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**A MODEL FOR AFRO-ASIAN AGRICULTURAL INSURANCE**  
**- A COOPERATIVE PUBLIC AND PRIVATE SECTOR VENTURE -\***

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## FOREWORD

Before beginning my talk on the subject of agricultural covers, I should like to express my gratitude to the Federation of Afro-Asian Insurers and Reinsurers, the Zambia State Insurance Corporation and in particular to Mr. W. B. Fyfe, the Secretary of the Organizing Committee, for the opportunity to share with you my thoughts on this important matter.

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**Dr. William M. Gudger**

**I. INTRODUCTION**

I should like to begin my talk today with some statistics that must be all too familiar to my audience, perhaps refocusing them somewhat to shed light upon the problem before us: whether and how can we serve the agricultural sector with insurance and reinsurance services that are all but taken for granted in other fields of endeavour. Let us begin with a brief look at the African agricultural sector. The agricultural sector of Africa as a whole is in the midst of a deep and prolonged crisis. Traditional self-sufficiency in staple crops is being lost. Imports of food grains grew three times faster than the population in the 1960's and the 1970's. Due to the increasing, and in some cases crushing, debt burden of the public sector, the continued ability of most African states to import the food required for the growing population is severely constrained. It is no exaggeration to say that either Africa as a whole must become agriculturally self-sufficient and cease to depend upon grains bought with scarce hard currencies or surely will risk a major economic, social and political cataclysm brought on by this inability to produce sufficient food.

The picture, however, is not as bleak as it appears. First, food grain yields in Africa are about  $\frac{1}{2}$  of what they are in Asia and Latin America. The Green Revolution has yet to make its impact upon the continent. Although wheat and rice are the major Green Revolution crops, there is little doubt that the same techniques can be applied to staple African food grains. Furthermore, 3 out of 5 Africans still work in agriculture. There is the labor, albeit untrained to produce the food. Land distribution has two very salient features for future development. Population pressure on the land on the whole remains quite low and ownership, unlike Latin America, tends to be quite egalitarian throughout most of Africa. Not only does Africa have very low man-to-land ratios, but farming is principally by family

units working 5 to 15 acres. I should also be noted that about  $\frac{1}{3}$  of the continent's best watered and most fertile lands are not farmed, principally because of the Tse Tse fly. Thus Africa confronts a major crisis in food production at the same time that it has at hand the physical assets of land, population and egalitarian access to meet the crisis.

What is required is obviously infrastructure, specific technical packages suited to dry lands as well as irrigated ones, agricultural education and extension and credit systems that reach and meet the needs of farmers who will take up the challenge of modern farming methods.

Does insurance have a role in a modernizing agricultural sector? I believe that it does. Agriculture is not different from other fields of human endeavor in that it requires some mechanism of effecting orderly intertemporal transfers. Indeed, agriculture may be exposed to a far greater extent than are other classes of economic activities due to its unique susceptibility to meteorological and climatological phenomena. It seems quite clear that agriculture is exposed to a plethora of risks beyond a producer's control. Insurance has been and continues to be the best mechanism for meeting uncertainty and unforeseen financial losses. I should like to emphasize this point: insurance is a financial mechanism. In agriculture, as in other fields, it is a way of protecting against a loss of economic resources.

All too often agricultural insurance has been misunderstood even by its most vociferous advocates. Agricultural insurance can not make an unviable project viable or a foolish venture less so. Somebody always pays the bills, or, as we say in the American idiom, "there ain't no free lunch". Areas struck regularly by drought and flood are first of all candidates for irrigation and drainage. Crops produced with poor technology or on inadequate soils are not helped by insurance. If insurance is not a substitute for infrastructure neither is it a substitute for technology, education and extension. Should farmers lose because of price variability due to government price, import, and exchange regulation policy, insurance will not deal with these losses successfully.

Agricultural insurance is instead the indicated mechanism to protect semi-commercial and commercial farmers against unforeseen and unavoidable losses. It provides the guarantee and the security to permit a producer, be he agricultural or livestock, to invest additional resources in modern and more productive techniques while protecting these resources against loss. While it is not a substitute for infrastructure, for education and extension, and for animal health programs, it can be a crucial supportive element to encourage and incentivate farm modernization while protecting the producer against unforeseen loss.

Like other insurances, "for every risk there is a rate". However, do not be surprised that if in the absence of a modern farming sector that rate will turn out to be prohibitively high. Agricultural insurance goes hand in glove with modern production methods and supports them; it is not a substitute for them. To ignore this lesson is to relearn a very costly lesson. Just as surely as you as insurers would be reluctant to insure a poorly constructed building put up by a novice builder located on shifting soils, so too should you consider both the technology and the human element in designing agricultural covers. By this I mean that insurance must be sold to those who have a reasonable expectation of turning a profit on their investment and who wish to protect that investment through both good husbandry and through insurance as a means of intertemporal transfers--and who do not view insurance as either a lottery or as means of receiving yet another state subsidy. These "non-serious" farmers poise a great moral hazard to the insurer and punish conscientious farmers with high rate and administrative costs.

## II. THE STRUCTURE OF AGRICULTURAL INSURANCE

### Public Sector Insurance

With these considerations in mind, I should like to proceed to the fundamental concern of this paper: the role of the public and private sectors in offering, managing, and paying for agricultural insurance. I have expanded slightly upon the topic given to me to include the private sector in my considerations. The

problem faced is of such a magnitude that it is worthwhile to bring to bear all the available knowledge and resources instead of considering agricultural insurance to be only a public policy problem.

Most of the agricultural insurers of the world today are public sector institutions. The U.S., Canada, Japan, Sweden and other developed countries have government corporations to administer agricultural, usually crop, insurance. Mexico, Costa Rica, India, the Philippines, and Zambia among others in the developing world administer their programs as public sector programs or through publicly-owned insurers.

It is most unfortunate that history seems to show, at least in Latin America, that public sector insurance is very inefficient, requires heavy subsidies that frequently exceed the government's financial capacity and frequently very heavily politicized. Insurance is furthermore often used to cover up the inefficiency of other public institutions such as agricultural lending banks<sup>1/</sup>. I do not mean this as a blanket indictment of public sector entrepreneurship; nor is it to deny that government has a legitimate interest and role in agricultural insurance.

Public sector insurers in my view suffer from several severe problems that quickly converts them from insurers (if indeed they were in the first instance, designed to be that) into subsidy or farm income support programs. Public sector insurers first fall under bureaucratic personnel rules, thus who is hired and fired escapes management's control. Indeed management itself is often appointed and changed based upon considerations exogenous to the financial results of the company. There is usually little incentive to sell the products; the company usually offers a very limited range of products in any case. Finally, management frequently is not overly concerned about the financial results as they pass their losses on to government. It is not surprising that in these conditions reinsurance markets have been very cautious.

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<sup>1/</sup> In a recent World Bank Policy Paper, 15 programs in developing countries and 7 programs in developed countries were surveyed. With few exceptions, they were government insurers heavily subsidized for premium and/or administrative costs. Only 5 had commercial reinsurance, and that small number has recently been

Subsidies appear to be almost universal in public sector insurance. Usually operating costs and some part of the premium (or indemnities) are paid from the public coffers. Given this subsidy, it is hardly surprising that premiums, covers, crops and frequently indemnities are politically influenced or decided. Loss adjustments may not be neutral. To take a concrete case, Mexico has a nationwide insurance program which now costs the country about \$800 million U.S. per year<sup>2/</sup>. Few countries, except the larger petroleum exporters, can sustain this level of cost. Public sector insurance is under very strong pressure to depart from traditional insurance principals. There are far more cost efficient ways of offering farmers production subsidies and income support payments. Insurance in my view should not be used primarily to effect transfer payments, however meritorious and needy the recipients, and that unfortunately has been the fate of the public sector programs with which I am acquainted.

#### Private Sector Insurance

The alternative to a public sector program is to leave the development of agricultural insurance to the private sector. Again the historical record is not very encouraging. In the U.S., there is a small hail insurance industry and several small livestock insurance companies. Europe also has companies offering limited agricultural and livestock covers. Overall, the private sector activities in the field are still quite limited. There are to my knowledge no large scale programs of extended or all risk insurance in the private sector, with the possible exception of a grain growers' insurer being formed in Australia and a South African coop insurer. The problems of multiperil insurance for the private sector are difficult to overcome. The start-up cost

<sup>2/</sup> That is, \$12.30 per capita. A similar program would cost Zambia for example, over \$65 million per year while in a larger country like Tanzania, the cost could reach almost \$200 million. The magnitude of these numbers council caution in embarking upon a state run scheme. In Costa Rica between 1970 and 1982 when population rose from 2 million to 3 million, the state run insurer lost almost \$30 million U.S. insuring several thousand large rice farmers in a drought prone province when the money should instead have been invested in irrigation.

is quite high as data must be collected and processed for many years to provide a reliable rate making basis. Administrative costs are very high for agricultural coverages as special staff must be recruited and trained to serve scattered farm populations under difficult conditions.

The single most limiting factor, however, is that there is at present no way to manage the catastrophic loss potential of insurance. This problem has several aspects: first, there is no independence of losses among units of exposure. On the contrary, everyone may be hit simultaneously over a very large area. Second, the frequency and severity of losses are still unknown. Third, there is not currently available reinsurance capacity for more than a small fraction of the reinsurance that would be generated by large nationwide programs. Finally, there is simply no way that a private insurer could reserve and reinsure against a loss of the magnitude implicit in agricultural insurance. Bear in mind that a 5 % premium will with unknown frequency produce loss ratios of 2,000 %! I would call your attention to both the Sahaelian drought and the "El Niño" Pacific high pressure system which produced massive agricultural losses from Indonesia to Brazil and now is apparently causing widespread drought losses in Southern Africa.

It is also worth noting that if a private company would have difficulty developing an adequate portfolio, the international reinsurance markets would face a similar problem. We have seen that phenomena such as a Pacific high pressure system affects agriculture in one-half of the world. Likewise, there is simply not enough reinsurance capacity worldwide. At present there is \$2-3 billion of worldwide capacity. If, for example, 10 % of the value of agricultural production in Ghana were insured, about \$1 billion in reinsurance capacity would be required. A similar amount of insurance in Nigeria would require almost \$2 billion in capacity exposed to the catastrophic losses of agriculture. To carry the calculation of needed capacity to reinsure 10 % of all of Africa's agricultural production is an exercise in futility as it would exceed capacity by a large multiple. And in years like

this one losses would be staggering. It is not in the interest of anyone to endanger the world reinsurance system by placing very large volumes of risks that can, and in some cases will, suffer simultaneous losses.

Thus, agricultural insurance is something of a paradox. Only a public sector insurer has the financial muscle to absorb the catastrophic loss potential and the high start-up costs. It, however, tend to develop a relatively inefficient administration and to violate traditional insurance principals to pursue social goals<sup>3/</sup>. The private sector is of necessity driven by a "bottom line discipline" and is consequently relatively efficient in the administration and does not depart markedly for sound underwriting, pricing, and loss adjustment practices. It, however, can not reserve or reinsure against catastrophic losses characteristic of agricultural business.

#### A Theory of Comparative Advantage

I should like now to propose a solution to this paradox in which the public sector has the capacity but not the administration and the private sector can administer the business if only it had the reinsurance capacity. The solution seem to me to be a marriage of convenience and mutual benefit in which the private sector administers basic coverage and the state provide the capacity.

Quite simply what I propose is a scheme of cooperation between the sectors in which the private sector brings to bear its very substantial administrative expertise while the state uses its financial strength to ensure the solvency of the scheme and to facilitate extending coverage to groups that would otherwise not be commercially insurable. Diagram N°1 outlines the basic structure of the public-private partnership as it concern

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<sup>3/</sup> And, I say again, that I do not oppose those goals per se. Instead I argue that there are more cost efficient ways of meeting them.

the "commercial" risks. By commercial risks, I mean quite simply those that reinsurance markets are willing to accept from soundly rated, well run national schemes. As a general rule, markets will accept some quota share and a lower layer or two of stop-loss. They would in my opinion be ill advised and poorly served to accept catastrophic business, at least at the outset.

The catastrophic risks I propose be managed by in the first instance a national concessional reinsurance account. This account could be managed by either the central bank or by the treasury. It is important to note that the account is national; no international pooling of catastrophic risks, unlike the commercial risks pool, is proposed here. It is dubious that an international catastrophic risk pool could long survive as there would be a major temptation for one or more countries who were strapped for cash to decapitalize it. The national concessional reinsurance would not be free but would make a negotiated charge<sup>4/</sup>. It would also serve as the subsidy channel to permit the underwriting companies to serve groups that could not be insured at acceptable costs or rates. This account would be capitalized through an annual budget appropriation, thus gradually relieving the government of the responsibility of having to mount ad hoc disaster relief programs after the fact.

In those few cases where the loss was of such a magnitude as to exceed the capacity of the national facility, national governments could have prenegotiated contingent loan agreements in place with international financial institutions such as World Bank to recapitalize the national account.

To this scheme, I have added two advisory groups. The first, recommended by the 8th FAIR Conference, is a R+D center to develop new products, prepare statistical and technical information on

<sup>4/</sup> There is a subtle but important difference here worth noting. As a general rule, governments simply go ahead and insure groups that could not be served commercially and assume that a) either they won't lose; b) that if they do, the insurer will pay or; c) they probably won't be around when the bill comes due. If government negotiates the administrative costs and indemnity payments, it has to provide explicitly for the former and prepare for the latter.

agricultural insurance. The second group, composed of outside and financially disinterested insurance professionals, would review all important aspects of the risks ceded to the commercial regional pool, and serve as survey agents for the international catastrophic loss facility. They would in effect umpire the game to keep it as fair as possible.

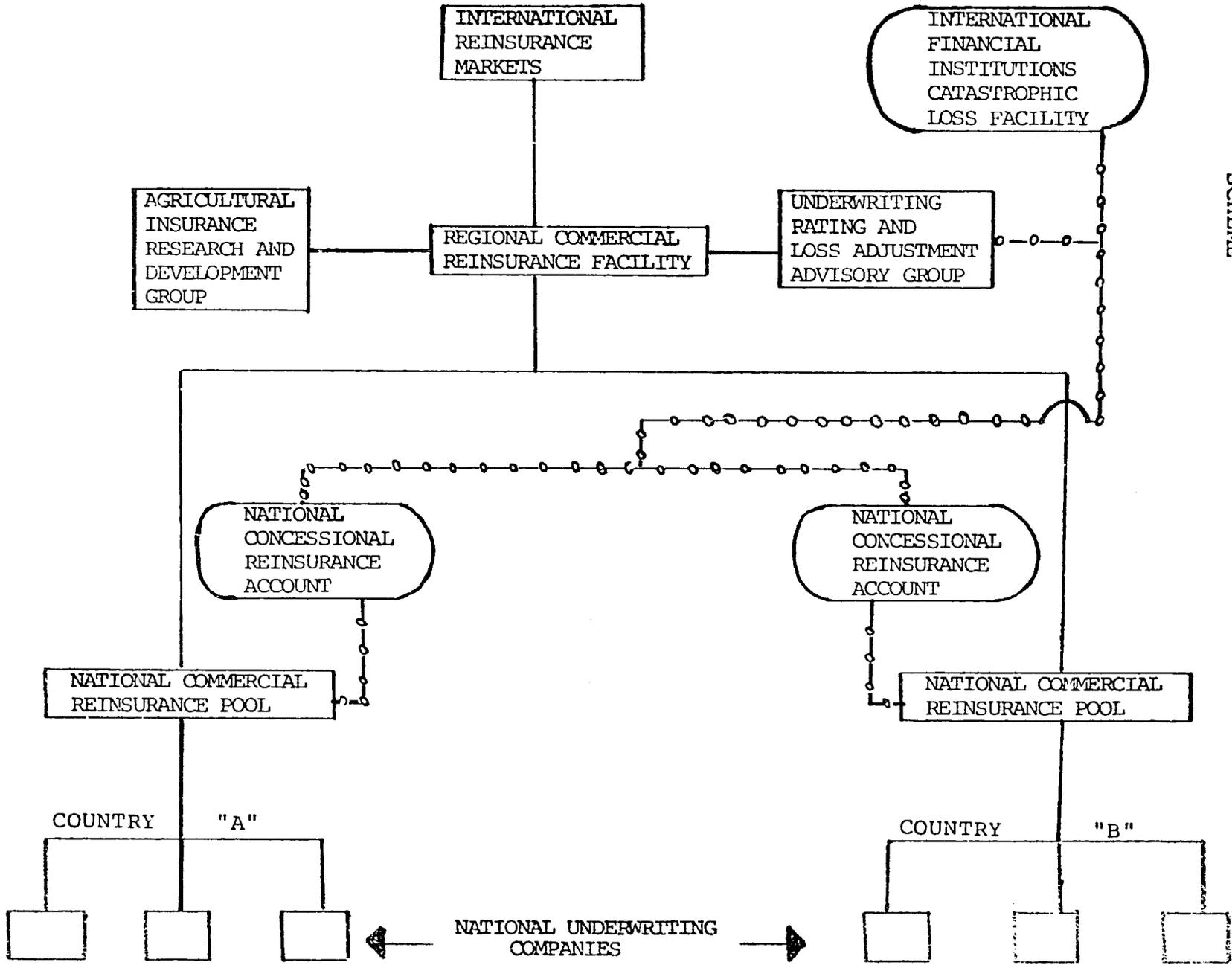
Let us then see how this scheme would work. Small losses are paid by the pool of national underwriters. Through treaties, larger exposures have been ceded to a national commercial pool composed of all admitted insurers and reinsurers<sup>5/</sup> (if the number is quite small, reinsurance could be handled by the underwriting pool directly) who in turn have treaties with the regional pool which has retroceded to the international reinsurers. This system should be able to offer substantial quota share capacity, and through stop-loss cover to absorb losses up to the 500 % - 800 % loss ratio range.

When losses are truly catastrophic, the national concessional reinsurance account is liable. At the same time, the account recurs to a prenegotiated concessional loan which is disbursed in hard currency to meet local currency obligations. Both in this case, as with an indemnity from the regional pool, the rating and loss adjustment group will survey claims before disbursements of indemnities.

This process is not new. It in fact already exists albeit on and ad hoc, usually chaotic basis. After a disaster, the state has to seek unbudgeted funds to meet the needs of affected citizen and at the same time to make the rounds of international financial institutions seeking emergency relief grants and loans. Prenegotiated concessional loans could obviate this process just a regular annual

<sup>5/</sup> Here I am proposing something approximating the Spanish system where as a condition of being admitted, a company must accept a small portion of the retrocession of companies writing agricultural business.

DIAGRAM N°1: PUBLIC AND PRIVATE SECTOR AGRICULTURAL INSURANCE SCHEME



capitalization of a national concessional reinsurance account could replace the frantic scramble to reprogram funds for disaster relief.

To close, I should like to emphasize several points that seem to be critically important to me. First, we must develop a new model. To continue to use the public sector model is to run the risk of developing prohibitively expensive programs that simply can not be sustained over the long term. The self-evident facts are that upon close examination almost all the schemes in the developing countries are inefficient, heavily subsidized and frequently heavily politicized. In more than a few cases, corruption is a significant factor. Public sector programs have become disguised subsidies that are insurance in name only.

Second, the proper role of government is to facilitate and encourage the development of a well-managed rural insurance market. Just as a government guarantees many other financial transactions without engaging directly in them, it can provide the basis for the development of an orderly insurance market in the rural areas by bearing the catastrophic risks which devolve upon it in any case.

Third, agricultural insurance is a new field. There has been no systematic research on the issue. We in our small institution have at least lit a candle in the dark and have illuminated how much we do not know. Let me put an analogous situation before you: Suppose that as insurers you could not avail yourself of the research done on building methods and materials for your fire and earthquake covers or had no information on the cause of auto accidents or the effect of road construction and automobile building methods on loss costs. If this were the case, your situation would be similar to the one confronted in agricultural insurance. At present there is a desperate need for research and development. I call upon you to collaborate to establish such a Research and

Development facility to work both on the conceptual and theoretical problems<sup>6/</sup> of agricultural insurance and upon the analysis of the more mundane aspects of coverages, rates, forms, administration, and reinsurances.

Developing agricultural insurance is a long term endeavour. Both theory building and careful analysis of existing and new programs are important if we are to develop coverages that are viable over the long term. In closing, I would recommend to you a careful experimental approach, for much is unknown and the risks are great, a pooling of knowledge and a sharing of experiences through systematic exchanges of information. To go one step further than the 8th Annual General Meeting of FAIR, I would suggest to you that you establish a Research and Development Exchange Center not only to collect, organize, prepare and distribute data on agriculture to insurers and reinsurers but also to serve as a pool of expertise to assist in the design and operation of agricultural schemes. The talent pool is quite small indeed and should form a "critical mass" rather than being dispersed.

In conclusion, cooperation and the traditional goodwill of insurance are the crucial factors in extending the frontiers of insurance into a modernizing agricultural sector: cooperation between the government and the industry, cooperation within the developing world and cooperation between the industrial North and the agricultural South and most importantly cooperation within all sectors of the industry. We must first create our small laboratory experiments, learn from them and share that knowledge. We must likewise share the development costs within the industry, with insurer and reinsurer alike sharing with the respective governments these development costs and most importantly the new knowledge generated. It is premature to concern ourselves with the traditional competitive preoccupation about market

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<sup>6/</sup> I have briefly described our "portfolio management" approach to the selection and rating of agricultural risks and the assembling of a risk portfolio in a paper to be presented at the Tenth Annual General Meeting of the Insurance Association of the Caribbean. Copies can be obtained from the author.

shares; we must work jointly to create the market; to develop truly useful coverages for what is the largest and, ultimately as we all eat from the land, the most important industry in the world. It is no small task we are embarked upon; the answer will not likely come in an Einsteinian quantum leap but instead through a gradual accumulation of data and experiences. Finally, we can not wait until some one does it for us and writes us a textbook; as insurers and reinsurers it incumbent upon us to act. It is we and we alone who will expand the frontiers of insurance. Just as surely as two centuries ago some intrepid souls turned insurance from the seas to the cities so too will it be some of us who begin to move from the cities to the countryside. That move will be greatly facilitated through our collaborative efforts, our joint investments, and our mutual goodwill.