When is this expected to be done? Which Agriculture Minister to be responsible?

### **Response - Minister of Agriculture –Antigua**

All the players are present at this meeting and will contribute.

The Min. of Agriculture, Antigua is responsible for seeing this recommendation through. Copy of this report will be submitted to President Jagdeo.

### **Intervention - J. Green**

Agrees with the concept of public sector and private sector linkage

Commitment made for the farmer organisation's participation

A clear cut time frame is not evident

### **Response – Minister of Agriculture**

The TMAC will be responsible for setting the time lines and CAFAN is a member of the TMAC.

### **Question/Intervention - Agricultural Sector – B'dos**

There is the need to include insurance personnel when formatting the programme.

### **Response – Minister of Agriculture**

TMAC will again be responsible for ensuring that all the team players are on board.

### **Question/Intervention - Mr. F. Henry – Antiguan Producer**

It is very important that in country committees to look at efficiencies written in country to prepare for e.g. registration of farmers and organizing proper data collection because if you wait until COTED declares to act it will be a long time before all the ground work can be conducted thereby delaying the project much longer.

### **Intervention - Mr. E. Beckles - FAO**

The committee is chaired by Minister Baptiste and the action plan and players will be identified.

### **Comment - Ms. J. Aird – CABA Dominica**

Of note is the food security role played by food and nutrition where the disaster risk management strategy will include not only that but all other means and areas possible.

**RESOLUTION WAS MOVED AND UNANIMOUSLY AGREED TO**

***SESSION 11:***  
***Closing Remarks***

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Chair: Mr. Sergio Garcia  
CARICOM

**CLOSING REMARKS**  
CARLOS ENRIQUE ARCE  
WORLD BANK

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All participants were commended for being present and participating.

Having one outcome was difficult with so many countries coming together to form one resolution. Countries are not to stick to this basic resolution but to come up with an action plan. The plan should include insurance and mitigation strategies. Agriculture is dynamic and there is need for support.

The World Bank was optimistic and from the observation of the enthusiasm and determination of the participating countries the World Bank is even more optimistic that a suitable plan can be put in place for providing insurance for the agro industry.

**CLOSING REMARKS**  
MR. CLARENCE PILGRIM  
PERMANENT SECRETARY,  
MINISTRY OF AGRICULTURE, LANDS, HOUSING AND THE ENVIRONMENT, ANTIGUA & BARBUDA

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Thanked everyone for their participation despite the challenges involved in the hosting of the symposium, particularly with the interruption of air traffic by LIAT posed significant challenges preventing one of the main presenters from Spain in sharing his practical experiences in establishing and maintaining a regional Insurance programme. Despite the challenges, the symposium ended on a very high note as reflected in the full participation of all participants up to day three of the regional symposium. He was very optimistic that this will be taken at each country level with determination and commitment for the seeds planted at this symposium to bear fruit. Most importantly, the Ministry of Agriculture in Antigua is very comforted that the partners have pledged their support, and looking forward to the regional pledge of support at the upcoming COTED in 2010.

## LIST OF PARTICIPANTS

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## List of Participants

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ACP – African Caribbean and Pacific States  
CABA – Caribbean Agribusiness Association  
CAFY – Caribbean Agricultural Forum for Youth  
CAMI – Caribbean Agro Meteorological Initiative  
CAFAN – Caribbean Farmers’ Network  
CARICOM – Caribbean Community  
CARDI – Caribbean Agricultural Research and Development Institute  
CIMH – Caribbean Institute of Metrology and Hydrology  
CCCCC – Caribbean Community Climate Change Centre  
CCRIF – Caribbean Catastrophe Risk Insurance Facility  
CDB – Caribbean Development Bank  
CDEMA – Caribbean Disaster and Emergency Management Agency  
CFC – Common Fund for Commodities  
CRFM – Caribbean Fisheries Mechanism  
CCORC - Caribbean Coordinating Organisation for the Red Cross  
CMC – Caribbean Media Corporation  
CMC – Caribbean Meteorological Council  
CMF – Caribbean Meteorological Foundation  
CMI – Caribbean Meteorological Institute  
COHI – Caribbean Operational Hydrology Institute  
COTED – Council on Trade and Economic Development  
DBMC – Dominica Banana Marketing Corporation  
ENESA - Entidad Estatal de Seguros Agrarios (State Entity for Agricultural Insurance, Spain)  
EU – European Union  
EU-ACP – European Union/African Caribbean and Pacific  
FAO – Food and Agriculture Organisation of the United Nations  
GBCS – Grenada Banana Cooperative Society  
GCNA – Grenada Cooperative Nutmeg Association  
GIIF – Global Index Insurance Facility  
IDB – Inter-American Development Bank  
IFC – International Finance Corporation  
IICA – Inter-American Institute for Cooperation on Agriculture  
JAS – Jamaica Agricultural Society  
OECS – Organisation of Eastern Caribbean States  
RADA – Rural Agricultural Development Authority  
SLBC – Saint Lucia Banana Corporation  
SVGBA – St. Vincent Banana Growers’ Association  
UNECLAC – United Nations Economic Commission for Latin America and the Caribbean  
UWI – University of the West Indies  
WB – World Bank  
WHO – World health Organisation  
WINCROP – Windward Islands Crop Insurance  
WINFA – Windward Islands Farmers’ Association

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