

## Description of 2007 awarded achievements

**The Jury for the Sasakawa Award for Disaster Reduction 2007 has unanimously decided to select two Laureates, Prof. Yoshiaki Kawata and Mr. Tony Gibbs, and to select 4 organizations for the award of Certificates.**

Following careful, thorough deliberation and its evaluation of the submitted material, the Jury for the Sasakawa Award for Disaster Reduction has unanimously decided to select two Laureates for the year 2007 and to select 4 organizations for the award of Certificates (one for Certificate of Distinction, and three for Certificate for Merit)

### LAUREATES 2007

It was decided that the Laureates for 2007 should be Engineer **Tony GIBBS**, a Director and Partner in an Engineering firm and a citizen of Grenada and Barbados, and Professor **Yoshiaki KAWATA**, Director of the Disaster Prevention Research Institute of Kyoto University and Director of Disaster Reduction and Human Renovation Institution, a citizen of Japan. This recommendation for the Joint Award followed the Jury's assessment of the lifetime contribution of both individuals, and their outstanding commitment to disaster reduction efforts and related capacity building at the national, regional, sectoral and international levels. The award also recognizes the efforts of these individuals, - both trained as engineers - to communicate effectively on hazard and risk related issues with a wide range of stakeholders including natural and social scientists; journalists and the media; opinion shapers and decision makers, as well as the general public.

Engineer Gibbs is a graduate of the Queens University of Belfast and the University of Leeds and is Fellow of the Institution of Structural Engineering and the Institution of Civil Engineers (UK). He has practiced as an engineer in the wider Caribbean area for the last four decades and has consulted globally on wind and earthquake resistant design. He has made a significant contribution to hazard awareness and disaster risk reduction in many developing countries particularly those of the Caribbean and has been closely associated with measures taken to increase the resilience of the health sector. He has also contributed to the field by assessing damage following severe events and ensuring that local standards and design manuals are appropriately updated based on lessons learnt. For several decades he has taken a leading role in sharing his knowledge, insights and expertise with the public as well as a wide range of professionals, in training and in practice, through talks and lectures which have emphasized comprehensive risk reduction approaches as a comprehensive sustainability in island developing states.

Professor Kawata, who received his PhD from Kyoto University, is an eminent leader in the field of Disaster Studies and has devoted his career to researching, teaching and sharing his deep insights into this significant challenge to societal sustainability. His research has resulted in better insights on the part of humanity into meteorological and seismic hazards. He has done pioneering and widely recognized work related to

engineering and human vulnerability and proposed systems to ensure resilience at sub-national, national and international levels. His efforts to develop integrated approaches with other specialists, particularly those in the social science spheres, are noteworthy; as are his initiatives which have led to the sharing of Japanese experiences and lessons learnt with neighboring countries and the international community. Prof Kawata has also made a significant contribution to crisis recovery and environmental management after extreme events through his personal efforts and by utilizing the research capacity at his disposal to ensure that a 'culture' of resilience is promoted in the reconstruction programmes.

Both laureates are being recognized for their lifetime accomplishment in the field, their dedication to the promotion of research based improved practices, their integrated and comprehensive 'joined up' approach and their significant contribution to the sharing and diffusion of ideas about Disaster Risk Reduction. The Jury understands that both laureates have proposed to utilize the award to advance capacity building.

### **Certificate of Distinction**

The Sasakawa Jury has selected for Certificates of Distinction **ActionAid International**, a South African based International Non-Governmental Organization. Since its establishment in 1972, ActionAid International has focused on poverty related issues and has successfully integrated issues such as gender, education, governance and food security in the programmes and project activities they have implemented with diverse partners in over 40 countries in Asia, Africa and Latin America. They have played a pioneering role in incorporating disaster risk reduction into their national, sub-national, sectoral and community initiatives and have facilitated the development and introduction of the Hyogo Framework as a component of these efforts at moving societies toward inclusive, integrated strategies and plans for achieving sustainable development in the near future. The work of ActionAid International related to DRR and their strategies, methods, tools and lessons learnt related to sustainability has been generously shared and widely diffused to a global audience through a variety of modalities.

### **Certificates of Merit**

The Jury has also selected for Certificates of Merit three entities, **The Social Action Centre - Prelature of Infanta (Philippines)**, **Red Habitat en Riesgo (Argentina)** and **the Disaster Mitigation for Sustainable Livelihoods Programme (DiMP) (South Africa)**. These organizations are being recognized for their dedicated pioneering work that has led to increased resilience of societies in their spheres of influence. Although emerging from different contexts – charitable works and from the field of science, livelihood and health – they have moved beyond the orientation of relief and reaction to undertake analysis, documentation of lessons learnt, outreach and networking to ensure that formal and informal learning from disasters is enhanced and institutionalized. All these awardees are making significant contributions to Disaster Risk Reduction. The innovative and diverse information material produced by Red Habitat en Riesgo using a variety of technologies and widely disseminated in Latin America deserve more recognition and emulation.

The Jury wishes to commend the candidates, many of whom demonstrated dedication, innovative approaches and we were particularly pleased to see the many instances where outreach, extension and networking initiatives were being actively and aggressively pursued in spite of significant resource (and governance) challenges and constraints. We sincerely hope that these awards will stimulate further efforts in the field, encourage wider nominations for the Sasakawa Laureate in this field and most importantly contribute to the wider application of the Hyogo Framework and mainstreaming of Disaster Risk Reduction.

## Interviews

Yoshiaki Kawata, 2007 Sasakawa Award Laureate



“The Kobe Earthquake museum houses the living memory of what should never happen again.”

The UN Sasakawa Award Jury has selected Yoshiaki Kawata, from the Disaster Prevention Research Institute in Japan as one of its two 2007 Laureates.

Yoshiaki Kawata, a prominent professor in the field of disaster risk reduction at Kyoto University, was awarded for his promotion of research and knowledge about past disasters. In particular he has highlighted the bitter lessons learned from the Great Hanshin Awaji Earthquake (Kobe), which killed more than 6400 people and is considered as one of the most dramatic and costly earthquakes in Japan history. In a commemoration of the 1995 Kobe earthquake Professor Kawata established the Disaster Reduction Museum in Kobe, and has carried out numerous research projects on the lessons learnt from the earthquake regarding response, reconstruction and restoration.

Why are the lessons of the Kobe earthquake so important in Japan?

Rapid economic growth started in Japan around 1960 and every big city expanded until about 1995. At the centre of all these cities are older inner cities, where the infrastructure is ancient, and where many elderly people live due to cheap housing and other low living costs. So in every inner city, there is a high level of disaster vulnerability. Kobe was a typical big city with these characteristics. In Japan, big cities such as Tokyo, Nagoya, Osaka, Sendai, Fukuoka are located on active faults with earthquake magnitudes of more than 7, and could one day suffer a similar earthquake to Kobe.

### **Why did you set up the Museum?**

We have learned many lessons from the Kobe earthquake that can be communicated to others. The Kobe Earthquake museum houses the living memory of what should never happen again.

It is very important to transfer these lessons to the next generation and to the rest of the world. In collaboration with disaster victims, local citizens and volunteers, the Museum exhibits live documentary experiences and lessons of the earthquake to the people of the world, as well as to children, who will shape the future. The Museum motivates citizens and visitors to take a sincere interest in, deliberate upon, and understand the importance of disaster reduction, the preciousness of human life, and the value of our mutual dependence as human beings.

### **How did the Kobe earthquake research contribute to improve the worldwide knowledge about earthquakes?**

People can understand the difference between plate boundary earthquakes and inland earthquakes due to active faults. Even if the probability of an earthquake occurring is small, estimating damage before disasters happen is very important. The process of an earthquake's epicenter can be clearly analyzed with networks of seismographs. GPS data can explain the balance between two plates' boundaries. The process of propagation of the P wave and S wave was used for emergent issue of warning, before damage was generated.

### **How did you contribute as a researcher to improve Japanese disaster management capacity?**

After the Kobe earthquake, we began to understand the importance of information. Therefore, we now use GIS as well as GPS to manage damage. Also, the Museum conducts training of local government staff who play central roles in disaster management. In these training programs, the Museum shares the experiences of the Earthquake, and systematically provides practical knowledge and skills in disaster reduction, based on the latest research results. The Museum thus contributes to upgrading the emergency management capacity of local government.

**As a professor and communicator, you attach a huge importance to the transmission of knowledge through recreating lived experiences, and learning lessons from major disasters. How do these lessons contribute to keep the collective memory alive and educating people on disaster risk reduction issues?**

After the Kobe earthquake, we had seven major earthquakes in Japan. We learnt so many lessons from them and every time there was another, we could check the applicability of those lessons by trying them out in practice. We also continued the field survey on recovery processes from the Kobe earthquake. The data was persuasive for new victims and local government officers. I delivered more than several hundred lectures to people and appeared on television about 200 times during the last ten years.

**Today you head one of the biggest institutions on Disaster Risk Reduction (the Prevention Research Institute). Do you think that the exchange of knowledge and information between universities and countries is key for advancing disaster risk reduction issues?**

Yes. I have sat as a member on many disaster risk reduction committees in central and local governments. The reduction policy needs the background of implementation science. I have written more than five hundred technical papers. And after the Kobe earthquake, as an editor in chief, we printed a new academic journal on the subject. With our technical support, policies should prove effective.

**What are you planning to do with the money you have received from the Sasakawa prize?**

We have a plan to promote a symposium on the lessons of disasters, and transferring those lessons to the next generation and the world.

**You have been in the field of DRR for more than 30 years, how do you judge the progress made so far in disaster risk reduction policies? And what is missing according to you, that should be made a political priority?**

Our central and local governments have adopted a disaster reduction strategy covering the next ten years or more. Long-term perspectives are very important in the successful promotion of issues like disaster warning and retrofitting houses. Our government is making consistent efforts now, to make sure the goal of the disaster reduction strategy will be accomplished. But due to budget restrictions and rotation of government officers, we have to keep coming up with new ideas and proposals.

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Tony Gibbs, 2007 Sasakawa Award Laureate

“The most expensive hospital is the one that fails”

The UN Sasakawa Award Jury has selected Tony Gibbs, a national of Grenada and Barbados currently working with the Pan American Health Organization (World Health Organization in the Americas) on hospital safety, as one of its two 2007 Sasakawa Award Laureates. A pioneer in promoting safe architectural designs against natural hazards, he has made a significant contribution to hazard awareness and disaster risk reduction by designing building structures resilient to earthquake and wind forces.

**Why did you start working in this field of hospital safety?**

From the start of my professional career I worked with companies and engineers who were concerned about designing structures to resist the natural hazards of hurricanes and earthquakes. So I took it for granted that I should pay attention to these matters. In particular, the Pan American Health Organization (World Health Organization in the Americas) gave me the opportunity, starting in 1985, to work on vulnerability analyses and retrofitting of existing healthcare buildings, and on design issues for new buildings.

**Is hospital safety an urgent matter to be addressed?**

The question of the resilience of hospitals to hurricanes (and earthquakes) came into sharper focus for me when, in a series of natural hazard events in the Caribbean during the past 35 years, hospitals suffered at least as much damage as other less important facilities. These events were hurricanes in 1979 (Dominica), 1988 (Jamaica), 1989 (Montserrat), 1995 (Antigua), 1998 (St Kitts), 2004 (Grenada) and earthquakes in 1973 (Antigua), 1997 (Cariaco, Venezuela), 2003 (Dominican Republic), 2004 (Dominica). Some of these buildings were relatively new. Clearly, a fresh approach to designing, building and maintaining healthcare facilities is required. Part of this fresh approach must be the routine independent checking of designs and quality assurance procedures during construction.

**What are your main achievements in this area?**

I consider that my main achievement in this area is to convince others (owners, designers and builders) that success is possible, that disaster is not "natural" and that money (or the lack thereof) is not the problem. Indeed, the most expensive hospital is the one that fails. Paradoxically, the poorer the society, the more resilient the hospital should be. Poor societies cannot afford failures. There must also be the recognition that in small, island countries there are usually single referral hospitals. If the one hospital is destroyed or damaged so that it cannot function effectively when it is most needed, that becomes part of the problem and not part of the solution. That is a disaster. An important part of my role is the empowerment of those who are the owners, custodians, managers and procurement officers of healthcare facilities. In fulfillment of that role I write and lecture to those people about how they should brief architects and engineers, what they should expect from architects and engineers and how to monitor the work of architects and engineers.

**How do you make hospitals resistant to earthquakes? Could you explain how your designs protect buildings against wind and earthquakes in simple words?**

The philosophy of earthquake-resistant design is conventionally different from the philosophy of wind-resistant design. Conventional design against earthquakes aims to protect lives (not buildings) in extreme events. This is unsatisfactory for critical facilities, such as referral hospitals, which are required to function to their optimum immediately following a very damaging earthquake. Conventional earthquake-resistant design aims to absorb the seismic forces through ductility in the structure accompanied by the (hopefully predicted) "failure" of pre-selected elements. This is admittedly a difficult concept to appreciate. This leads to a less than functional hospital. To achieve fully-functional hospitals we should adopt base isolation techniques (isolating the building from the oscillations of the ground) and install mechanical energy-absorbing devices in the superstructure of the building.

The philosophy of design against hurricanes is to achieve complete success (no significant damage to the building) in a severe event. The focus here is usually on the external envelope - external walls, windows, external doors and roof covering. Unfortunately, these components are rarely within the mandate of the structural engineer. In designing these external elements we must concern ourselves not only with wind forces, but also with flying debris.

**Is it the same technique?**

Designing against multiple hazards is more than doubly difficult when compared with designing against a single hazard, especially when those multiple hazards are wind and earthquake. Many favorable features of wind-resistant design are unfavorable for earthquake-resistant design, and vice versa. Heavy structures resist winds better. Light structures resist earthquakes better. Flexible structures attract greater wind forces. Stiff structures (generally) attract greater earthquake forces. Both hurricanes and earthquakes impose horizontal loads on buildings. Earthquakes also impose significant vertical loads on a building overall. The vertical loading from wind is usually determined by aerodynamic considerations. However, there are many similarities in the effective design

and construction of buildings to resist hurricanes and earthquakes: Symmetrical shapes are favorable. Compact shapes are favorable. There must be a realization of the real risk that "design" forces may be exceeded. This is particularly so in the case of earthquakes where, largely for economic reasons, the design force is deliberately determined to be less than that expected during the anticipated life of the building. This leads to a requirement for redundancy in the structure and for "toughness" – the ability to absorb overloads without collapse. Connections are of paramount importance. Each critical element must be firmly connected to the adjacent elements. There is a basic difference in the performance expectations in the event of an earthquake as opposed to a hurricane. A building is expected to survive its "design hurricane" with virtually no damage. Even a catastrophic hurricane should only lead to repairable damage. On the other hand the "design earthquake" is expected to cause (hopefully repairable) damage, and a catastrophic earthquake is likely to lead to a situation where the building cannot be repaired and must be demolished. In such an event, success is measured by the absence of deaths and serious injuries.

#### **How much does it cost to do it?**

The answer to the question depends greatly on the design concept. If the concept, shape and configuration of the building faithfully follow the precepts of good earthquake and hurricane resistant design, then the cost is insignificant.

In the case of hurricanes that cost could be about 2%. In the case of earthquakes that cost could be 3.5%. In the case of both hurricanes and earthquakes the combined cost could be as high as 4.5%. These are conservative figures for new buildings. The cost of retrofitting existing buildings could be much higher, especially in the case of earthquakes

#### **Why governments do not do it systematically? What are the challenges and main problems to address the issue?**

This is the most difficult question of all to answer. I should be a politician to do so, but I will try. Part of the answer is the erroneous perception that resilient buildings are not affordable. Part of the answer is that earthquakes and hurricanes are low-frequency events in any single location and it is unlikely that severe earthquakes and hurricanes would occur during the 5-year lifetime of a democratically elected government. Part of the answer is that, remarkably, multi-lateral funding agencies are unwilling to impose appropriate technical standards as conditions precedent to disbursement of loans and grants.

#### **Is it also due to a lack of knowledge among engineers and architects?**

Certainly, educational programmes in universities fall short of what is required in the fields of earthquake-resistant and wind-resistant design. Then in the "real world" most regulatory agencies are ill equipped to effectively check the designs presented to them for approval. The designers therefore have insufficient incentive to become really proficient in the relatively difficult areas of earthquake-resistant and hurricane-resistant techniques.

#### **Climate change is making the issue more urgent, what needs to be done and what is realistic to do?**



Climate change has the potential to increase the frequency and severity of hurricanes. This can be dealt with simply by an "overlay" or additional factor to be applied to the basic wind speed in determining the appropriate design wind speed. The factor would depend on the anticipated life of the building. I say "simply". However there is a difficult part. That is determining the values for the factor. So far this "overlay" does not appear in any known design standard. However, I am working on it.

**Your designs have influenced design standards worldwide. How did a small island like the Barbados managed to lead the way? How did you manage to influence the world?**

First of all I must say that I work throughout the Caribbean, not only in Barbados. I went to school in four Caribbean countries, starting in my home country of Grenada. I have lived in six Caribbean countries. I have worked professionally in all but one of the Caribbean countries - English, Spanish, French and Dutch speaking. I have had tremendous support regionally and internationally from organizations such as PAHO-WHO, UNDP, the Organization of American States, the Caribbean Development Bank, The Institution of Structural Engineers (UK), my own firm (Consulting Engineers Partnership Ltd) and from Professor Alan Davenport of the University of Western Ontario.

**Have you only specialized on hospitals or have you focused on other buildings?**

Most of the work during my career was not in connection with hospitals. I started my career as a general civil engineer. Then I gravitated towards structural engineering. Soon after I began concentrating on structures to resist earthquake and wind forces. Now I spend a lot of time in connection with healthcare buildings.

**You have said that you will develop a post-graduate course in engineering for building design and damage mitigation for natural hazards. Why is it such a priority and how will the award money be used to support it?**

One of the main problems to be solved is how to ensure that hospitals remain fully functional during and immediately following severe hurricanes and earthquakes while considering the usual financial constraints. Dealing with the hurricane hazard requires special attention to be paid to the building envelope in general and to glazed openings in particular. Dealing with the earthquake hazard requires the application of energy absorption devices in superstructures and the application of base isolation.

The construction industry (design engineers, architects and constructors) are generally unfamiliar with these techniques. There is the need to bring these techniques into the mainstream of hospital design and construction. In order to do so, primers (introductory books) are required; focused courses for architects and engineers are required; and oversight on demonstration projects is required. The Award money would be used to seed these activities.