

Innovation for Resilience and Transformation

復興と変革へのイノベーション

Proceedings

The 3rd Environmental Innovators Symposium

December 21-22, 2012, Keio University, Hiyoshi Campus

Wanglin Yan

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Editors

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Introduction

On December 21 and 22, 2012 some 120 people gathered to discuss the issue of resilience from the perspective of several fields, including architecture, policy and climate science.

The growth of resilience as a touch-point for fields as distant as economics, architecture and population politics reflects a shared concern about our capacity as governments and individuals to cope and adapt to change, regardless of its cause. The ability to bounce back from hardship and disaster is essential to all our futures, but if it is to be done sustainably, innovation will need to be a core practice. Which is of course easier said than done.

In Japan the context for resilience remains the ongoing recovery from the series of disasters that struck the northeast coast in March 2011. The disasters triggered an honest re-assessment of many of the policies and social standards the country has taken for granted for decades. A more resilient society could be built as part of the reconstruction process, but there is no clarity yet about which direction the reconstruction should go, and what resiliency might mean. The question remains open as to whether we should be rebuilding defensively or if we might be better off aiming for a deeper transformation. As the reconstruction proceeds there is also growing uncertainty about where and how change can be implemented. Although the challenges do not arise directly from global climate change, they share much with the problems expected from extreme weather events, as we are all too keenly reminded of by the massive storms and floods and the related damage and power outages experienced around the world.

The largest gap is that between assessment and action. While we understand the situation better and better, the way forward is still hard to imagine. In the third annual Environmental Innovators symposium our aim is to clear some of the uncertainty around the topic of resilience by bringing together practitioners who are testing new methods and taking action in the field with significant projects. Our position is that while there can be no single answer it is the accumulation of knowledge in practice that will stimulate the innovation needed to realize transformative goals.

ここ10年の間でレジリエンス(resilience: 苦難からの回復力)という概念は、非常に広範な分野において重要なトピックとなり、経済学や政治学から建築学や都市計画、心理学、人口学まで多くの分野に影響を与えている。これは、原因は様々であれど、世界の激変に対処・適応するための政府や個人の能力に関心が高まっていることを反映している。苦難や災害からの復興は我々の未来にとって重要であるものの、持続可能な形で復興には相応のイノベーションが必要となってくる。まさしく、言うは易く行うは難し、である。

日本において、今、レジリエンス(resilience)といえば、それは2011年3月に発生した大震災からの復興という事になる。今回の大震災はこの国が数十年にわたって当たり前のように受け入れていた政策決定や社会規範を再検討するきっかけとなった。復興はよりレジリエント(resilient)な社会を形成する良い機会になるという見方もある。しかし、復興がどの方向性に進むべきか、また、レジリエンス(resilience)そのものが何を意味するか、自明ではない。目前の要望に応え復旧を急ぐか、より深い変革を敢行すべきか、決断力が問われている。復興が進むにつれ状況が錯綜し、変革はどこでどのように組み込むべきか、不確実性が増している。これらの問題はグローバルな気候変動から直接的に引き起こされているわけではないが、近年世界中で頻発している暴風雨や洪水、それらに伴った停電といった極端な天災によってもたらされるような問題と多くの部分で共通している。

現在、評価と行動の間に大きな隔りがある。問題への理解は徐々に進んできているが、解決策についてはまだまだはっきりとしていない。今年で3回目となる本年の環境イノベータシンポジウムでは、実際の行動を起こすにあたって、また、レジリエンス(resilience)の構築に関して、不確実性を減らすべく革新的な手法を試みている研究者と実務家が一堂に会する。答えは唯一ではないであろうが、実践に伴う知識の蓄積が、変革に必要なイノベーションを促進すると考えるからである。

Organizers and Session Chairs



Wanglin Yan

Professor, Keio University, Japan

Leader of the Environmental Innovators Program at Keio University

Director of Center for Climate Change Adaptation

Professor Yan graduated at Wuhan Technical University of Surveying and Mapping in 1982 with a bachelor degree of Engineering and earned his Master Degree in 1989 and Doctor Degree in 1992 at the Department of Civil Engineering, the Graduate School of Engineering, the University of Tokyo. He is a specialist in Geographic Information System and Science and contributed to the design and re-construction plan for Sichuan in China after the city was strike by a massive earthquake in 2008. His research work includes examining the degradation and conservation of the grasslands and making adaptation plans on the Tibetan Plateau and Mongolian Plateau in China.



Hideyuki Mori

President, The Institute for Global Environmental Strategies (IGES)

Mr. Hideyuki Mori is a graduate of the School of Engineering, Kyoto University. He joined IGES in 2003. Prior to joining IGES, he served as Environment Specialist at the Asian Development Bank, Senior Environmental Coordinator of the United Nations High Commissioner of Refugees, Director of the Office of Research and Information at the Global Environment Issues Division of the Environment Agency of Japan (present Ministry of the Environment) and as Portfolio Manager of the Division of GEF at the United Nations Environment Programme. He has served as the President of IGES since 2010.



Masataka Watanabe

Project Professor, Keio University, Japan

Chair of the Asia Pacific Adaption Network (APAN)

Professor Masataka Watanabe received his Bachelor and Master degrees in Environmental Engineering from Kyoto University in 1968 and 1970, respectively and Ph.D. in Civil and Environmental Engineering from MIT in 1975. He has received several awards and prizes for his contributions to science, including the Tien Shan Prize from China in 2003. His main research interests concern ecosystem modelling, bio-geochemical cycles and science for sustainability. He contributed to UN Millennium Ecosystem Assessment as a Coordinating Lead Author, and is currently working on development of sustainable adaptation systems in China and Mongolia.



Hikaru Kobayashi

Professor, Keio University

Mr. Kobayashi joined the Ministry of the Environment (formerly the Environmental Agency) in 1973 and was instrumental in bringing the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCC) to Japan in 1995. He managed international negotiations for the Kyoto Protocol and helped draft the law created to promote prevention of global warming. He served in various posts, including Director-General of the Environmental Policy Bureau, before being appointed to the position of Vice Minister of the Environment in 2009. Mr. Kobayashi retired from public service and took up his present post at Keio University in April 2011. He has authored several books on Japan's experience with pollution as well as on eco-housing.



Yasushi Ikeda

Professor, Keio University

Professor Ikeda graduated with a PhD from the University of Tokyo, Faculty of Engineering. After working for several years with the world-renowned architecture and planning office, Maki and Associates he established his own design firm, IKDS, in 1995 and began teaching at Keio University in 1996. His research focuses on innovation in construction technology and fabrication. Recently he has worked with his students in Tohoku to consider how architecture can be used to take on social as well as physical challenges that emerge after a disaster.



Will Galloway

Project Assistant Professor, Keio University

After completing his Master of Architecture degree from the University of Manitoba in Canada, Will worked for several years in the UK and in Japan as an architect before completing a PhD in urban planning at the University of Tokyo in 2008. In 2006 he co-established the architectural practice “frontofficetokyo”, which has won several awards including the International Architecture Award in 2012. Following the disaster in Tohoku in 2011 he became one of the founders of the Tokyo chapter of the design-led disaster response organization, Architecture For Humanity. His field of expertise is sustainable architecture and urban planning.



Shinano Hayashi

*Deputy Director, Natural Resources Management Group,
Adaptation Team, Institute for Global Environmental Strategies (IGES)*

Shinano Hayashi is currently deputy director of Natural Resource Management Group (Adaptation Team) at the Institute for Global Environmental Strategies. His major interests are climate change adaptation strategies in the agriculture sector and Alternative Risk Transfer (ART) schemes for risks caused by natural disaster and climate change. Currently he is conducting social and economic analyses for reconstruction following the 2001 Northeast Japan Earthquake/Tsunami and works on proposal regarding local economic rehabilitation and vitalization by implementing various financial schemes.

Keynote Speech

Andries Jordaan

Director, Disaster Management Training and Education Centre for Africa
University of the Free State, South Africa



Dr Jordaan graduated with a BSc Agricultural degree at the University of the Free State in 1977 and an Honors degree in agricultural extension at the University of Pretoria in 1981. He worked as an extension officer for the department of agriculture and later join the private sector as an entrepreneur and farmer until 2000. He joined the academia in 2000, and since then completed the Masters degree and PhD in Agricultural Economics at the University of the Free State. Dr Jordaan worked in several African countries and has vast experience of the challenges and opportunities on the African continent. He was and still is project leader of several research projects with a focus on risk assessment and disaster risk reduction. He is currently the Director of the Disaster Management Training and Education Centre for Africa at the University of the Free State in South Africa.

Note, the following text is made from a recording of the event and has been modified for the sake of clarity.

Building Resilience in Africa Through Transformation and a Green Economy

Thank you, Mr. Chair, for inviting me here to Japan, and to Keio University. It's really a big privilege to be here and I really hope that this is the beginning of future contact, future linkages, and strengthening the linkages between Asia and Africa because we need each other. There are so many challenges that we're facing and we cannot do it alone.

In preparing this keynote speech I started with some technical aspects, and as I went on I realized that when talking about transformation in Africa, we cannot really talk about transformation if we don't also address the issues that are hindering transformation and that's hindering development at this stage. So with regards to the structure of my speech, I will focus on the first part, on some of the barriers of development in Africa. Then I will also look at the opportunities that we have in Africa. I think there are a lot of challenges and opportunities for scientists to get involved, to start with a green economy, with green agriculture, green industry. We have the opportunity since we are very undeveloped now that we can start with the right base, but the base where we start from is very disadvantaged at this stage, and I'm going to share with you some of these. And in the end I will conclude with what we can do as scientists and what we should do.

I think we all agree, and I'm not going to waste much time on this, that we as humans influence the whole earth, below and above the earth, and for many years we as scientists, we sort of separated the environment and humanity, but we have an impact wherever we go.

We're talking about change, about new innovations, new things. We need to expect that there will always be a risk, and one of the philosophies that I really support is what Peter Bernstein said in his book, *Against the Gods: The Mastery of Risk*, is that "*The revolutionary idea that defines a boundary between modern times and the past is the mastery of risk: the notion that the future is more than an act of the gods and that men and women are not passive before nature.*" This in itself highlights one of the barriers that we have in Africa with culture. When something is going wrong, traditional people in many cases blame god for whatever is happening or they blame something for what is going wrong. Nowadays people blame climate change for everything instead of taking responsibility for what we do the environment. So that's why this philosophy is a very important one for me.

So we all agree that if we're talking about resilience is that we as humans are not passive before nature. We need to take responsibility for our own action, and this is quite interesting in the literature, that the difference between



the development in Asian countries after colonialism, after the wars, is that they took their future into their own hands and they stopped blaming the past; whereas, in most of Africa still, if you go there, those of you who have exposure, colonialism and all other things are blamed for our current failures and we need wherever we are to take responsibility into our own hands and build their own future.

We also need to overcome the current barriers to growth. We need to transform, and I'm talking specifically in Africa now, at all levels, at the social level, governance level, science level, in education, in the environment, in the economy, we need to think new. We need to think new about economic models. We need to ask, is our current economical model working? Is it working for us? What new solutions can we find?

And then the question is, maybe we are too involved with survival, with everyday survival. How do you tell a person in the bush, in the forest, who's dependent on the wood to make a fire to cook his or her food, how do you tell that person you cannot cut trees because you need to preserve the forest for the future because their survival depends on that tree. So that is one of the challenges that we as scientists face. How are we going to address and implement a green economy in a place like Africa where people are more involved in everyday survival and they cannot think about the future at this stage.

So just this is repetition for everybody. I'm not going to go through it. The green economy, the definition according to UNEP. It includes everything. It's linked to sustainable development but also with emphasis on the environment and how we as humans interact with the environment. But in order to understand the challenges in Africa, we need to know from what base we are planning, and we have certain challenges. I'm quickly going to name some of them.

The first one is land-use planning is a big problem. There are few countries who have proper land-use plans in place. The lack of good transport systems. If you want development you need to have proper transport systems. Poverty is another big problem. Unemployment. Most people in Africa are unemployed and depend on subsistence agriculture, so that's a good challenge. We have, our workforce is largely uneducated. Food security is a problem in most of African countries. Safety standards. For those of you who are in the construction business, there are no safety standards – I will show you a few pictures of what's going on there.

We have poor, in general, poor infrastructure. And I'm excluding, there are certain spots of excellence, certain countries, where there is good infrastructure, et cetera, but in general in Africa infrastructure is a big problem. Population growth is both a problem but also an opportunity that we can use. Cultural beliefs is a barrier to development to a large extent. Traditional and outdated technology.

While naming all of these I think you in the environmental innovation field think of the opportunities that we have. We start from this base and what difference we can make by just applying simple and basic knowledge. Then the things that are really bothering and limiting growth and development in Africa is civil unrest. We have poor governance. There is nepotism. We have conflicts in Africa. And we have corruption in many countries in Africa. We need to overcome these barriers even before we can start thinking of developing a green economy or new innovations. If we are not going to resolve these problems, we will not be able to develop properly. So one of the challenges, I'm going to say something about a few of these challenges, one is population growth, which is both a challenge as well as an opportunity, as I've said. It's expected that by 2015 there will be 27 megacities in the world of more than 10 million people. Most of these cities will be in the developing nations where there's a conflict of cultural beliefs, conflict in religion, and where the majority of people are very poor. So that will pose a specific challenge for us as developers.

How are we going to design those new cities to make sure that we not only create nice living spaces, et cetera, but also to reduce the potential of these different conflicts? The sub-Saharan Africa population will grow from the current 800 million to 1.4 billion by 2030, 2030 is 15 years; hopefully I will still be alive by then. The youngsters here will be in their middle age, so it's just around the corner. By 2025, one quarter of the world's youth will living in sub-Saharan Africa. Can you think of the potential resource that we have in Africa? On the other hand, population growth is also an opportunity since we have the market where we can sell our goods and we have people who can produce, and that is how we should look at that. This just an example of some of the agriculture, of the technologies applied. These are pictures that I took last year in Lesotho and this is most common all over Africa

where they still use draught power for cultivation, et cetera. So technology in general is still much traditional. It's mostly subsistence. Yields are very low. For example, commercial farmers in South Africa receive under irrigation 15 tons of maize. In Zimbabwe, yields were, before the land reform program in the early 1990s, farmers received under rain-fed agriculture 12 to 14 tons per hectare. Currently, under subsistence agriculture the yields are less than 800 kilograms. So you can see, if we compare food production and yields in terms of food production, for the past 30 years food production per hectare stayed stagnant in Africa. It didn't increase to the same extent as in other developing countries.

Farmers in general don't use fertilizer and chemicals. So in a sense agriculture is already green in Africa because we don't use chemicals, we don't use tractors, and we don't use fuel. The problem is the yields are so low that we cannot continue. Farmers lack an economy of scale. There are imperfect markets because they have to compete with international farmers. They do not have a good farming market structure. But we also have the extremes where we have mega-companies, big companies from all over the world, from China, from the Middle East, who are investing in agriculture and are putting up huge agricultural, commercial agricultural farms. So you will find in a country this large group of subsistence farmers but also a few big companies who are producing food in those specific countries. And then the other challenge is that African farmers have to compete with highly subsidized farmers from the developing world on the global market. And these are some of the challenges we need to overcome.

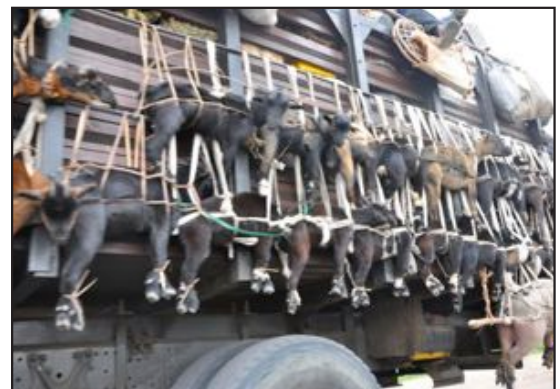
***We need to
address the policy
distortions, and
that includes
international policy
distortions.***

These are some pictures of agriculture. The top-left one is a picture of a new irrigation scheme for farmers in the Sudan where about 70,000 households were displaced because of the building of the new Merowe Dam on the Nile River. And they were put on an irrigation scheme of 1 million hectares in northern Sudan. So the top-left one is an example of one of those small farmers. Currently that scheme is working quite well. The top-right one is another picture of a stock farmer in northern Africa. The top-left some farmers busy with harvesting in Ethiopia, and the right-bottom in Kenya some of the stock farmers. So you can see everything is still very traditional. But we also have high-tech commercial farmers. And we can develop Africa to produce much more food by increasing the low and stagnating yields of farmers.

We need to address the policy distortions, and that includes international policy distortions. We have weak institutions in general in Africa. There is poor infrastructure. And then the property rights system in Africa is also one of the problems that needs to be addressed. We need to think innovatively on the property rights systems. We all know about the impact of communal farming on the land, on our grazing, the "tragedy of the commons" I think is common knowledge amongst all of us. We need to address these things in order to preserve our environment. Maize is one of the staple foods in Africa - this photo is taken on a maize farm. With rain-fed agriculture, with about 700 millimeters precipitation a year, those farmers' yields are more than 10 tons per hectare. So it is possible to produce enough food for Africa - we have the resources.

One of the other factors that we need to address is the free flow of goods in Africa. Trade agreements need to be sorted out. There are certain trade restrictions. The traditional transport systems are still current in most of Africa. We need to address our transport systems. This is for the transport guys, for the engineers, another challenge, what are we going to do? Our roads in general are poorly maintained. Railways are nearly nonexistent and demolished during civil wars. We have a few ports that can handle large volumes. There is insufficient border control. I spent a year or so ago some time at the border between Namibia and Angola to see what's going on there, and there were trucks standing there for longer than a week, suffering to get through the border there. We cannot trade, we cannot have free trade, we cannot have development if private business cannot transport their goods over the borders. So we need to address that. Corrupt officials is one of the problems. If you travel... I personally think, and there is actually some literature on this, that there is a negative correlation between the number of roadblocks and development in any country. The lower developed, the more roadblocks you will find. In some of these countries you travel for 50 kilometers and every 50 kilometers you are stopped and half of the time by corrupt policemen who want a bribe for you to get through. These things restrict flow. It restricts development. It restricts investment. We need to address this before we can start thinking of high technology, innovations, et cetera, et cetera.

These are some examples of different transport systems. I think the donkey is still the main transport system, especially in northern Africa. There are other challenges also. I think that animal rights groups would not like the top-left photo with animals and goats strapped to the side of the truck, but these are common things that you see all over Africa - overloading. We need to address these things. There is a shortage of transport because few people are willing to transport goods in different African countries, and then on the left you can see the rows of trucks waiting to get over the border. So the free flow of goods is key to development. We already learned some of the lessons, and Singapore and Dubai are examples where they managed to stimulate their economies because of the free flow of goods in and out of those countries. But there are examples of road construction in South Africa where roads and rail systems are upgraded by the private sector in certain areas. For example there is the example in Liberia where private companies are busy repairing railway lines to move ore from inland to the ports.



Nairobi traffic used to be, well it is still a nightmare there, but 40 years after independence they only started building new roads. So the old roads are really not planned for the urban city and for the numbers of people in those cities. South Africa saw a major upgrade of our road and infrastructure system prior to the World Cup but we needed the World Cup to waken government so they would start investing. At the same time Algeria built new roads with the assistance of China, so there are a lot of new initiatives going on but what have learned that what we need are public-private partnerships in order to do these things.

Construction, not only road construction, is key to development. African countries in general have limited budgets for building. At the same time building and safety standards are not in line with international standards. There is also no long-term and visionary planning. This is a problem because we expect in South Africa that we will be out of water in ten years' time. And we know, if we want to plan...that we should get water from the Zambezi and from the Congo River if we want to sustain our economy. We depend on crisis planning, but, as I've said, things are changing, and in general China played a very important role all over

We cannot build a continent, we cannot even think of a green economy while we are sitting with such a large pool of youth who don't even go to school, who don't understand what green economy is, who just see their environment as a source of survival.

Africa in the construction of most of these new roads, new buildings, et cetera, et cetera. The problem is all this work, construction work, are allocated to the lowest bidder and there is a question about the standards of some of these buildings, of some of this new construction work because people are saving money and they're not building according to standards, and they're also not building it according to principles of a green economy. So the challenge is, should we continue or should we stop and say, now let us do this properly? But then, we don't have the funds to do it that way, and maybe we also don't have the engineers and architects who can do it. But I think as scientists, and in setting like this conference, this is where we can contribute to seriously ask these types of questions. What are we going to do?

The other challenge that we have is education and youth in Africa. Forty-six million, 50 percent of our children, don't enter a classroom in sub-Saharan Africa. Two-thirds of these are girls, and the reason for that is normally lack of

facilities, lack of well-trained educators, long distances in the rural areas to schools, proportionally large spending on military and security instead of education by governments, general conflict, and finally family labor. These are some of the issues that need to addressed in education. But we cannot build a continent, we cannot even think of a green economy while we are sitting with such a large pool of youth who don't even go to school, who don't understand what green economy is, who just see their environment as a source of survival.

These are the challenges that we need to address.

So we also need to think of innovative education methods. How are we going to reach these young children in the rural areas? What can we do? Remember, there is no internet access, there is not a world wide web, and wherever it does exist it is - except for I think South Africa and Nigeria - extremely slow. I have students all over Africa and their biggest struggle is to submit assignments, to get information from the internet. So, while children are the most important asset in Africa, we need to provide a good education to them. There are certain areas where they do receive such a thing - remote areas, where good work is done

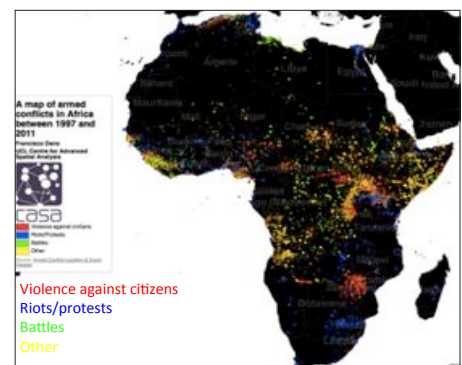
to educate children. For example I found in northern Sudan in remote areas, the children are going to school. ALL the children. In spite of the negative impression by our world of northern Sudan, more than 80 percent of the children there go to school. But it's a challenge that we need to address all over Africa. Similarly while adult learning is taking place, more than 70 percents of adults in Africa are illiterate. So we have a problem with a literate workforce; you cannot build the economy if you don't have an educated workforce. The other thing is I want to say something about is international aid because people always want to help, but how are we going to help? Foreign aid creates dependency on technology, on the industries, on the culture, on the capital, and ideologies. In providing foreign aid we must be sure that we don't create a dependency syndrome which is already prevalent in most countries in Africa. It creates a special umbilical cord between the donor country and the receiving country, Aid eroded self-confidence, creativity, and the pride of both the citizenry and leaders. Aid-dependence has eroded and undermined the moral authority of African leaders to govern and foreign aid led to a situation where African countries failed to set their own pace of development. because in many cases aid was focused on the priorities of the donor countries.

We need to find innovative ways of providing aid to Africa for development in Africa.

Political leaders and their families are amongst the richest people in the world in spite of the fact that they are coming from poor countries. Corruption and nepotism see the development of a small super-rich group and the majority of the people stay poor, which is why you will find the Gini coefficient is the highest in most of the African countries in the world. We have poor service delivery from government, especially to the poorest people - corrupt officials follow the example of the political leaders and in the end we have labor unrest and civil strife.

These too are some of the challenges that we need to address and sort out.

Wars, conflict, and civil unrest are nothing new in Africa. It's a common thing. It's because of power struggles between leaders mostly involving struggles over resources, then it goes over to ethnic and religious reasons. But originally, normally, conflict starts over resource arguments, whether it be diamonds in the Democratic Republic of Congo (DRC) or oil in Sudan, it doesn't matter; it's about resources and power in the end. So we have labor unrest, poor service, and a dearth of democracy in most of the African countries. All of this results in high death tolls, internally displaced people, which creates no potential for development, no production, including food production which is a problem in certain war-torn areas. Nobody will invest in countries like this. This is just an example of the map of conflict between 1997 and 2011. You can see it's happening all over Africa, we need to address that.



But all is not doom.

Africa is still a continent of opportunities, and potentially where we can start from the right footing is in developing a green economy, because what we have is natural resources. We have agricultural potential for food production - if we can exploit the agricultural potential of Africa, we will be able to feed the whole world. We also have institutions that can be transformed. The basic institutions are there - we just need leadership to transform them. Africa is geographically well-located between the east and the west. We can export and import stuff from anywhere in the world, and it seems that climate change might not have such a negative effect on Africa as it will have on the Northern Hemisphere. And then we have tourism opportunities. So think about all the potential innovations that we can include in these different fields. Just quickly, if we look at agricultural commodities produced in Africa: we have cocoa, coffee, corn, cotton, dates, fruit - which we export to Japan - rice, oil palm, peanuts, rubber, sea salt, tobacco, vineyards, we have amongst the best wine in the world for some of you who don't know that yet, and wheat and corn.

Bringing this back to climate change, if you look at this map you will see the red dots are the areas where they expect a reduction over the long-term because of the climate change in corn and wheat production, in cereal production, but in the majority of Africa we can expect a positive increase in yields because of climate change. And some of those red areas, especially down there in Mozambique, Zimbabwe, northern Namibia, and Angola are not currently well-known as big wheat-producing areas, so the net effect will be that we will be able, even with climate change, to produce more food than today. We also have minerals. I'm not going to say much about this. I think all of you know about the mineral wealth in Africa. We need to exploit that.

Energy is another very important thing for the future and it's at the core of any green economy. We have plenty of resources, yet less than a quarter of our population has access to energy, to electricity. Six hundred million people have no access to electricity, so that is something that we need to think of. We need to think innovatively of how we are going to generate and to distribute energy in the future into Africa. This is a map of some work that's currently going on. In Africa, if you look, these are major construction projects going on currently down here, railroads going on there, that's a high-speed railway line being currently built there. This is the distribution of water with new artificial rivers to distribute water and generate new irrigation schemes. Here in central and in East Africa we have roads. This indicates construction of big roads there. And also to link East and West Africa, construction of power lines, construction of highways, as well as the construction of high-speed railway lines, which will unlock the whole of central Africa's potential to import and to export. These projects are in planning, and some of them are in different phases of construction already. Things are happening and we have the opportunity as scientists to become involved in the design of these projects to ensure that it is green.

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So the question now is why is it that some countries succeed and others not? What can we learn from others in order to transform? From the boom of the Asian economies over the past 20, 30 years we know about the need for an educated and healthy workforce. We need timely investment in infrastructure, extension of governance to the people, access to the global economy, productivity and a good work ethic, the free flow of goods, promotion of entrepreneurship, and especially SMEs, small and medium businesses. We must limit all the import/export and all their restrictions. We must have a flexible labor market, and we should promote tourism. And then also we need to have well-defined land ownership rights and regimes.

I just want to say something about the Singapore paradox. It was promoted by Brigoglio as a way to compare different countries. On this axis you have the nurtured resilience of a specific country - in other words, on this side you have countries with a lot of natural resources. On that axis you have inherent vulnerability. And your worst case scenario is there where you have no natural resources, no inherent resilience, but also very poor governance. Examples of those in Africa are for example Swaziland and Lesotho. On this axis you have the self-made countries, which I think Japan, Singapore, those are excellent examples of self-made countries who are inherently vulnerable with a low resilience, but because of the right policies, of hard work, et cetera, et cetera, that is a self-made country. On this level we have the prodigal son countries. Zimbabwe is currently one of those where they have all of the resources, yet they are inherently very vulnerable at this stage.



So the things that we must stop doing in Africa. We must stop with corruption. We must stop with nepotism. The politicians must stop with the paranoia of having these security forces and start putting money and investment into the youth for education. We need to stop enriching small sectors of society but looking at the poor. We need to address the power hunger of politicians. We should stop the centralization of assets and nationalization of assets. We must promote private sector investment. And then we must stop the fighting and the killing in Africa. There are so many people dying because of these civil wars and stuff; we cannot continue with this. And we should stop blaming the past for current problems. And then also we should stop with our dependency syndrome, of being dependent on donor money and other countries. We need to take our future into our own hands.

What we need to acknowledge is that a green economy is linked to economic growth and global sustainable development, but the current economic models fall short of expectations.

When it comes to transformation to a green economy in Africa there are different opinions. Some people are against it; others are with it. Scientists normally argue with it, but practitioners on the ground and some politicians argue, in fact, in spite of the fact that we signed all the agreements, the Rio, we participate in the COPs, et cetera, et cetera. Behind the scenes the argument is, why should we pay for the mistakes that the first world made? Why should we implement expensive economies or expensive technologies today in order to be green while the US and China still continue polluting? That's a question and it's a serious question that we need to consider; we need to address that. We cannot just ignore it. And in some cases it's also a valid question.

So what do we need? Innovation. What are the pre-requirements for that in Africa? It must be simple and easy to understand and implement - remember the large number of people who are illiterate in Africa. It must be affordable, it must provide a competitive advantage, and we must have a centralized use for new technology. At the same time we have certain areas in Africa where there are energy sources and we can tap those sources without linking into expensive national grids, but we need to develop technology to make it work. New innovations must also include systems, and institutions and go beyond the technology alone - we need new thinking at all levels, at the political level, education, and we need to go beyond the current survival mode in Africa.

We are already making strides in Africa toward a green economy. There we have in May 2009 the African Ministerial Conference on Financing; June 2010, also ministers who agreed on green economy; September 2010, the African Biodiversity Conference; again in 2010... So you can see a lot of things are happening toward developing Africa to a green economy. What we need to acknowledge is that a green economy is linked to economic growth and global sustainable development, but the current economic models fall short of expectations. From the Rio 2010, "*The Future We Want*" document, we all know about that. The green economy is just one way to achieve sustainable development. Many believe that the green economy is key to sustainable development and uplifting people out of poverty, and in order to do that we have to acknowledge the call for a green economy is costly and will involve new systems. Institutions of higher learning, universities, colleges, and research institutions, will play an important role towards making it real.

Just a few notes on foreign aid – I'm nearly finished. We need to stop the handouts. It's okay if we provide disaster response and disaster aid, that's something different. We need to link aid to actual needs in the receiving countries. We

need to have access to markets. We need to level the playing field in the global markets, and the aid and support that we need – and this is important in the context of this conference – is knowledge and connectivity. We need to help Africa to nurture its indigenous knowledge. We need to exchange researchers, students, lecturers. We need to have international exposure to African specialists. And we need to have better connectivity to the rest of the world. And I think this conference provides an excellent opportunity where we can start creating that. So all of you are involved in different networks. Develop and nurture those networks with Africa because that is valuable to African scientists and to the development of Africa.

So what can and should we do? Actively research new ways of doing things, including new technology. We need to take on action-based research, in other words, implementing while learning. We need to listen to the needs of society. We need to consider the impact on the environment. We need to influence policy-makers. Advocate for a green economy and environmental innovation. We need to create global linkages. And firstly, as a continent we need to get the basics right: human rights, democracy, et cetera. We need to get that right. Otherwise, we will not have a green economy and development in Africa.



Yan: Thank you, Prof. Jordaan. So I'd like to accept several questions from the audience. It's a really good chance for us to directly listen from this distinguished professor from Africa. Anybody? I think here we have so many participants who are interested in or even working in Africa. Prof. Ye?

Qian Ye: Thank you very much. I'm Qian Ye from China, Beijing Normal University. The green economy, or now we call it green growth, it seems it's not... We don't have the same kind of model. We can't think about it the same way because different countries must have different development models. For China and Japan, because they are rich, so they can green their deserts and what we may see as waste, they see as green growth. Also, size matters. You mentioned for instance the examples of Dubai and Singapore, but they are both small and they can handle the challenge. But for China and Africa it is very hard. So I wonder what do you think is the green development model in Africa? Secondly, as African, I would like to ask you, do you think that unifying the whole of Africa is a good idea? I did a project in Africa, and what we found is that Africa with its 53 countries, well sometimes the countries are too small and they don't have a good social infrastructure, and the social capital is wasted.

Jordaan: To answer your question first we have a saying, "*horses for courses*", meaning that one solution is not going to work for all countries, and that's why I tried to explain the conditions in Africa and the challenges. It's totally different than the conditions in Asia, in Europe, in the US. We need to find different models, different ways of doing things because we are, in terms of development, in terms of technological development, many countries are where you guys were 40, 50, 100 years ago, so our base from where we plan is totally different, and it's different from different countries. So that's why we need to think new about this, and that's why also I'm bringing international aid into this, because my experience is that donor countries in all cases are developed countries with money and they want to impose their ideas, their development, and their lessons onto the African situation where the conditions are totally different. So we need to understand the conditions in a specific country and then develop that country from that basis. That's why it's important that we as researchers, as scientists, exchange ideas, because in the end I am the one who's going to advise people in my country because I know the local conditions, but to the input and the support from international experts, instead of what happened in the past you will have international experts going to a country, advising that country, without having local knowledge of what's going on in the country. So my answer in short is we cannot treat all countries the same. We cannot look at the green economy through the same lens in different countries.

Your second question again, just... Unifying Africa? Even though it's a dream, I think economically we need to limit the movement of goods, the movement of people, but it's not going to work as long as you have certain islands of wealth in a sea of poverty because what's going to happen is that you will attract all the problems in the poor countries, they will go to the richer countries, and they will not help uplifting those countries. Instead, they will have a negative effect on the economy of those countries. The other thing is, the fact of life is, that we have different cultural groups, we have different leaders, African leaders of countries. As long as Africa is divided, it's a power struggle. And while the economists would like it, I don't think the politicians will ever go that way. So in reality I don't think it's possible

Andrew Brose: You showed a couple images which kind of were home a little bit for me, with the trucks transporting the coal and the animals on the side of the trucks. Something I've seen a lot from my experience in East Africa is there are no facilities to process materials. So coming out of DRC or Rwanda, it has minerals, you have maize, you have animals, which are transported raw, and there's a lot of waste going into the fuel, going into transportation costs, because they're being shipped off to somewhere else. Have you seen any opportunities to develop processing, either in South Africa or any other projects you've worked on?

Jordaan: Yes, well, that's the irony of it. We have all these raw materials. We're exporting them to the East, to Europe, and we import the final products back. Basically, it's an historical thing. I think historically there were no industries developed in Africa, so the developed world to a large extent depends on the raw materials from Africa, and I'm not blaming the past now for that, and the industries were developed in the development world. So to start development at the source is what we need to do. We need to start developing our own industries, processing our own goods, because that will create jobs. One of the challenges that we have is that our labor output is amongst the most expensive in the world because our productivity is so low, because we have an uneducated workforce. So again it starts with education. You cannot have high-tech technologies and processing if you sit with the majority of your workforce uneducated. So for me, the only way that we're going to change this in the long run is to educate people, and then you can start with these other ideas.

Session One

Data, Tools, and Narratives for Adaptation in Northeast Asia



Qian Ye

Professor, Beijing Normal University

Dr. Qian Ye is Professor for climate change impacts at Beijing Normal University, deputy general secretary of the Chinese National Committee for IHDP and leading scientist of the Social and Economic Impact Assessment Group at Beijing Meteorological Bureau. He is executive director of the newly established IHDP core project, IRG-Project and member of the Scientific Steering Committee. His current research interest is focused on the role of social and ecological dynamic system in dealing with climate change and its impacts.

Visualization and Decision Support for Climate Reduction

The world is currently faced with many complex challenges. Past development patterns cannot be simply continued and new development patterns need to be invented under emerging risks such as increasing aging population, slow economic growth aftermath of the global financial crisis.

In this presentation, a concept and framework of a human-computation environment, i.e. a setting combining human thinking with computer based information processing will be discussed. Moreover, in-depth studies of relevant cases, such as the Japan Triple disasters, will be used as an example to demonstrate this concept.



Renchin Tsolmon

Professor, National University of Mongolia

Dr. Tsolmon Renchin holds a Ph.D. degree in Environmental Science and Remote Sensing from Chiba University in Japan. Prior degrees were earned at the National University of Mongolia (M.S.) and the University of Irkutsk (B.S.) in Russia. She has done her postdoctoral research at Pennsylvania State University and NASA, Greenbelt, Maryland, U.S.A. Currently she is a Professor at the National University of Mongolia and head of the NUM-ITC-UNESCO Remote Sensing and Space Science laboratory. Her research interests include application of Remote Sensing and GIS to environment, Climate Change and Natural Resource management.

GIS and Remote Sensing for Monitoring and Analysis of Adaptive Development in Mongolia

Mongolia is vulnerable to climate change due to its impacts on water and forage resources, and also transitional economy. Climate change indicate that Mongolia will continue to experience dramatic changes in the seasonality, amplitude and variability of temperature and precipitation regimes. Climate change and its impact on Natural and Social dimensions is increasing past decades in Mongolia. Mongolia currently has the concentration of areas of rapid land-cover changes, and in particular dryland degradation and desertification. Resilience vulnerability and adaptation of coupled pastoral social-ecological systems are changing due to climate change and market forces.

It is important to integrate climate change adaptation with sustainable development, applying Geoscience technology and innovation for green economy. There is need to apply GIS and Remote Sensing for monitoring and analysis of adaptive development in Mongolia and to improve adaptive capacities against desertification and climate change.



Sinkyu Kang

Professor, Kangwon National University, Republic of Korea

Professor Kang graduated from Seoul National University in 1990 with a bachelor degree of Physics and in 1995 with a master degree of Environmental Science, and in 2001 with a doctor of Ecology, followed by 3-yr post-doctoral research at the University of Montana, U.S.A under the supervision of Prof. S. Running. He is a specialist in ecological modelling and remote sensing and is leading the Korea-German TERRECO International Training and Research Group, together with Prof. J. Tenhunen at University of Bayruth, Germany. His research work includes development of remote sensing, biophysical modelling techniques on terrestrial vegetation, primary productivity, and land surface evapotranspiration.

Assessing Socio-ecological vulnerability in Mongolian grasslands

As illustrated by Adger (2006), vulnerability is degree to which a system is susceptible to and in unable to cope with adverse effects, the key parameters of which are the stress to which a system is exposed, its sensitivity, and its adaptive capacity. Mongolian socio-ecological system has been exposed to new stresses from ongoing climate and socio-economic changes for the last several decades. After relatively wet period until mid-1990s, climate becomes drier and warmer in Mongolia. Livestock populations and mining activity increased since economic regime shift in 1992. In this presentation, we will try to identify major components of assessing socio-ecological vulnerability in Mongolian grasslands and then, demonstrate our case studies to monitor and evaluate the component variables. Strength of the impacts and ecosystem responses might differ across regions depending on characteristics of regional climate and socio-ecological regimes. For examples, eastern Mongolia showed greater variability in precipitation, soil moisture, land surface temperature, and spectral vegetation index (NDVI) for a period of 2000-2011. NDVI generally decreased in dry steppe but showed increased patterns in steppe and forest steppe regions. Sensitivity of primary production to soil moisture was higher in dry steppe. Satellite-based analyses on lake surface area change indicate that in overall lake area decreased in Mongolia since 2000 but Khangai forest steppe region showed increased lake area. Though regional water balance plays important roles in supporting sustainable vegetation growth and livestock farming, our understandings on effects of climate change and anthropogenic water use are still limited. We will also present species level information on spatial distribution patterns of grassland functional groups and *Caragana* spp. across different regions of Mongolia. For examples, *Caragana* spp. dominance was strongly relevant with livestock grazing and fire disturbance regimes. With higher grazing pressure, *Caragana microphylla*, *stenophylla*, and *pygmaea* were co-existed but in regions with frequent fire disturbance, *Caragana microphylla* was mainly dominated. C4 plant was more frequent in dryer regions but diversity increased along with precipitation gradient. We will summarize our pieces of findings and attempt to build an integrated scheme in which socio-ecological systems of Mongolian grasslands respond to their observed stress variables.



Akihiro Oba

PhD Candidate, Keio University

Akihiro Oba is currently pursuing his PhD at Keio University Shonan Fujisawa Campus where he is focused on adaptation research in Mongolia.

Framework of Support Systems to Bridge the Gap between Policy and Practice for Early Adaptation to Extreme Weather in Mongolia

Note: In some cases abstracts were not available at the time of publication. For those who are interested the presentations can be found as pdfs online at the following address: <http://blobbityboppity>



Balt Suvdantsetseg

Assistant Professor, National University of Mongolia

Dr. Suvdantsetseg graduated from the National University of Mongolia in 2005 with a bachelor degree of Applied Physics and Ecology and a Masters degree in Remote Sensing and GIS in 2007. She earned her PhD from Keio University in 2012. Recently, her work focuses on ecotourism management planning in remote areas of Mongolia, participatory adaptation approaches for development of livelihood in small communities, and Participatory Geo-spatial approaches to investigate desertification processes in real sites.

Innovative climate change adaptation and practical action for Gobi region of Mongolia

Under combined pressure of climate change and intense human use of natural resources, the natural environment and human lifestyle of Mongolia has rapidly changed. The most impacts of climate change are critically affect Gobi desertification, biodiversity loses, poverty of nomadic herders livelihood, loses of livestock number, decreases of water sources, degradation of pasture rangeland and migration from rangeland to urban areas so on. While climate change is requiring great challenges and adaptive solutions on the all spheres of human environment, and development of policy strategies for the local to national level to strengthening resilience on its impacts and implications. The main aim of this study is to investigate the most problematic local issues and its effective risks for the real critical local sites and develop the best adaptive solutions and then implement actions in practically to reduce the risks of climate change and unapproved resources application activities.



Yingjiu Bai

Project Associate Professor, Keio University

Yingjiu Bai is an urban climatologist, with a PhD degree (2001) from Keio University. From 2001 to 2011 she taught climate science in urban design, urban sustainability science and related environmental sciences at Tohoku University of Community Service and Science. Since 2010, she is a project associate professor at the Graduate School of Media and Governance, Keio University, and works on the Program to Reform the Social System for Creation of a New Society Adapting to Climate Change: Green Society ICT Life Infrastructure. Her main research interest is the evolution of urban climate within the context of climate change and mitigation and adaptation strategies for cities.

A GIS-based approach to adaptation to regional climate change for decision-making by local government: Case study of Kurihara in Miyagi Prefecture, Japan

Recent years have seen a number of weather events related to climate change cause large loss of life and a tremendous increase in economic losses. There is an increasing need to take extensive and effective adaptation measures at the local level, for local leaders in government to shift or lessen known vulnerabilities to climate change. This study has two aims. The first is to characterize an efficient and cost-effective database management tool (DMT) for developing a GIS-based approach to using observed and projected data, for decision-making by non-expert government authorities. The second is to document how to use the DMT to exchange highly specialized climate change information in understandable form, and to assist local decision-makers to clarify regional priorities within a wide array of adaptation options. The DMT comprises climate change mapping, statistical GIS, and vulnerability assessment. Kurihara city (area 7,285 km²; population 2,325,193 as of 1 September 2012), a relatively unpopulated region to the northwest of Miyagi Prefecture (area 804.93 km²; population 72,943 as of 1 September 2012) is chosen for a pilot study.

Results of this study illustrate qualitative agreement in projection of summer daily mean temperature. The increase in August mean temperature during a future period (2075–2099) is 2.6–3.0°C. That is less than other areas in Miyagi Prefecture. Particularly, there is a significant change in the number of hot days with maximum temperature exceeding 30 degrees. On the other hand, changes in monthly precipitation are variously different among mountain areas, betwixt mountain areas and flat plains. The bias and RMS (root mean square) errors of percentage change in monthly precipitation between model simulations and observations are -2.9% and 20.7%. These visualization measurements provide an early warning (how and when to adapt) for local climate policy response.

Highlights from discussion

Sinkyu Kang: *With regards to government,s they are only prepared for normal operations, so when disasters happen there is just some kind of shock. Now the whole society is in risk mode, so we need to change our mandate to dealing with the frequent coming of the problems, the risks.*

Sinkyu Kang: *Many people have talked about livestock carrying capacity but I think the livestock carrying capacity is a term emphasizing the demand and supply need for a short timescale. From the side of the ecological timescale, we need to consider longer-term sustainability. Learning how the herders can adapt to the carrying capacity of the ecosystem means we need to firstly understand the ecosystem level carrying capacity so that we can define and measure it properly. If we provide such information to the local community could help to increase the socio-adaptability.*

Renchin Tsolmon: *I also am very much interested in the way climate change [might]positively influence Mongolian land. From the keynote speaker (Andries Jordaan) I learned that Africa might see a positive impact. Mongolia could also see a positive climate impact in the Mongolian ecosystem, so we could also jointly cooperate on this issue.”*

Balt Suvdantsetseg: *“There is an opportunity for Mongolian herders. When we visit them, all of them, they are asking for a warning system [for Zud]. In fact they are asking us to build a system very quickly because this year there was Zud, and so we hear a request for a system at every home and at every level.*

(Note, Zud takes two forms but in either case is a massive climate event in the winter months in Mongolia that leads to disaster level die-off of herds)

Note: Quotations are derived from recordings of the discussions and have been edited for clarity where necessary.



Wanglin Yan: *But when we deliver information to the public, to locals, to anybody, the data of course has a limit of accuracy. If we say something we have a responsibility too. It must be true, right? How is the credibility of the data source?*

Balt Suvdantsetseg: *That is one of the problems. Recently I am looking into the weather information offered to communities in Mongolia. The national weather information center is not focusing on Zud events and that is why it is a bit difficult, but if we look closer at the data produced by the weather information center maybe we can get some of the information and data-sets [that we need].*

Yingjiu Bai: *If it happens next year it is not climate change, it is a projection. [It is the nature of the problem that] we need to give information for the long-scale, about 20 years or 100 years, because we need the time to adapt and take action. So at first we should give good climate change knowledge to the non-expert population.*

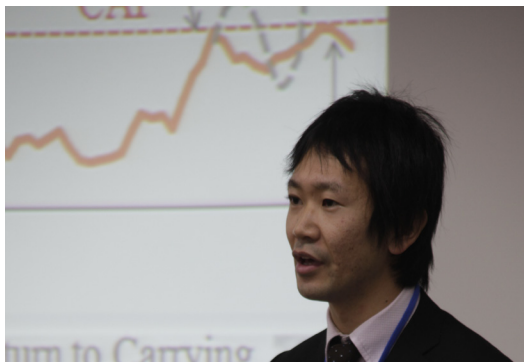


Sinkyu Kang: *All of us, except me, you come from GIS. GIS in my mind, mostly it's historical, information about the past. But by training I'm a meteorologist so I always have climate modeling, so we're dynamic, so we're thinking firstly about change, then we're thinking about the future. But when you are talking about the future it is based on history. With regards to accuracy, what we understand to be accurate is totally different from the government's understanding. If we pass our understanding of accuracy [without translation or commentary] to the government sometimes it is misleading.*

It's like flooding in the US. Scientists there make a very accurate and scientific claim about flooding. The standard is very accurate. But unfortunately, because of uncertainty the real event is a whole meter, or even just a little bit, past their forecast. But because the government believes there is an accurate forecast, predicting something like 37 degrees or 50 millimeters rainfall, they prepare for 50 but actually it's 55. Then the whole city is flooded. So for our scientists I do think that when it comes to decision-making, it is not about what has happened but what could happen.

Andries Jordaan: *My question is the use of ten years or even 20 or 30 years meteorological data. Will it give you the real picture of what's happening? Because what we've found was that our farmers reported increasing drought, and we have land degradation over the past 30, 40 years, and when we start analyzing the past 100 years we actually realize that there is in fact an increase in precipitation and rainfall, and we concluded in the end that it was not because of meteorological influence but because of the impact of humans that we have land degradation. So, for the use of short-term meteorological data...Can we really make conclusions from that?*

Andries Jordaan: *In terms of the impact of the economic liberation on animal numbers, that was quite interesting. Is it linked to land ownership because it is a problem I think all over the world. We have communal land, overgrazing and stuff. What was the reason for that increase?*



Akihiro Oba: *Right now Mongolia is experiencing growth of its GDP, but basically the herders want to increase their income from livestock animals. But there is a distinction. Younger herders want to use their income for education of their children, but the older herders are different. They just want to have livestock animals simply for meat, for their lives. Young people want to buy a good refrigerator or other things, like arranging access to electricity [through solar power].*

Balt Suvdantsetseg: *"If I can add to that... Additionally, they need more economic resources. That's why most of the herders want to increase the number of their animals. However, they couldn't understand [the impact of increasing the numbers in terms of carrying capacity and overgrazing and so on]. After explaining the situation now maybe there's a little bit of understanding, but the question remains about how to manage the animal pasturing system. If possible they still want to increase the number of animals because the main economic tool [that they have control over] is the number and size of the herd. They also say like, okay, if you can give us information about risk, for exactly this community level, we will understand and we will follow your advice... we can slaughter our herds before they starve from Zud and store the meat for the market. They think they can manage. But in most cases, the herders just want to increase the number of animals they have.*

Session Two.A

**Best Practice for Resilience and Adaptation
in the Asia Pacific Region**



Hiroko Kodaka

Associate Programme Manager, Asia Pacific Adaptation Network

Ms. Kodaka recently joined the IGES Bangkok Regional Centre as Associate Programme Manager for the Asia Pacific Adaptation Network (APAN). She oversees three sub-regional nodes (North East, South East, and the Pacific) and one thematic node (agricultural) in her work to carry out APAN activities. Her research studies include climate change adaptation in the Asia Pacific.

Gaps and needs for climate adaptation in the Asia-Pacific region

My paper is about the synthesis report on gaps and needs for climate adaptation in the Asia Pacific Region. This is based on the reports submitted by APAN nodes for last fiscal year and the focus is on capacity building for the future.



Akmaral Mukaeve

Environmental Management Program Specialist

The Regional Environmental Centre for Central Asia (CAREC)

Ms. Mukayeva graduated from Kazakh National University in 2006 with a bachelor degree of Ecology and in 2006 earned her Master's degree. She manages projects using environmental management tools including Environmental Impact Assessments, Strategic Environmental Assessment, Shared Environmental Information System and the project Drynet which is aimed to promote resilience in drylands.

Adaptation to Climate Change in Central Asia: Needs and Achievements

Due to its already precarious climatic situation, which is characterized by scant precipitation, widespread aridity, highly continental conditions, and unevenly distributed resources, the Central Asian region is particularly threatened by climate change, which will exacerbate an already difficult situation. All five Central Asian states have programs and legislation for environmental protection in place. In addition countries develop the National concepts and strategies on adaptation to climate change. Most of activities on adaptation implemented with support of international organizations (UNDP, GIZ, GEF/SGP, ADB and WB). However, multilevel gaps still remain due to several factors, including low attention of policy-makers to adaptation and inefficient use of water and land resources.

The presentation will consist following items:

- Overview the climate change impact and vulnerability of Central Asia with focus on agriculture and water
- Needs and gaps of in the adaptation to climate change in Central Asia
- Best practices and lessons learnt on adaptation to climate change
- Outcomes and recommendations of Sub-regional conference "Multi-stakeholder Dialogue on Adaptation to Climate Change in Central Asia facing COP 18 to the UNFCCC" (November, 2012)



Pervaiz Amir

Global Water Partnership - South Asia (GWP-SAS)

Dr. Pervaiz Amir graduated with a B.SC degree from the University of Agriculture Faisalabad, Pakistan in 1979 and completed his M.Sc in Agriculture economics and a Ph.D in production economics from Michigan State University, in 1982 and 1984 respectively. He also undertook advanced study in Environmental Economics from Harvard University in 2009. His research focuses on impacts of climate change on water, agriculture and environment in South Asia in irrigated and dryland ecologies. Special interest in adaptation strategies and advice to governments. He is a regular guest on various TV & radio programs and author of over 250 professional publications.

Institutional and technical innovation under extreme climate events for resilient and transformation strategy-Floods and Droughts in Pakistan

Pakistan has been on the forefront in facing climate extremes as evidenced by the 2010 and 2011 super floods costing accumulated damages of over US 15 billion dollars or roughly 5% of its GDP. Earth quake of 2007 killed over 70,000 people. While death tolls from War on Terror and as a front line state exceed 40,000 the country has shown remarkable resilience in coping with these climate triggered and humanitarian crisis. What are the lessons learned for coping strategies to enable a manageable resilience and transformation strategy to deal with future eventualities. How does this factor into the changing global financial crisis marred by the impacts that widespread energy outages, fuel price rise, food insecurity and general social unrest the prevails in the region. Pakistan is ranked as the top most country in terms of most costly climate related disasters during last 10 years (German Watch, 2011). The country has made a number of changes in its institutional response structure at Federal and Provincial Level. It is putting into place Adaptation plans and a climate change policy (2012) that is designed to develop greater resilience and transformation in the wake of unfolding climate changes. Are these approaches sufficient or is there need for a shift in thinking on how to go about these massive challenges. Pakistan's case has much to offer to the international audience in terms of learning from how to cope and adjust with the ramifications of climate change. The paper will shed light on this experience and what is being done to overcome the difficulties that persist even long after the extreme event is over.



Ngamindra Raj Dahal

PhD Candidate, Kathmandu University, Nepal

Ngamindra Raj Dahal is a Nepal-based Climate Change Analyst with 15 years of postgraduate experiences in climate change, water and environment management sectors. As a climate change adaptation specialist, he has worked on various research and policy papers for government agencies including the Ministry of Environment, Science and Technology – Nepal, ICIMOD, UNEP, and Asian Development Bank. He also served as Technology Transfer and Training Specialist to the vulnerability and adaptation component of the Second National Communication project for the Ministry of Environment.

Climate Change Adaptation Activities in Nepal

**Xiaojun Deng**

*Programme Officer for Communications and Development
Asia-Pacific Network for Global Change Research (APN)*

Mr. Xiaojun Deng is Programme Officer for Communications and Development at the APN Secretariat. His main responsibilities include facilitating internal and external communications of the Network; managing its online presence including website and databases; and coordinating in-house publications. Before joining the APN, Xiaojun worked at the UNEP headquarters in Nairobi as a language and communications consultant. Having worked in the global change community for about three years, he develops a strong interest in knowledge management and data visualization.

Asia-Pacific Network for Global Change Research (APN) and its Climate Adaptation Framework**Jeongho Lee**

*Senior Research Fellow (Director of Planning and Cooperation Division), Korea
Adaptation Center for Climate Change*

Korea Adaptation Center for Climate Change: Achievements and Future Challenges

Highlights from discussion

Audience: You talk, all of you talk about adaptation. My question is what you are going to, what do you mean? Adapt what? That's the question for all of you. When you're talking about adaptation you're talking about change. If there is no change, there is no need to adapt. At the same time I wonder what is the pace of adaptation and what is the magnitude you are imagining. The term climate change adaptation is not enough. What's the policy?

Masataka Watanabe: Maybe I may start to answer to your question. Most of the nodes are trying to identify vulnerability, not direct change to the climate itself. Even if we have climate change, if we there is no vulnerability, we can ignore it. So the point is we have to evaluate first the vulnerability, what kind of vulnerability exists. In this way adaptation is aimed at reducing that vulnerability.

Sometimes vulnerability is found in the society or the social systems, or maybe the political system. In which case we have to reduce vulnerability in that area. That's why vulnerability adaptation is so broad, it's not only the climate change itself. Maybe climate change is now becoming a rather small portion of the total vulnerability caused by many other climate-related issues. Again, the beginning is climate change, but it is propagating into various sectors, and that is causing vulnerability.

Pervaiz Amir: I think I agree with what you said earlier. We're focusing a lot more on vulnerability. At the COP meeting, traditionally what has been identified is that adaptation is basically a subject which is related to developing countries. Within that group we are pushing a group which is called the particularly vulnerable countries. I belong to one of those as I was showing you, one of those particularly vulnerable countries. There, our focus for adaptation is primarily those manifestations which are climate-related that impact the water and the agricultural sector.

First of all, we are taking all our plans, all our programs, all our medium-term development frameworks, and we're improving those, each for agriculture, for health, for water, for forestry, for energy, and within that, all our new adaptation plans. We are going for no-regret options where we are saying that adaptation, even if it's not entirely because of climate change, we will adapt without regretting the action.

Note: Quotations are derived from recordings of the discussions and have been edited for clarity where necessary.

Xiaojun Deng: From the APN (Asia-Pacific Network for Global Change Research) point of view I think for adaptation we mostly focus, as you can see from our organization's name, on global change, but I agree that all the challenges and all the risks are interconnected, but generally when adaptation is concerned, I think we are more focused on things that are induced by changes in the global system, whether it's human-induced or naturally-induced.

Masataka Watanabe: we used to assess sustainability in terms of tradeoffs. Either you choose economical development or conservation of ecosystem services – but that's not enough. That's the meaning of green development as far as I understand. So economic development has to be within the outer boundary condition of ecosystem service availability.



Session Two.B

**Bridging the Gap Between Policy and Action
for Resilience and Transformation**



Tokutaro Hiramoto

Chief Consultant, Emerging and BoP Markets Consulting Group, NRI

Guest Professor, Meiji University (BoP Business); Part-time lecturer, Miyagi University (CSR, BoP Business)

Tokutaro Hiramoto earned his Masters degree at Keio University Graduate School of Media and Governance. He is working at Nomura Research Institute as senior consultant in the BOP (Bottom of Pyramid) consulting group. He also lectures on BoP Business at Meiji University as a guest professor, and Miyagi University as a part-time lecturer. His work is mainly BoP Business, overseas advance support of private firm in Africa, and public-private company cooperation in the field of climate change. He has authored "BoP Business Strategy" (in Japanese).

Adaptation Programs in International Organizations for Developing Countries

Within the context of leadership provided by countries such as Germany, the United States, Canada, and France this paper aims to suggest which policy proposals the Japanese government should adopt with respect to encourage policy change in developing countries.



Yosuke Nakayama

Chief, Global Environmental Affairs Office, Industrial Science and Technology Policy and Environment Bureau, METI

Yosuke Nakayama is currently the Chief Administrator at the Global Environmental Affairs Office, Ministry of Economy, Trade and Industry (METI). In climate change policy at the METI, he is in charge of supporting sustainable development through the utilization of Japan's technologies and products in developing country. Since joining METI in 2001, he has worked in various policy areas including regulatory reform and creation of new business, regional economic and industrial development, and IT system/software.

Industrial Assistance Programs in Japan for Developing Countries

Ministry of Economy, Trade and Industry (METI) started a new study on feasibility of Japanese private sectors' contribution to adaptation activities in developing countries in this year.

In this seminar, I would like to explain the back ground and purpose, and report current progress situation of the program.



Yoshitomo Mori

*Assistant Director, Research and Information Office,
Policy and Coordination Division, Global Environment Bureau, Japan Ministry of the Environment*

Yoshitomo Mori graduated from Kyoto University in 2000 with a bachelor degree of Engineering and earned his Master's degree in 2003. He was involved in waste administration and global environmental administration in the Japan Ministry of the Environment before he was transferred temporarily to the Environment Division of Tokyo Electric Power Company taking charge of environmental impact assessment for temporary power plants built after 3.11. He is now working in the Research and Information Office of the Ministry of the Environment (Japan).

Adaptation Issues and Policies in Japan



Sosuke Tanaka

Unit Chief, Research/Coordination Section Japan Reconstruction Agency

Born in Hyogo prefecture, Sosuke Tanaka joined the Ministry of Economy, Trade and Industry (METI) in 2007. After 3.11, he worked on the logistics of METI resources such as fuels and daily needs in the Prime Minister's official residence. From May 2011, he joined the secretariat of the headquarters of reconstruction working on managing the reconstruction design council, settling the basic guidelines for reconstruction, and establishing the special reconstruction district. He is currently in the Reconstruction Agency working on industrial rehabilitation, the special reconstruction district, promoting business collaboration, international investment, and investing in Japan.

Issues and Actions in Post 3.11 Reconstruction for Resilience and Transformation



Masaki Takahashi

CEO, Kesennuma Shokai

Masaki Takahashi graduated from the Faculty of Commerce, Waseda University in 1986. He is the CEO of Kesennuma Shokai, which deals with marine fuel, gasoline and LPG. He also works in public office as Leader of Kesennuma City Earthquake Disaster Reconstruction Civil Committee, Kesennuma City Board of Education, Kesennuma City Chamber of Commerce, Manager of Miyagi Prefecture Petroleum Association, Vice-Chairman of Japan Petroleum Association Cooperative Society Section Meeting, and Secretariat of Exploratory Meetings for Seawalls.

Public Debate on the Seawall Construction in Kesennuma City



Ranjith Perera

Associate Professor, Sultan Qaboos University

Urban Environmental Management Program, Asian Institute of Technology

Dr. Ranjith Perera is an Architect-Planner. He received his academic qualifications from the University of Moratuwa, Sri Lanka and Asian Institute of Technology (AIT), Bangkok, Thailand. He was a Fulbright Post-doctoral Fellow at the School of Planning, University of Cincinnati, Ohio, USA. He is currently on leave from AIT and working at the Sultan Qaboos University in Muscat, Oman. His research interests include eco-sensitive planning and architecture, community-based urban environmental management, and disaster preparedness in urban environmental planning.

Mainstreaming Disaster Resilience Attributes in Local Development Plans for the Adaptation to Climate Change induced flooding: A study based on the local plan of Shah Alam City, Malaysia

The threat of natural hazards in urban areas are typically addressed through land-use zoning and building regulations. Climate change phenomenon compels urban planners to devise comprehensive measures to adapt to more frequent and intense hazards. The paper argues for mainstreaming disaster resilience attributes in local development plans as an overarching adaptive measure. The aim of this paper is to assess the extent to which the local development planning system in Malaysia has responded to the vulnerability reduction and resilience improvement needs of the civil society in order to adapt to climate change induced flooding. It is based on a social survey involving a purposive sample of 250 households to identify the adaptation needs of the civil society, and an analysis of the contents of Shah Alam Local Development Plan to verify the response of the planners to those needs. The findings indicate that the planners have been fairly sensitive to the flood risks faced by people and incorporated policies and strategies in the local development plan to minimize exposure of the people and property to flood hazard and improve the adaptive capacity of the urban settlements. However, the sector based organization of the plan prepared by the federal level planners was found to be not adequately incorporating the indigenous knowledge of coping strategies. Therefore, the paper calls for strengthening the participatory planning and development capacity of the local authorities for more resolute mainstreaming of disaster resilience in local development plans.

Highlights from discussion

Wanglin Yan: *Normally you might think that climate change and disaster are different, not the same issue, but it is the same. They share the same fundamentals, share a lot of theory. So for example, I picked up one keyword, it is really a challenge for us: our adaptive capacity. What is the capacity we can cope with, so we can survive this kind of crisis, from this kind of disaster, in the short term and the long term. What is the situation or your feeling about the adaptive capacity in your field, with your colleague or in your business target, then what is the issue, what must we do to improve the adaptive capacity, because this is really a keyword for resilience-building and for kind of short-term and long-term goals and to build on adaptation.*

Andries Jordaan: *I think adaptive capacity at the individual level is in most cases also linked to the risk profile of individuals. Are you willing to do things new, in a different way than you used to do it in the past? But you cannot only measure it by looking at the individual because you need the institutions around that, the market, the inputs, the whole environment, and society must be able to adapt together with individuals so that is not something that can happen, say, within a specific livelihood. You need whole systems to adapt together with that. If you look at companies who need to adapt, they need to adapt for a certain need in the market, et cetera, so the whole environment needs to adapt to a new challenge, which in this case, what we're talking about is climate change. I think I will stand with that.*



Masaki Takahashi: [speaking in Japanese] *From my position, the day after the disaster struck we had to supply gasoline to the pump stations, and when I think about it, it just happened that way. We had our employees there because we are a local company and we had gasoline in our underground storage tank. But I think we were the only ones who opened up our pump station the day after the disaster. When we think about future disasters we have to build appropriate institutions, we shouldn't depend on coincidence.*

Note: Quotations are derived from recordings of the discussions and have been edited for clarity where necessary.

Sosuke Tanaka [speaking in Japanese]: *Based upon my own experience, I can say the following. What is important is the network. By that I mean the issues that we should think about in public venues like this are the things that we cannot solve alone, global warming or international relationships or major disasters. Each individual may believe a certain approach would be the best, but it is only partial optimization. You may be able to find a solution around you, in the public sector or local government, or the private sector or something may be possible with help from civil servants like myself. What I think is interesting at work right now is this new agency or government agency was established, maybe for political reasons, but in this agency representatives from all the ministries work, and people from the affected regions as well as the private sector companies work together, and they have different experiences and they are willing to share their experiences and knowledge. By using their knowledge and experience we can create a new scheme, and it's a repetition of that cycle.*

Yosuke Nakayama [speaking in Japanese]: *What I want to say is that in implementing these projects, for the Japanese companies, their target audience is the citizens themselves, or at most, small regions or citizen organizations in developing countries. As was already mentioned, probably these people in the developing countries need to adapt, and maybe they will face some damage as a result of climate change. Perhaps they know that, in the back in their minds, even if they do not discover it overtly. Uncovering the needs of the people in order to come up with good solutions for them, well I think that is enhancing the adaptive capacity of Japanese companies. I think that the technology used in these efforts can be re-discovered for use in developing countries.*

My second point is that METI has conducted study sessions with companies regarding adaptation, asking what will happen when disaster strikes? ... That is perhaps not an adaptation activity in itself but as a consequence adaptive capacity is being identified, defined and enhanced....In the case of one particular manufacturer they had built a market in a developing country, and in their contingency planning had recognized that if the population did not grow up healthily the market would disappear, that was their fear. They also saw that one of the big issues related to market erosion for them was climate change and the social upheaval that it would cause. For them this included the loss of agriculture as a result of climate change, which would cause their clients to move to urban areas with poor prospects and the possibility of groups like Al Qaeda taking advantage of the crisis and making things worse. I think this is a rare case but the manufacturer was suggesting that when it comes to business related to climate change it is necessary to look that far into the future and weigh the possibilities.

Tokutaro Hiramoto [speaking in Japanese]: *In response to what has just been mentioned, I would like to talk about how the private sector is improving its adaptive capacities and how they're leveraging their strengths and how they are making things possible. Normally, I'm responsible for BOP (Bottom of Pyramid) business in agricultural areas in developing countries, and focused on how businesses might help to alleviate poverty. Since 2009, Japanese businesses have been involved in BOP business. They have maintained keen interest and various companies have challenged the field. By contrast, in the normal way of things companies usually undertake business in advanced industrialized countries, but in relation to the previous discussion, they are now going to a totally different environment. That was their challenge. In their efforts to do this many companies constantly faced with crisis of some sort, finding it difficult to obtain water, or finding there is no power or electricity. In the face of these challenges they came up with different solutions. But then after that, the disaster struck [Japan], and what happened was... Well, for example, Panasonic had developed a solar lantern that worked without an electrical power source. Developed for places where there was normally no electricity they attempted to sell it in the disaster-stricken areas. Because of their efforts in difficult environments outside of Japan, they learned to leverage their strengths, and in a way, enhanced their adaptive capacity. It works in both directions. NEC has sensor technology that was developed for areas with salt damage in India, and their products were useful in the Japanese disaster area (because of the tsunami). What was learned in Japan was then taken to India, so in this way companies are honing their adaptive capabilities because they are working in different environments. That leads to improved adaptation skills.*

Ranjith Perera: *In response to your question I would like to say from the urban planning perspective, in urban areas, the main resources are land and human resources. Land is so crucial in adaptive capacity because planners allocate land for their intended purposes, the most recommended purposes...I think we need to, say, look at our land allocation more critically instead of allowing land development in vulnerable areas, more dangerous areas, but sadly this is not the truth. In many of our countries in Asia, the new populations are settling in the most vulnerable areas.*

That's why you hear that when a big disaster happens, like a few weeks ago in Manila, or last year (2011) in Bangkok, the whole urban system goes under water. When the national capital goes under water, that affects the economy of the whole country. Now what is the response in terms of improving the adaptive capacity by these companies? About 25 percent decided to relocate to more favorable places, and about 75 percent decided to improve their capacity by building flood walls and increasing their height. These are physical things, but the thing is they are not permanent, and at one point, at some trigger point, they will decide to move. When businesses move and people move, what will happen to the national economy and the social system? This is why I emphasize that the management of land and infrastructure is the key for improving adaptive capacity for climate change.



Audience [speaking in Japanese]: *I think the word mismatch is very important. On having listened to the presentations I think there was a mismatch there as well. The person from the disaster-stricken area said, where there were rules with regard to land use standards, he said that these rules must be formulated and put in place. But the director of the institute talked about business management, technology, and network. In specific terms, maybe he doesn't see the importance of this rule-making aspect. I'd like to invite comments from the speakers to this point.*

Sosuke Tanaka [speaking in Japanese]: *So where do I start? You're talking about putting rules in place in advance [of disaster]. In my presentation I talked about how things should be left to the expert, so people who are good at certain things should work in areas of their expertise and that's the most efficient approach. In local governments or municipalities there is a disaster assistance contract between the governments. It forms a network which enables governments to help each other in cases of disaster, but I think this alone is insufficient.*

However, for central government to formulate rules that we should obey, I'm against that. I represent that very government so it's ironic I should be saying this, but I'm against big government. Right after the disaster what was happening in the prime minister's office was very inefficient. Because fixed land lines could not be used, the government gathered information from its own wireless network, and they would hear from police stations things like how a certain hospital had only a few hours of fuel left, but information was very limited. So from Tokyo they would select areas where they could provide assistance based on this system. For the central government to be engaging in this action was really like a planned economy. Information was very limited, so there was a mismatch between the needs on the local scene and what the central government was aware of, and there was a time lag as well.

Returning to disaster contracts, the formation of a natural network is the most efficient I think. In the case of the Hanshin earthquake, volunteers tried to leverage their strengths to help people in the disaster-stricken areas. At the time CSR (Corporate Social Responsibility) was not very much talked about. In 2012, any company knows what CSR is and it's in the brochures that companies distribute to recruit employees. It's different from normal assistance or monetary contributions. In the case of a business working out how to provide support during a time span of 10 or 20 years, the central government must formulate minimum necessary rules and laws. As much as possible, however, this should not be written in stone. I think governments should work to support voluntary efforts and that way we will see faster action.



Masaki Takahashi [speaking in Japanese]: *I would like to take advantage of this good opportunity. Many volunteers came to the region, including volunteers, but in the affected region, the disaster region, it took a lot of effort just to respond to those volunteers. First of all we had to check their identities because there were some people that we didn't know at all, where they came from.*

Similarly, many different kinds of technologies were used to help us, but unfortunately so many were not useful, nor effective. For example, what was needed on the night of day one was different from what was needed three weeks later. Needs kept changing. Solar powered lanterns arrived the same time our electrical grid went back online, so some thought needs to be given regarding timing. If something happens in Shikoku or Kyushu someone should be able to give instructions to start work immediately. When timing is delayed by one day, three days or one week something that might have been effective becomes un-useful, a waste.

Session Three

**Resilience and Adaptation as Opportunity in
Architecture and Urban Design**



Daniel Aldrich

Associate Professor, Purdue University

Daniel P. Aldrich received his Ph.D. and M.A. in political science from Harvard University, an M.A. from the University of California at Berkeley, and his B.A. from the University of North Carolina at Chapel Hill. Daniel has focused on the ways in which state agencies interact with contentious civil society over the siting of controversial facilities such as nuclear power plants, airports, and dams. His current research investigates how neighborhoods and communities recover from disasters. He has published two books (SITE FIGHTS and BUILDING RESILIENCE), 20 peer-reviewed articles and much research for general audiences.

Social Infrastructure and Resilience

Each year, natural disasters threaten the strength and stability of communities worldwide. Yet responses to the challenges of recovery vary greatly and in ways that aren't always explained by the magnitude of the catastrophe or the amount of aid provided by national governments or the international community. The difference between resilience and disrepair lies in the depth of communities' social capital. I highlight the critical role of social capital in the ability of a community to withstand disaster and rebuild the infrastructure and ties that are at the foundation of any community. I examine the post-disaster responses of four distinct communities - Tokyo following the 1923 earthquake, Kobe after the 1995 earthquake, Tamil Nadu after the 2004 Indian Ocean tsunami, and New Orleans post-Katrina - and find that those with robust social networks were better able to coordinate recovery. In addition to quickly disseminating information and assistance, communities with an abundance of social capital were able to minimize the migration of people and resources out of the area. With governments increasingly overstretched and natural disasters likely to increase in frequency and intensity, an understanding of what contributes to efficient reconstruction is more important than ever. This research underscores a critical but neglected component of an effective response.



Andrew Brose

Architect, MASS - Kigali office

Andrew received his B. Architecture from the University of Oregon in 2010 and soon after joined MASS in Rwanda where he has been assisting in the design and construction of Girubuntu Primary School, Rwinkwavu Housing, Butaro Cancer Center, and the Butaro Doctor's Housing complex. In addition Andrew oversees the development of MASS's new projects in Uganda, including the a medical Center in Kasese and design for a new school of public health at the Mbarara University of Science and Technology. Andrew is focused on using innovative building systems and local materials to provide appropriate solutions to social and environmental design problems in resource limited settings.

Empowering Architecture

MASS Design Group (MASS) focuses on the creation of innovative architecture, infrastructure, and planning in resource limited settings. We see design as a missing link in international aid, without which projects can suffer from inappropriate and detrimental infrastructure that fails those most in need. With offices in Boston and Kigali, Rwanda, MASS combines design and construction, capacity building, and research programs to redefine the impact design can have in aiding the delivery of services to the poor. Through interdisciplinary work, in fields sometimes unfamiliar with design, we develop innovative solutions ranging from unique buildings to the development of national standards and policies.



Hironori Matsubara

Associate Professor, Keio University

Graduated from Tokyo National University of Fine Arts and Music in 1995, Hironori Matsubara was a visiting researcher at Moscow Architecture Institute, Russia in 1996 before graduating from the University of Tokyo in 1997. After working at Toyo Ito and Associates from 1997-2001 he moved to Shenyang Urban Design and Research Institute, Liaoning / Atelier FCJZ, Beijing, China from 2001-2002. From 2002-05 he was adjunct lecturer at Peking University, and in 2005 established Beijing Matsubara and Architects (BMA). From 2005 he became associate professor at Keio University.

3 Resiliencies for Architecture at a Time of Acute Change - the ACADEX Primary School project in R.D. Congo

“ACADEX Primary School Project” is school-expanding activity constructing one classroom building per year with Japanese and Congolese volunteers’ collaboration. The project has been run since 2008 by Matsubara Hironori lab. at Keio University and already completed 3 buildings until now. We created the original cement-block and built the arch-gate for the school this summer, 2012. In times of acute change at Kinshasa (the civil war terminated recently and the social infrastructure is maintained rapidly now), we believe the resiliency is essentially necessary for the continuity of the school-expanding not only at the architecture design itself but also at the design process. Here I want to view the 3 resiliencies learned from the ACADEX Project, resiliency at the schematic design phase, resiliency at the design contents, and the resiliency at the building construction.



Vo Trong Nghia

Director, Vo Trong Nghia Co., Ltd.

Vo Trong Nghia founded his architectural office in Vietnam in 2006 after graduating from Tokyo University and Nagoya Institute. He creates sustainable architecture with environmentally-friendly materials such as bamboo. His works have received high praise in Vietnam and overseas and have been awarded with the ARCASIA award, International Architecture Award (IAA), Architectural Review Award (AR), WAN 21 for 21, and WAF 2012. Representative works include wNw Café (2006), wNw Bar (2008), Bamboo wing (2009) and Stacking Green (2011).

Sustainable Construction in Vietnam



Tsukasa Ishizawa

Design Manager, Takenaka Corporation

Tsukasa Ishizawa graduated from Keio University Graduate School of Media and Governance in 2006 majoring in Parametric Design. He joined Takenaka Corporation in 2006, and from 2012 is working as a Design Manager and BIM Manager in Singapore. Major works includes Matsuzakaya Park Place 24 and Tokyo Electric Power Company Okachimachi substation. He has received various awards including the 2010 SDA (Sign Design Association Award), 2010 DDA (Display Design Award) prize, the 2010 prize for colour in public places, and the 2011 SDA.

City in a Garden - Sustainable Projects in Singapore

Singapore's Market Street Tower Project is a pioneering project that serves as an embodiment of the "City in a Garden" concept that is expected to be built by August 2014. It is my goal to compare the Japanese situation to the unique strengths and interests of Singapore. How can we carry out projects with ultra-high rise office buildings surrounded by greenery? How does Singapore's environmental design fare under the Green Mark assessment criteria? Moreover, what effect has the paradigm shift in using Building Information Model (BIM) for both modeling and construction had on environmental design?

Highlights from discussion with Daniel Aldrich



Audience: One of the things in your first book, you were talking about different levels of social interconnection in some of the...communities around Fukushima, and I've since talked to some planners who believe that the communities with less social ties were newer communities that were actually where a lot of the nuclear workers had come from, that they were kind of artificial communities rather than communities that had been stable for a while. But they are speculating and you didn't address that, so I'm curious as to whether you think that's true.

Aldrich: You know, I don't think that's accurate because most of the workers who come in, they come in between two and five years maximum on those construction projects. I assume we're talking about construction and not maintenance for example.

Audience: No, I'm talking about construction and working in the plants.

Aldrich: What I saw, whether it's say Ashihama or now Yashiori, for example, those communities would come in for a maximum of one or two years for a construction firm, [stay in] temporary housing, and then move out again. So in fact in the communities I looked at, I was looking at these population questions...but we also looked at broader questions of the number of people that could go to a kumiai (professional institution) and the fishing cooperatives. Those people won't come in for a year or two to go fishing and then go out again.

Note: Quotations are derived from recordings of the discussions and have been edited for clarity where necessary.

So it certainly could be there are population changes once the plant is approved, but my question...[looks at the time] before the plant is approved; what are the local essential characteristics there in the communities? So it's certainly possible for a year or two as they are being constructed, populations go up by maybe 500 to 1,000. But don't forget, the smallest communities I looked at, Utaba and Okuma for example, they were around 7,000 to begin with, right? So if you bring in 500 workers I'm not sure how much that changes local social ties. Again for me the bigger question [relates to] the groups being affected, like the fishermen for example or the farmers whose crops or fish might have what we just saw in Fukushima, which is nuclear blight; people are not going to buy fish or cattle or crops if they're grown in the backyard of a nuclear power plant. So, yes, the planners, I think they're right in terms of the appearance; I think they're wrong in terms of the overall effect.

Hiroto Kobayashi: Thank you very much for your presentation. I was very much impressed and also I did some research about communities and in that case the matsuri (festival) is very important as [the residents] regularly meet and form a tight connection. In the case of Tohoku, I found that in some villages...the younger generation they still worked as fishermen. Fishing is a much better sort of a business than working elsewhere they say and so younger people return [to live where they grew up]. But then the tsunami came and they lost their jobs, and then they just left. So the population is now decreased again, and they cannot come back because they cannot work in the village.

So the problem is, if you have some amount of people you can really connect [to each other], they create a sort of bond. But the problem is they lose their people, and the older generation well they have a strong sort of bond but the younger ones, they left, and it's very difficult for them to come back. One guy tried to reconnect people using the internet or something like Facebook. That's another way, that's a new way, but the younger people are familiar with that path or device. What do you think about losing the population of the younger generation?

Aldrich: These are huge problems... The very basic answer would be, first of all, there are differences in the way younger people form social ties than older people. Older people use face-to-face reciprocity in Japan, so gift-giving for example, being a neighbor nearby [is important], and unfortunately with the process of [re-]construction in most cities, those connections have been broken up by random placement into temporary shelters, often miles away from their original homes.

Now we estimate one in eight communities in Tohoku made an attempt to resettle as groups, that is to move block by block, neighborhood by neighborhood, five or six families together. That's fantastic. Of course the other seven, eight, several of the communities that we're looking at, didn't do that, and of course we know from Kobe, let's say 215 people died, and not because they were sick or because they weren't healthy or warm; they were in large-scale apartments by themselves, placed there with good intentions by planners who wanted to get them out quickly, and we've seen unfortunately the same process here, that people who are elderly and infirm are being placed very far from family ties, doctor networks that they know, in an attempt to get them out of the areas and get them to someplace safe. So I'm clear about that.

You're exactly right. Populations have changed. There's a problem with signaling also, which is when, if you're a business owner, you're not going to reopen your business until you're sure people are coming back. [On the other side, as a resident] you're not going to be coming back until somebody opens a business to sell food or gasoline...so there is this catch 22 situation evolving. Both sides, business owners and residents, are waiting for information, and the more individuals who say, "you know what? I'm not sure what's going on right now, things are being delayed, money is being spent in Okinawa as opposed to my hometown". One, we estimate something like 16 percent of the rubble, only 16 percent has been picked up so far. You have all these conflicting signals of what's going on, so both are losing their desire to wait any longer. So individuals exit at this point because they don't know if there's going to be a job for them and businesses don't know if there will be people living nearby, if they will have a clientele for their business.

There are some attempts now that I have seen at sort of social philanthropy I guess you could say, American firms now investing in local businesses in Tohoku. We are building a sake plant for example, helping to invest in local breweries. Those are very targeted and very small in number but I think if you're talking about what to do, that might be among the things you could do because it gives you a strong signal - We're having a new brewery open, it will employ 25 people, you

can build a house nearby and be assured of a job a year from now. Otherwise, I'm not sure, the government has sent very mixed signals, both with its actions and with its official plans. There are many communities in Tohoku waiting for approval from the central government for funds. [On top of that] most of the projects are large-scale. They are building bridges, they are building roads. None of this construction will directly benefit individuals who are living there who need to know "do I have a place to even live, a job for my family and my son, or a school for them? "The Ministry of Education has been denying permits to merge schools in some of these areas. So I mean all of the problems now with bureaucracy and past rigid approaches are coming to a head right now, a year-and-a-half after the disaster.

All of the problems you mention I agree with. I think they are actually deeper than that because I think we have the signaling problem where both business owners and local people are waiting for information that they're not getting and the longer that wait takes, we saw this in New Orleans, the longer the wait is, the probability of them coming back drops. I think we're going to see much broader depopulation across these areas.

Hiroto Kobayashi: I'm wondering about virtual sort of social networks.

Aldrich: We think those can be in a sense complements to but not substitutes for actual networks. So most of us are virtual friends with our real friends because we have some of them we know in real life and we then Facebook friend them or Twitter them or whatever. We don't think that really builds a new level of ties, it simply extends existing ties. And those types of networks don't exist for older people over 65, so again, for the younger people who need information it might help a little bit, but I think for the majority of people living in Tohoku, which are elderly people who don't have access to those things, I'm not sure those kinds of networks will be helpful to them.

Audience: A very simple question and a simple answer maybe. What do you think the level of having a mortgage adds to the inflexibility or immovability of the affected individual or the individual family?

Aldrich: It's a mixed bag. We've seen this in Kobe, in both Kobe and in New Orleans, so we can track both home ownership versus renting. Having a mortgage is a tie. It's one of those ties that does lock you in, but not necessarily. My old neighborhood, in New Orleans was thriving, now it looks like this: house, foundation, foundation, blank spot, house, house, house, foundation, blank spot. Most people that I lived near, and with, had mortgages as well, and for some of them it was just not worth trying to rebuild an area where they weren't sure about schools, they weren't sure about long-term crime and so forth, so they were willing to short-sell it back to the bank.

There are other ways that you lose money, but for a lot of communities, don't forget in Tohoku, many of the people built their own houses in some cases, or live with their relatives. A mortgage really doesn't tie people that we've been talking to in Tohoku in most of these villages, that's not the tie that will keep them there or not. So I think it's dependent on where you are. In New Orleans as well, most people for example, when they inherited their houses, there was no mortgage to speak of and the house was theirs, so there was nothing to pay off. I'm not sure the mortgage by itself is a critical tie.

Audience: A quick question as well. Does your research show anything concrete about the relationship with bureaucracy and the time to recover for residents in the community of Tohoku?

Aldrich: The bottom line for us was that the strength or weakness of local, regional, and national governments didn't have a measurable impact at the individual household or neighborhood level. It might set the tone overall or you could get more money back, but simply having an incompetent governor or a corrupt mayor like in New Orleans didn't make a difference for individuals who were rebuilding their homes or rebuilding their lives. For them, those were sort of bird's eye level questions.

The question for them was, where is my kid going to go to school? Where do I buy gas for my car? Is it possible for me to find a place to work? Can I rebuild my home with the money that's coming in from private insurance or public assistance? Most of the people that we talked to didn't really see the government as a primary question at the end of the day.

In fact, you can measure this pretty well because you can see in some cities that the governor or the mayor switched in the middle of the building process, we saw no effect in that switchover from one mayor to the other or from one governor to the other, in our mind implying that basically it didn't really matter. It was Mayor Nagin or Mayor Blanco in New Orleans or in this case if certain governors or certain mayors are in place up in Tohoku. There are much broader questions as a society, but individuals I think have much more specific and detailed needs than what a governor or mayor [can offer.]



Highlights from group discussion between session members

Question: How hard is it to get your social and cultural ambitions implemented? Are there any gaps that you need to fill?

Tsukasa Ishizawa: First of all, as you know, in Singapore almost all of the development is backed by the authority of the government, and most of the land is owned by the country itself, so it's not so difficult to decide something and push it forward. But I feel another gap exists between decision-making and the actual fabrication and construction. We have large construction crews on our sites, and they come from Bangladesh or India or other nearby countries, and communicating with them never mind teaching them how to built what we are aiming for is another issue.

For example, a new worker comes to the site, but until yesterday he was in a Chinese restaurant boiling noodles or something like that, so to tell them what he needs to do is our concern - how to tell them properly what he needs to do and by when. From my point of view BIM is quite useful to illustrate what they need to do in this case. We can show them that today the site will be like this; and tomorrow we need to work up to this landscape element, so what you need to do is like this. It helps to use BIM to illustrate the work when language is not going to work. What I'm also doing with BIM technology is keying in the timeline information and estimating how many workers are necessary to finish up the work, and if there is a delay, what countermeasures need to be taken. Do we need to do 24 hours work or do we need to increase the number of laborers, and this kind of so forth. Management is the key for a project. So this is quite a different point of view from your countries, but for me this is my point of view on filling the gap.



Andrew Brose: I think overall we're all trying to achieve the same thing. Of course there's a difference in how we do it, for instance in Singapore maybe you're achieving it based on a certification.

We're obviously restricted by materials and skills and labor, but we're still trying to get the proper ventilation used by materials and train within each project. Something we often deal with in Rwanda is contractors will tell you that a project will take half

the time it really will, because they want to get the project, and something that BIM allows us to do - and we don't use it nearly to the extend that you may be using it in Singapore - but when we go to site and we find that another contractor has done something completely different than what we've asked of them, it allows us as designers to kind of come up with a strategy how to continue working with that. And we've done projects using BIM where it's very easy to modify things quickly, and while it's kind of the opposite end of where BIM allows you to think about everything ahead of time, it also allows you to make changes very quickly, which is unfortunate, but working in a developing context or resource-limited settings we've learned how to be adaptable.

And I think, again we're all, as architects we're social scientists and we're learning how to work with an end-user to provide them what they need, whether it's a healthy environment or it's a LEED-certified or, sorry, CASBEE certification. We're all still trying to get to a similar goal. But it takes, of course there's a difference in scale to each of these.



Vo Trong Nghia: Can I speak in Japanese? [laughter] I'll try to speak in English, but I went back to Vietnam in 2006, six years ago, and then of course at the beginning no construction company wanted to build our designs. Of course the bamboo work, and the school and the house, everything really. So that's why when I started with the wNw Café I had to train the staff, train the workers, and then I found I had a construction company.

Yesterday we talked with Kajima Corporation (a large construction company in Japan) about setting up a large construction company in Vietnam, because right now I start all of my designs with the limits of my own construction company, which is problematic. Some simulations or structural calculations, we cannot do them in Vietnam, so I asked Mr. Araya in Waseda to help me and some people at the University of Tokyo as well because we have a lot of projects going on at the same time. From the beginning that's why I had to establish my design company along with a construction team, and now all the schools, the houses, and even the project in Mexico, or in Shanghai we do the work by ourselves. This is really hard to manage on my own, so we have a lot of Japanese staff and European staff, yes, yes, to manage our projects. And now we have the new office in Nihonbashi (an area in central Tokyo), because we are starting many projects in Japan, yes.

Hiroto Kobayashi: So you are sending your staff to the building sites? Outside of Vietnam? And then you supervise the work yourself?

Nghia: Yes. Yes, ten people are enough because, in the case of the house for example, we design one but we copy it many times, so we send just a few staff to the area and then we educate the local people, yes.

Yasushi Ikeda: What was the reaction by the local community after you finished a project? I mean, after you taught some people about the use of the technology, how to build something with bamboo, for example? I imagine it was a very good experience for them too.

Nghia: Yes, it's very good. They can make their houses from bamboo because they have a lot of bamboo around them, so for example all of the people from my village helped me to make the bamboo projects, and now in my village they make houses from bamboo by themselves and they can save a lot of money. Of course we can expand with a lot of projects, not only the bamboo ones...but also stone. The builders challenge themselves, and that's why we can expand very quickly.



Matsubara: I am also facing the gap problem in our Congo project. For me, my most important problem is how to keep the quality of the construction, because I know Japanese architecture and I have some experience, but I ask myself why I must make such a, how do you say, why I should do such unsophisticated details in the Congo? But at the same time, I have learned to think differently. I have come to realize that I'm fighting with the market economy. What I mean is I should create something, a new thing, but it's unsophisticated, and that's okay. With the Congo project we do not have riches of money and the construction materials are limited, but we can control time. For example, we don't have to finish everything in one year. In one year we make just one building, but we will have six classrooms in the whole school so it means it will take six years, and that's okay. This year we don't have enough money in the budget so we only made the school gate. We didn't make the classroom at all. We understand that in the near future we can make a good school but it is not finished, and this is the way we fight the money economy and solve the gap problem. This is my understanding. Time is really important for such a project I think, so if time passes, many people are coming and are involved a lot and sometimes it's more useful and worthwhile to the local community.

Ikeda: It's very interesting. You are all saying very similar things about the difference between importing technology from here to there, or trying to organize local communities around certain technologies you are bringing. So what is the basic difference? Nghia-san, I want to ask again too. What do you think? I mean, I think everybody tries to bring technology into other countries, but it's different from just transplanting. In the previous session, Daniel showed us that physical devices are weaker than the human capital, but after I heard your presentations I started to feel that maybe building something is also a very effective way to grow the community as well.

Kobayashi: I don't know if technology is the right word or not. With a lot of ideas, you try to introduce things to solve a problem, even in an unsophisticated way. That is the most important attitude toward the problem in many cases. At the same time, in the case of the larger scale, like the city planning scale, are primitive ideas workable or not?

Nghia: You mean about the big scale? Yes, we are thinking about that because in Ho Chi Minh City we want to make the green roof or the roofing because of overheating, so that's why we started with the tube house, because if we copied it in the city where it is visible, people can see that, and the Vietnamese people, they are smart and will copy it. So it's a very good influence on the city, at the city scale. Of course to change the policy of the government is really difficult but we can act with small things, and have a big influence on society. It's like the iPhone. One design but sold to the world - Just like that we can design one house and sell it to all over the city.

Galloway: Let's go from there. How do you increase your impact and how do you have a larger effect?

Andrew Brose: I'm kind of tying into the last question a little bit too, but at the opening of the hospital, the ministry of health came and told us, I want to copy and paste Butaro everywhere over Rwanda. That's great but let's not do that because it's not going to work because it's very site-specific. We designed it for a context. So now we're in discussions with the ministry of health on developing a set of standards and guidelines for all health facilities in Rwanda, and it did take a grassroots project, it took something very small, it took thousands of donated hours on our part, in order to be recognized or noticed. And I'm sure with all of us it takes doing a prototype or a model before you can prove that the system or a technology or a method works. And that's kind of how we're moving forward.

We can't always be doing grassroots projects. We also have to be working at the government level in order to effect a widespread change. And we see that there's an issue with construction technologies and methods right now in East Africa, and so we're working now with RHA, the ministry of infrastructure and all these other organizations within Rwanda, as well as continuing projects with small local organizations. Of course, like I said, we're a not-for-profit organization. We work on a kind of sliding fee and a donation scale and we're all donating a lot of our time and working for very decreased pay to do this because we enjoy the work and we think it's very valuable work. I think for the future we see hopefully more projects are fee-based and that allows us to do us more pro bono work or not-for-profit work, but we'll continue working with very decreased salaries because we really enjoy it, like I said, we enjoy this work.

I think the future for us really is how can we continue these very small projects while receiving the funding we need, and also continue these conversations with USAID, with ministries. We even recently won a tender for a project in Liberia. And so we're slowly growing and expanding within Uganda and Liberia, and a little in Osutu, and people are recognizing this work and recognizing the success of this. I think this goes back to a question you asked earlier about quality. A lot of times we're going for that great shot to publish, but clients love that too, and especially when you're dealing with a client who has very limited funding, and when they're seeking more funding, if they present a project which is successful not only because it looks good but because the numbers back it up, then there's going to be plenty of people who are supporting them and the work they're doing. And so our core mission is amplifying the mission of our partners, what do they need to be more successful as an organization, and it's not always a facility, but we'll do our best to help them however we can.

Ishizawa: In singapore, to create a green building does not mean contributing to the original tropical nature itself. The aim is to create an attractive city in order to get more investment in the city, because Singapore's viewpoint is always based on the financial or economic background. Their prosperity is based on gathering talented people

from all over the world and associate the city with that. There are some general contractors there, but mostly they bring general contractors from other countries. It's always like this. So they always are finding some good way to do something, but rather than learning the technology or fabrication method, they source that kind of thing to other countries and they gather the outcome and coordinate or accommodate the output to create a better city. That's the basic concept of Singapore. It's quite different from Japan and other countries. Not every country or city can do this. It's a quite limited model to create the city.

Matsubara: When we started the Congo project I thought to myself that we would do very special, very unusual things, using the Japanese students to carry out the work. Now I don't have that idea anymore. In 2008 when we started I emphasized our uniqueness, especially the geographical location and the project background. That is gone now. One reason is that when I visited the ministry of construction in the Congo, I learned that there is no ministry of construction; they only have the ministry of reconstruction. Why? Because they had a serious civil war and they need to reconstruct. Actually, up until 1960 they had a very rich landscape and city and Congo was a

kind of dreamland for European people for summer vacations, for Belgium especially. But after the 1960's a dictatorship took over and the city was mostly destroyed and now they need to rebuild. This situation is not so different from, I'm sorry, but it's totally equal to the Tohoku situation I think. After my experience there I felt our project is not so special because it's about rebuilding. I am doing something, but a very ordinary thing in Congo, in Africa. This is my frank impression now.



And I think, for example just as Kobayashi-sensei just said, at the start of the project the Congo people were very kind and very open and laughing, smiling with us. But once we knew them better and worked together with them, they slowly started to talk about what kinds of problems they have and what they really need. They are really proud people and don't ask for anything, but once we became friends they expressed their ideas. Now, I don't think I'm a foreign architect in the Congo. I am just an architect who is working in the Congo.

Nghia: I am doing my school for money. It is volunteer too, but because I have a factory I just make some concrete with some control of the quality of units, and the people can take the parts and assemble things like a table. The most important thing is we can do that at very low cost because we prefabricate the parts and it goes together bolt by bolt and it's easy to make a school or a house.

Galloway: So you're building an industry by yourself.

Nghia: Yes, because I think we have to.

Galloway: So we can ask the same question then: where do you go from here? What's next?

Nghia: Like I said earlier, we want to add trees to the buildings, in the city houses, so we are trying to make a

lot like that. Not only that, we manufacture a lot of green buildings, green houses. In Vietnam we have many places that are very poor like in Congo, so we do the same thing but we manufacture the parts because we calculated it is cheaper to assemble pieces and let people build on their own rather than have me go there.



Galloway: Is that possible in Africa?

Nghia: Of course. Of course, of course. We can do that.

Matsubara: We must find something different instead of bamboo I think.

Nghia: Yes, of course. I'm not talking about bamboo, but instead you can make concrete bricks, right?

Brose: Something we struggle with in Rwanda is tolerances. I'm sure you see this in Congo too. I mean, guys don't have tape measures.

Ishizawa: In Singapore the definition of resiliency will be quite different from Japan because in Singapore there are no earthquakes, there are no typhoons... and no strong winds. So the risk of disaster is small compared to other countries. Resiliency or some may say the sustainability is all about how to keep the environment independent, I mean as a country, because the land is so limited and they need to supply water or electricity, and all of the infrastructure by themselves. One of the major concerns is water, which comes from Malaysia. Because these days the relationship between Malaysia and Singapore is not so good, and that's why Malaysia is increasing the water price, almost 100 times compared to ten years ago. That's why Singapore is now quite struggling to source the water by themselves. It forms a very strong background to government policy - they are trying to increase the water area and to find new water sources.

Ikeda: Countries have different risks. The same thing is happening in our country. Here we have this food security issue, the energy security issue.

Galloway: Self sufficiency is an important aspect of resiliency. How about you, Andrew? You've been... I can see you thinking but you're not speaking so much yet. I'm curious what you will add to this.

Brose: In terms of reconstruction, Rwanda lost a lot of craftsmen in the '94 genocide, and the development that's happened since then has been very quick, and a lot of Asian contractors have come in to design and construct these buildings quickly and there hasn't been any training or skills transfer. There was a time where you had masons and carpenters and welders who were skilled, but we lost a lot of those craftsmen and we're now dealing with a very young set of workers. And so something we're trying very hard to do is retain the guys that we train on site. It is hard to do because it's not typical - like when you hire a contractor and he comes with his crew. Generally we hire people on a daily basis. For example in Butaro, we would hire laborers who don't have any particular set of skills, they come to the gate in the morning and they get hired for carrying water or transporting dirt - labor is cheap and it's the one thing that is readily available, as opposed to materials or tools.

So the primary way we're trying to build resiliency, through every project, is by keeping people we've trained and people who've become our more skilled masons [we want to] keep them on to other projects and have them train the next guys. It generally tends to be about who we can develop and who we can continue to use as skilled laborers and less about the technologies and less about the materials, which we're still trying to introduce. There's more of it in Uganda and some parts of Kenya, but Rwanda is so land-locked and expensive to bring anything in that labor is kind of the one asset we have.

Ikeda: It's a very good point. Maintaining the skills that reside in the people themselves is important to create resiliency.

Brose: Something that's hard is, in Rwanda, if you have a job it's good for however long you have it and you'll move to the next job, whatever the job is, and so not a lot of the people have pride in their work, whether they're a mason or a carpenter, what have you. It's hard to find people who really are dedicated to that work and who, they could be a taxi driver or they could be selling mandazis on the side of the street. People are so focused on making what they need to survive on a day-to-day basis and that pride in their work is something that is coming back, but it's hard to find right now.

Galloway: It sounds like the infrastructure that architects usually rely on doesn't exist for most of you in your work. If I can find something to connect all of you in your diversity, it is this sort of non-standard practice. Maybe that's a new normal, everyone has to innovate just to do normal things, but no two efforts are the same. You have to make your own factory or you have to make new software or you have to train people to stay for more than one day or you have to make your own bricks or come up with a new structural system. Is it possible to comment on this kind of thing in the context of reconstruction or practice...

Kobayashi: Last year I started to have doubts about standards. Everything was broken, and the standard didn't work. Even though we thought Japanese technology, our science and everything was so perfect, all at once it was broken and we began to rebuild from scratch. So I think maybe it's a good change for us to think about a new standard, or a personal approach to the problems we face. Of course we need some standards to make things work easier and faster, but at the same time it's a good chance to create a new standard. That's what I'm feeling since last year.

Ishizawa: I have an impression regarding this topic of resiliency. Since March 11 last year, and this is true also in Singapore, sometimes they doubt the conventional system, the established way of building, and sometimes we are asked, is this building really safe? To answer we need to make a simulation or analysis. It used to be that simulations were to prove that a design is effective or better than another option, but now we use simulations to prove safety. For example this building we are doing now has a kind of flower at its top, but it is unique. There is nothing to compare it to in the world, so we need to prove that the funnel shape is safe from a structural view. If we think about it, maybe the funnel will vibrate or make a sound, nobody knows. We need to make simulations to measure the effect. It is not only about design. This is quite a new point of view for me.

Nghia: When I went back to Vietnam, from the architectural and construction standard in comparison to Japan, well after ten years in Japan I felt that we didn't have ANY architects in Vietnam. They just made buildings, they just made houses, but not architecture. So we have to educate the people, even the workers.

Galloway: Can I maybe just switch completely to the question about inspiration now. What are you thinking about for the future and what is it that is driving you now? What made you think about being an architect?

Matsubara: Can I answer a different question? I think the important role of an architect is not only to create the forms and to design something but also to find the frontiers; not only geometrically, but also something like a new way to survive. For example, I said before I'm fighting with the market economy, but actually I want to find a way to make a connection between this kind of voluntary work and the market economy. For example, the government of Japan pays lots of money to NGOs or NPOs who are making schools in developing countries but we didn't take any of those funds. Instead I want to extend our activity, to involve more power or capital and to extend our activities. In this post post-modern society, the role of architects is not only to design buildings but also to try to find new frontiers. I think is very important.



Nghia: I myself am very simple. I was born in a small village. There was a war with America and the Vietnamese, but that is a separate issue. In my house we didn't have electricity. We didn't have newspapers. No TV, no radio. We went to school, but it was in poor condition every year, so we almost never actually went, because we didn't have a usable classroom. At that time, some people in my village, they came to my village, and they were architects. One architect, he looked, oh, he looked like he had a lot of money, like he was very rich. So that's why I wanted to be an architect. [laughter]. Then, when I studied architecture in Japan I felt, oh, no, architects are poor [laughter] very poor, and so at that time I tried to understand how Tadao Ando and others did it, because they are not poor. They are not poor. I worked for Sejima's office and they expect us to work for like 15 hours a day without pay. Just making models, and I felt this is not a human life. [laughter] Yes, I felt that. So that's why I am trying to manufacture architectural parts, so we can earn a lot of money, and we even can give them away to build schools and houses, but I don't want to say that architects are poor. Because my dream began with that village architect, and I grew up in a world without information, not even knowing about Christmas, like in North Korea today perhaps, I just didn't know that architects are actually poor. That's why we are trying to make the architecture office the way we are. Some magazine ask me if I was influenced by Tadao Ando and I say yes, but not as an architect, mostly the way he deals with PR. [laughter]

Galloway: *The nice thing is you do good things at the same time, so it's not like it's a selfish thing either.*

Nghia: *No. We aren't. And I don't want my staff to work through the night pulling all-nighters. At my office late is 10:00. I don't want anyone to work later than that.*

Galloway: *Andrew, what do you think?*

Brose: *[My inspiration for practice begins with] a little bit different twist. I was originally planning to study international development, and I was doing an internship in southern Burundi and we were working with refugees who were returning from Tanzania to put them into homes. There were 500 refugees coming back into the country. And as an NGO we were purely donating materials for the project. So it was mud brick and timber frame and corrugate, zinc-coated corrugate sheeting, and a wood door and a wood burglar bar window, and everybody was grateful for the materials but they kept complaining about how hot the houses were and how stuffy they were inside and how it was great to be getting these houses but they weren't working that well, and they kept pointing to the fired brick houses up on the hill or in the capital and saying we want something like that. And I was asking myself, why do they want that? Why can't we give them the same price for materials that just work better? I started asking myself a lot of these questions and I decided to study architecture to see if I could figure that out.*

I actually didn't intend to necessarily end up back in Rwanda or back in that part of the world, but I've been fortunate enough to work with some great people who are doing some enjoyable work. A number of my colleagues in Rwanda have taught me a lot, especially some of the guys from Shanghai. Studying architecture kind of solved some of these inherent problems I was seeing, and actually just encouraged me to continue even more and more. I'm pretty young still and I have a lot to learn, so I'm excited about the opportunities to learn from my colleagues and continue studying in the next years.

Ishizawa: *Originally, what I wanted to do was explore the architectural world in a different way. Since I'm an alumni of Keio University I thought I had some advantage in terms of skills related to IT information technology. When I had an interview at Takenaka was asked why I was experimenting with IT and architecture and I answered that it was to find a better way to design so that we could call it a day at 5:00 [laughter], but what I actually think is that when we adopt new technology maybe something useful can be changed. I cannot say it will be an improvement but it's worth trying. Now I am a BIM manager and exploring the topic from a designer's viewpoint, but at the same time maybe I can play some role in the construction phase or some of the facility management phase. I am still searching for a way to explore architectural design from an outsider's viewpoint.*

Kobayashi: *Last year I was shocked by the disaster and tried to rethink the architect's role. I was asked in a symposium about this and Fumihiko Maki was there, and he tried to answer but couldn't, and I was the same. I am still thinking what can I do for people or for communities, and it has been a chance to rethink my life as an architect. I am sort of starting from scratch now. I am of course still doing projects in China and Japan and try to find work. At the same time, I try to spend as much time I can to come up with new ideas for architecture. So this is my second life as an architect.*

Galloway: *That's a good way to end things I think.*



Special Session

Tohoku Planning Forum



Andrew DeWit

Professor, Rikkyo University

Andrew DeWit holds a PhD in the political economy of Japan (UBC, 1997). He teaches the political economy of local finance and energy/environmental policy. He is lead researcher for a five-year (2010-2015) Japanese-Government funded project on the political economy of the Feed-in Tariff, a coordinator of Japan Focus and a member of the Toshima-ku (Tokyo Ward) commission on Gender Equity. Recent work includes (with Kaneko Masaru and Iida Tetsunari) "The Financial Crisis and the Green New Deal (in Japanese)," in the Green Industrial Revolution.

Renewable Energy and The Political Economy of Japan



Wanglin Yan

Professor, Keio University, Japan

Leader of the Environmental Innovators Program at Keio University

Director of Center for Climate Change Adaptation

Professor Yan graduated at Wuhan Technical University of Surveying and Mapping in 1982 with a bachelor degree of Engineering and earned his Master Degree in 1989 and Doctor Degree in 1992 at the Department of Civil Engineering, the Graduate School of Engineering, the University of Tokyo. He is a specialist in Geographic Information System and Science and contributed to the design and reconstruction plan for Sichuan in China after the city was strike by a massive earthquake in 2008. His research work includes examining the degradation and conservation of the grasslands and making adaptation plans on the Tibetan Plateau and Mongolian Plateau in China.



Will Galloway

Project Assistant Professor, Keio University

After completing his Master of Architecture degree from the University of Manitoba in Canada, Will worked for several years in the UK and in Japan as an architect before completing a PhD in urban planning at the University of Tokyo in 2008. In 2006 he co-established the architectural practice "frontofficetokyo", which has won several awards including the International Architecture Award in 2012. Following the disaster in Tohoku in 2011 he became one of the founders of the Tokyo chapter of the design-led disaster response organization, Architecture For Humanity. His field of expertise is sustainable architecture and urban planning.

Reconstruction, Energy and Community - Precedents for Japan

Christian Dimmer

Assistant Professor, University of Tokyo



Dr. Dimmer graduated from the interdisciplinary Spatial and Environmental Planning program at the Technical University of Kaiserslautern, Germany, and earned his PhD from the University of Tokyo. He has cooperated as an urban design consultant with architectural firms such as Arata Isozaki and Associates, and property developers like Mitsubishi Estate Inc. In 2006 he co-established the architectural practice “frontofficetokyo”, and in 2011 was one of the founders of the Tokyo chapter of Architecture For Humanity. He also teaches sustainable urbanism and planning theory at Waseda University’s School of International Liberal Studies.

Grass-root Initiatives for Alternative Energy Futures in Germany

Hiroto Kobayashi

Professor, Keio University



Hiroto Kobayashi is an Associate Professor of Keio University Graduate School of Media and Governance, co-director of International Keio Institute for Architecture and Urbanism (IKI), and a Visiting Associate Professor of Massachusetts Institute of Technology. He studied architecture and urban design at Kyoto University and earned a PhD at the Harvard Graduate School of Design (GSD). He worked with Nikken Sekkei and Norman Foster and Partners as an architect before founding Tokyo-based architectural design office KMDW in a partnership with Naomi Maki.

Veneer House at Minami Sanriku

Special Session

The leaders of the Tohoku Planning Forum arranged a special session of their monthly meeting as part of the 2012 EI symposium with the aim of sharing their normal audience and their accumulated expertise on the reconstruction project in Tohoku with the adaptation oriented symposium participants. Discussion ranged from the possibility of creating community based energy systems that are independent from the national grid (Christian Dimmer), to the dwindling potential of Japan to react to the disaster with new energy infrastructure (Andre DeWit), and the possibility of making a new rural plan for Tohoku that is centered on energy issues as well as a response to the expected massive shrinking population of the region over the next decades (Wanglin Yan + Will Galloway). A presentation on a new construction technology developed by Hiroto Kobayashi was also offered, followed by a discussion in a round-table setting on where Japan might go into the future.





Session Four

Best Practices in Community-Based Energy Innovation



Harutoshi Funabashi

Professor, Hosei University

Professor Funabashi's chief research aims to master basic sociological theories based on social surveys. Themes include social planning and social movements related to environmental problems and regional problems. Major academic papers include "Minamata Disease and Environmental Governance" (2006), "The Duality of Social Systems and the Environmental Movement in Japan" (2011), and "Why the Fukushima Nuclear Disaster is a Man-made Calamity" (2012).

Opportunities and Challenges for Development of Community Based Renewable Energy

From the report concerning individual regions' efforts to encourage the use of renewable energy, we have assembled a collection of questions based on case studies:

Q1: What is energy an strategy shift? Why do we need an energy strategy shift? When we look at renewable energy built on local sources, what are their merits when we consider them from a "resilience" or "vulnerability" point of view?

Q2: At the moment, in every region we have seen, the push to encourage locally sourced renewable energy is growing. What is necessary to accelerate the implementation of renewable energy management systems?

Q3: Are there common ways to address the cleanup of radioactive material in Fukushima and to encourage development of renewable energy simultaneously? Additionally if we consider the basis for the improvement of resilience to be "the organization of community cooperation", why is Fukushima a problem?



Akira Taniguchi

Ohisama-Shimpo Energy

Akira Taniguchi graduated from Nagoya University Graduate School of Environmental Studies in 2004, and joined the development branch of NGK Insulators, LTD. After seeing a TV program on NHK about Ohisama-energy in 2008 he was inspired to change his career. He is now working as a business development consultant/ manager in solar power generation and citizen fund trying to realize a model for local production and consumption of renewable energy starting from Nagano prefecture.

Innovation and Achievement With Small Community-Based Renewable Energy Projects

Presently the largest barrier to renewable energies is cost. In 2004 Ohisama Shinpo Energy Inc. founded a non-profit organization with the intent of producing energy for local consumption in the Minami-Shinshu area of Nagano prefecture. Through local fundraising the group was able to establish a solar-power plant ("Ohisama Power") for a local nursery school and have a significant impact on environmental education as a result.

From this step, a contract was formed with the city of Iida in 2005 to promote the further distribution of renewable energy technologies for the next twenty years. The goal is to fund solar generation projects with local citizen-based funds across the country for the direct benefit of the inhabitants of each area themselves.

From the initial investment of 2 million yen, a solar plant comprising of 37 panels was established on the roofs of the nursery and public hall buildings. As of now, approximately 8.5 million yen more has enabled the expansion of 250 more solar panels on businesses and private homes alike. The same fund has enabled the advancement of businesses that supply energy conservation equipment and wood pellet boilers. Our project has demonstrated that through a combination of funding support from the nation, a focus on the community, and the encouragement of community businesses, the advancement of the renewable energy industry is possible.



Taihei Shibata

*Director, Smart Community Section, Office for Environmental Future
City Promotion Environment Bureau, City of Kitakyushu*

Taihei Shibata joined the City of Kitakyushu municipal office in 1992 where he led in environmentally grounded projects such as the operation and maintenance of a waste incineration plant, the “eco-town” project, PCB waste disposal, as well as developing measures against global warming. In 2010 he took charge of the Kitakyushu Smart Community development project.

Planning and Practice: Citizen Participation in Electricity Saving and Generation

We aim to introduce the voices and thoughts of citizen participants in the “Northern Kyushu Community Creation Project.” Private industry and citizens work together to implement a new form of demand-side management in their energy usage for the purpose of conserving energy in the region via smart meters and other hardware devices.



Shoji Yo

*Graduate of EI Course, Keio University
(SEKISHO CORPORATION)*

Mr. Yo earned a B.S. degree in engineering from Kansai University, Osaka, Japan, in 1988, and Master's degree in Media and Governance from Keio University in 2012. From 1988 to 2010, he worked with OKI Electric Industry Co. in Tokyo, as a Device Engineer using the semiconductor wafer process. He moved to Sekisho Corporation in 2010 and where he has taken an active role in energy related business in the North Kanto region of Japan.

A new business model based on connections between generations for market penetration of photovoltaic power systems

Photovoltaic power system (PV) is a highly accessible source of renewable energy that can be initiated upon an individual's action. But, application of PV has not spreaded especially in the household sector. For the spread of PV in the near future, incentives must not only provide financial support, but also provide new services. The objective of this research is to propose a new business model for the spread of PV that suits the conscious and actions of the users after the recent Tohoku earthquake and tsunami.

First, this research analyzed the demands the users have with the installation of PV by conducting interviews and studying the research done with NPO. This will make clear of the changes in awareness and actions the users now have after the recent disaster and also help to determine the demographic that is now interested in PV. The results show that “current generation (people in between their 20s and 40s)” show great interest in PV. But because many of these people do not have the necessary environment for individual generation, a model for cooperative PV generation is in high demand.

In this paper, a newly developed business model called “KIZUNA” proposes the economically stable “Senior Generation (parents)” to support the “current generation” in a community/family like bond and provide a new incentive to promote the use of cooperative PV. This business model will overcome the economic hardships that come with PV. In detail, cooperative PV generation will be installed on public facilities through funds collected from the “senior generation” conducted by the Community Energy Special Purpose Company that was recently founded. This business model not only provides an economic incentive for investors (parents) to invest in PV that will benefit the users (children) through the funds earned from selling the electricity generated, but also provides a new service that helps to build and toughen family bonds through these actions. After inspection, this business model cleared the investment analysis index and displayed feasibility in real world scenarios.

**Yusuke Matsuo**

Policy Researcher, Program Management Office, Institute of Global Environmental Strategy (IGES)

Yusuke Matsuo earned his Master of Science degree in Environment Management and Policy at the International Institute for Industrial Environmental Economics (IIIEE) in Lund University, Sweden. He has experience working at Sanwa Bank and The Good Bankers, an investment advisory firm, before joining IGES. His current research interests include green economics and climate and business.

Green Gift: A Pragmatic Measure for Drastic Diffusion of renewable energy**Manjushree Banerjee**

Associate Fellow, The Energy and Resources Institute, India

Ms. Manjushree Banerjee has ten years of experience working on clean energy applications for sustainable rural development. Studies and implementation projects undertaken by her involve social and capacity building related to clean energy, rural infrastructure and livelihood interventions in rural and remote communities. She is also pursuing a part-time PhD from Indian Institute of Foreign Trade, New Delhi.

Achieving Universal Access To Modern Energy- A Case Of Community Based Renewable Energy Project In India

In India one of every three rural households depends on kerosene based lighting systems that are characterized by low illumination and hazardous smoke. Given the existing and foreseeable demand and supply gap, universal modern energy access in short to medium term can only be achieved through a combination of grid and off grid approaches.

The paper presents a case study of use of solar photovoltaic based micro-grids for meeting basic lighting requirements of rural community during peak demand hours (6 pm to 10 pm). Thirty communities have adopted micro-level (75 Wp to 1 kWp) solar based off-grid systems, where the systems are owned and managed by local entrepreneurs with 45% equity stake. Case study analysis of this project undertaken by The Energy and Resources Institute (TERI) in the state of Uttar Pradesh in India highlights that:

1. In grid connected (or, otherwise) rural communities sans assured lighting services, latent market for decentralized alternatives can be tapped into for profitable business.
2. Access to finance networks at local level facilitates private investments for off-grid solutions.
3. Technology innovation and customization is necessary for customer satisfaction and management efficiency.
4. Affordable renewable energy based off-grid solutions can be an economically viable and socially acceptable to its fossil fuel based peers.

An analysis of the project output concludes that decentralized solutions and private investments will play a major role not only in providing universal modern energy access but also in enhancing livelihood options at village level.



Arieta Gonelevu

*Senior Project Officer, Oceania Regional Office
Energy, International Union for Conservation of Nature (IUCN), Fiji*

Ms Gonelevu graduated from the University of the South Pacific, Fiji in 1999 with a Bachelor of Technology (Electrical/Electronics Engineering) and earned her MSc (Renewable Energy) degree in 2006 from Murdoch University, Australia. She worked as an energy specialist for the Government of Fiji, SOPAC, IUCN and SPC in the last 10 years with a special focus of implementing renewable energy technologies for rural Pacific communities.

Marshall Islands in terms of rural and outer islands electrification through solar home systems

Currently, 50% of the outer island communities' households are still fully reliant on fossil fuels and biomass for its energy services such as lighting, cooking, heating, etc. Through the North Pacific (Federated States of Micronesia, RMI and Republic of Palau) ACP Renewable Energy and Energy Efficiency Project (North-REP), RMI has been allocated a budget of \$4.5 million which will be utilized for the improvement of the quality of life on the outer islands, reduce dependency on fossil fuels and increased access of remote populations to reliable renewable energy services. North-REP is being executed and implemented in RMI by the Secretariat of the Pacific Community (SPC).

SPC (North-REP) has procured 1500 of 12-Volts (V), 220 Watt-peak (Wp) solar home systems (SHS) that will be installed in each of the households. The SHS will provide basic lighting for education, handicrafts making and other household activities that can be done at night. It can also provide electricity for basic energy services such as radio, cell phone battery charging, television, etc. Each household is required to pay a deposit of \$100 to acquire a SHS and will utilize the Government owned – monthly rent to operate at \$5 a month. In some of the rural communities of RMI, they have piloted the use of handicrafts (baskets, flowers, mats) to pay for electricity in collaboration with the Women United Together in the Marshall Islands (WUTMI). Given the challenging geographical location of the rural communities of RMI, other forms of payment will be used such as copra, fisheries, etc to pay for the monthly electricity.

A socio-economical analysis was also carried out in 1500 households to determine the baseline of the energy sources used in the rural communities, different gender roles and occupation of community dwellers and how the installation of the SHS will impact and change the socio-economical development of the rural communities.



Tomoki Kobayashi

PhD Candidate, Keio University

Tomoki Kobayashi is a Ph.D. Student of KEIO University. He is specialist in Geographic Information System (GIS) and Agent-Based Modeling (ABM) and his main research interests concern energy potential assessment and innovation diffusion modeling. He is currently working on the development of a web-platform for community-based energy planning in Kesennuma.

GIS Based Potential Assessment and Action Support

In Japan, when the supply of electric power shifted from intensive mode power source to distributed power source, photovoltaic (PV) systems were seen as feasible ways of providing households with renewable energy. However, its spread has not been promoted because of its high costs, unprofitability. And also, some of residential rooftop area is not suitable for hosting an on-site PV system because of structural, shading, or ownership issues. Therefore, community options are needed to expand access to solar power for renters, those with shaded roofs, and those who choose not to install a residential system on their home for financial or other reasons. The research questions are as follows; 1. What are the benefits of community solar? And 2. How do we set up the community-based model?

This paper approaches to construct database for grasping properties of each ward in Yokohama city.

First, we assessed the solar energy potential by constructing high-resolution and detailed database with GIS that includes solar radiation and some other auxiliary parameters. Secondly, we analyze the environmental conditions of each household. Thirdly, we survey household attitudes to community solar using web-based questionnaire. Finally, we discuss about the possibility of community solar.

According to the result, this study indicates two points of view by the results of potential assessment. The first one is that each region has different community solar potential caused by environmental conditions and social conditions. The second one is that it is necessary to give information and incentives about solar community involvements for scaling up of community-based model.



Highlights from group discussion between session members

Shinano Hayashi: from today's speakers I learned that community consensus is needed - the science community should have a language to explain ideas easily, and at the same time some financial support is also important, as is governmental support which may take the form of a tax exemption or a feed-in tariff or subsidy. But what have I missed? Can any of you give an idea of what is more important, or a personal impression you might have? Secondly, for this kind of innovation community-based energy creation is there an optimal size? Is bigger better or should we have small projects all over?

Yusuke Matsuo [speaks in Japanese]: On the first question, I think that's difficult to answer. With regards to district or community-level energy promotion, when it comes to the conditions that are necessary, it's hard to say. In the past three years I undertook research on changes in consumer behavior and I felt there were some limitations, because it's not only about awareness. Changing awareness doesn't lead to, nor feed into, changes in behavior. There are different connections, different kinds of awareness. How do you translate that into action? You need economic support. You need to create a situation where investment is recovered, and government subsidies are necessary in this connection. With regard to the community size, and this is from a totally different perspective, I did some psychological studies looking into changes in consumer behavior. I found that if you empathize with others and if you learn to help each other, the community that is ideal to promote this would be a community of 150 persons. In the past, for several millions of years people lived in communities that were usually less than 150 people, and I think that size creates bonds and is very effective.

Shoji Yo [speaks in Japanese]: My comment with regard to the first question, about the elements needed in the community everybody is motivated to change the energy mix, but what is missing are co-ordinators and promoters. The question follows, who might be a co-ordinator and I feel that it needs be people with a high level of awareness, who are motivated to learn and who have some experience. It is important to develop and nurture such people. With regards to the second theme of the optimum size, I have already mentioned this during my presentation, we have the citizens' joint power plant that we are proposing. We are conducting questionnaires just now and people

Note: Quotations are derived from recordings of the discussions and have been edited for clarity where necessary.

say that doing it alone is worrying, but if the population is too large they wouldn't know each other. There is also an optimum cost. 1000 Yen is too low and 1 million seems too high. At the same time individuals don't want to negotiate with manufacturers themselves. With all that in mind, Mr. Matsuo said 150 to 200 people is a good size, but I think a smaller level is necessary. An appropriate size is 50 or so.

Akira Taniguchi [speaks in Japanese]: With regards to your first question, since FIT (the Feed In Tariff ensuring energy price for sellers in Japan) started, I think the system is spreading in an economically viable manner, but that is not sufficient. Beyond economic value, the new model must combine social needs, for example working with city planning, and if it is the disaster area we might think about combining the system design with emergency power generation equipment in order to build acceptance. Responding to your second question, there is a difference between cities and villages. In suburban areas, there are real communities and they can be used to increase acceptance of new energy models but in urban communities do not really exist and it is maybe worth thinking about how the energy initiatives can be used to create a community.

Harutoshi Funabashi [speaks in Japanese]: If three people are serious about something, they can change their community. In Japan there's a saying that when three people get together they have tremendous wisdom. If you ask communities how they were able to succeed they say there were three people who were very serious about the project and that is what I think is needed with regards to your first question. With regard to the second part of your question, given the current institutional framework I would propose a multistage development model. The first stage is 10 kilowatts to 49 kilowatts. If it's 10 kilowatts FIT would work over 20 years. If you exceed 49 kilowatts you need a special engineer, so if you only have untrained residents then 49 kilowatts is the maximum.

On a small scale there are failures and successes in one "cycle" of experience. If you succeed in the first attempt you can move onward to a second level where maybe 100 kilowatts or more can be attempted. From there the residents can take their accumulated experience to the third stage and work on mega-solar projects. In Hachinohe City the community they are taking on a 7 megawatt project, and it is possible because of their previous experience with wind power.

Taihei Shibata [speaks in Japanese]: With regards to the conditions required, well, an indispensable condition is I think people, first of all. In Kitakyushu City we are engaged in various projects, and of course there are motivated people in the city government, but what is important is the private sector and the community residents. In each of these groups if there are people who have high motivation and intent, who have ownership of the project, I think that is a big dividing point [between success and failure].

With regard to the size of a community, frankly speaking, I really don't have the answer. I have been involved in this type of business for 15 years, ... and from our perspective basically people are all acting for themselves first. If the goal is to expand renewable energy and we are thinking about the appropriate size it is useful to pay attention to connectivity and community and if we want to strengthen that, I think 100 to 150 people



joining to make a particular power scheme may be appropriate - but in terms of energy efficiency, a larger scale would be much more ideal. In our case, in terms of business size, it is 15,000 kilowatts; that is the scale that we are engaged in and maybe that is better.

Arieta Gonelevu: ...not one size fits all, thus an integrated approach is very important. We've covered most of the issues in our presentations, but from the Pacific region perspective, in terms of renewable energy development, it's quite capital intensive right from the outset. We need big brothers, the development partners, just to start off. But something that we can commit to is energy conservation and efficiency, so this is something that we can do hand in hand with developed and developing countries. And of course there has to be political will and people have to be taught to have a sense of ownership so that we can sustain these kinds of projects.

Manushree Banerjee: We tend to include community right from the beginning, and then from the decision-making process to installation, because I think it's by the community for the community. Regarding your second question, in general it's said that smaller systems are cost-effective. Also from the point of view of management, smaller systems



tend to work better with a smaller community of end-users, they are easier to manage in terms of collection of tariffs. When the number of end-users is large there might be differences of opinions regarding tariffs, collections, and so forth, so it's always better to have a smaller section.

Audience: I think much of the debate revolves around the cost of photovoltaics energy. Can somebody update us in this group, what is the current state of research on the cost of PV and how can we expect that to decline and in what timeframe, because until that cost becomes reasonable and accessible to most of the world, we're really not going to get much installed. What we have over here is maybe ten communities or fifty communities. This is not enough.

Speaker: We have managed 250 projects in the last five to seven years. With regard to the cost, at the beginning, some five to seven years ago, when you talked about rooftops in public facilities, it was about 1 million yen per kilowatt in terms of cost and in households it was 600,000 yen per kilowatts or so. That was the price. Presently in households it's 400,000 yen per kilowatt, and in the case of megasolar it's less than 300,000 yen per kilowatt, so in the past seven years or so, and with the introduction of FIT there has been a large reduction in cost. Within this framework METI (Ministry of Economy Trade and Industry) says there will be a large reduction in cost going forward.

Ranjith Perera: I know that solar panels or photovoltaic panels have been commercially available in the market for many, many years, successfully used, effectively used in individual buildings, like houses, hotels, institutions, but why is it not used collectively so much to supply energy for communities? I think the technology is available for many years but in terms of use for a city block or a community, it is not advancing so fast. What is the barrier we need to overcome? Is it purely a financial barrier or is it about land?

Speaker [speaks in Japanese]: Speaking in terms of Japanese society, funding or financing was a huge barrier, and after the introduction of FIT, the government subsidy for solar power, instead of using a government subsidy as the main source of funds, projects began to be financed by private funds. However, the Japanese private sector is not very experienced in this area. If due diligence financing is developed like it is in Germany, the story would be quite different, but that is not the case in Japan. So I think we have to create a financing model which does not depend upon due diligence but rather from the very early stage of the projects the financial institutions should participate in the study sessions. In order to bring citizen-led energy projects to success the financial institutions should be part of the project in order to overcome this financing issue.

Audience [speaks in Japanese]: You talked about size. Small is beautiful perhaps. In the UK, from 1974 CAT (the Center for Alternative Energy) has promoted a project to develop self-sufficiency in communities, but if the size is too small it's not viable. So it's contradictory. On the one hand they're pursuing a "small is beautiful" concept, but on the other hand they're connecting to the national grid where there's instability. When there aren't that many people using energy they sell the surplus power. Which is to say in the UK they haven't come to a conclusion about the size, and I agree with you, small is good, but if you think about efficiency you have to have a certain bigness. How do you overcome this contradiction? In the Tohoku region, for whom is this solar generation system? The population is diminishing so there's no need to make more power, but they are trying to introduce the system anyway. In that sense if you try to focus on a target of production, it may lead to major failure. Similarly, in the UK they only have proper solar energy production in the summertime. In the wintertime it's not efficient. To cope with the fluctuation in available energy you have to have a flexible design; otherwise you may collect a lot of money and invest it, but it may result in a negative legacy. If you have advice from this standpoint I'd welcome your opinion.

Wanglin Yan: [speaks in Japanese] Let me address the subject of fluctuation. Perhaps this is something you're aware of. First of all I think that regional cooperation as well as hybridization is important. For example, biomass is very expensive to generate but it's capable of responding to fluctuations. In the case of wind energy, if you collaborate on a regional basis, that's possible, and then if you mix it with water power or use some other kind of hybrid system, then technologically it is possible to cope with variation or fluctuation. I think that's a good direction to pursue.

Speaker [speaks in Japanese]: CAT is attaching a lot of value to water. If the terrain is hilly then you can have water reservoirs and use the water for agriculture and transportation as well. Another important point is you tended to focus on supplying power. But with solar panels, if you use them for 30 years and if they break, you can't use them again. So maybe it's better to locate houses in appropriate places without power and then you shrink it so that you design the appropriate houses, and in the appropriate location, so you don't need to use a lot of power. Maybe you should think about the demand side as well.

Speaker [speaks in Japanese]: If you build a solar power plant that produces 2 megawatts you will need to use high-voltage lines. At the same time if you are dealing with just a single community it only makes sense to have 1 megawatt of production. METI appreciates the appropriate sizing of these systems, so depending on the region, you should produce locally and develop what is appropriate for the locality.

Audience [speaks in Japanese]: I have a comment. This session has a very interesting perspective, here offered by Miss Banerjee and her work in India. Interestingly, in India the first reason to introduce electricity was economics, and solar power was installed in the marketplace - so that people could enjoy an increase in their income. In Japan, if people can increase their income it is also an incentive to introduce something new, so that I think is common. But in Japan, what other incentives are there? Affordability is not an issue but where you find values, in the form of economics or social needs or community relationships, individualism is quite important. Do you think we can expect changes in behavior? Is something like that visible?



Session Five

**The Reality of Environmental Risk and Redevelopment
In Damaged Areas**

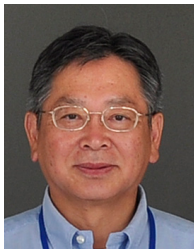


Kazuhiro Watanabe

Chairperson, Tsuchiyu-Onsen Tourist Association

Kazuhiro Watanabe runs a Japanese-style hotel (ryokan) at Tsuchiyu-Onsen hot spring, some 20km west of Fukushima city. He is the chairperson of the Tsuchiyu-Onsen Tourist Association, and the director of non profit organization Tsuchiyu-Onsen Tourist City-Planning Society. He is also the chairperson of the Fukushima City Kanko-Bussan Association and hosted the Fukushima Koderanni Festival, and is working to rehabilitate tourism in Fukushima City. Moreover, he is the president of the Fukushima Chamber of the Commerce.

Reconstruction After Nuclear Disaster and the Creation of Local Power Plants



Kazutoshi Tanoue

Deputy Mayor, Minamata City, Kumamoto

Kazutoshi Tanoue is a native of Minamata City, Kumamoto prefecture. He firstly joined a private firm after graduating Hosei University, Faculty of Social Sciences, and then entered the municipal office in Minamata city. After retiring from his position as chief of the construction department in the municipal office in 2011 he took the position of deputy mayor of Minamata city.

Recovering From The Environmental Pollution Disaster in Minamata

The outbreak of mercury poisoning in the city of Minamata (Minamata Disease) falls under the backdrop of rapid Japanese modernization and industrialization. The disease did not simply stop at its victims' lives or health; it ravaged their connections to their community and the regional economy. Rebirth and restoration took the burdens of the past and began healing by starting to restore the fundamental connections that bound the town people together.

This is a city that strives to be Japan's most environmentally efficient—one that breaks common trash into 19 different forms of recyclable components, and one whose pride and confidence in its citizenry has returned. Now, Minamata's leaders are pushing forward to bring their community closer under the banner of environmental sustainability.



Yoshiki Saratani

Mayor, Totsukawa Village, Nara

Yoshiki Saratani is a native of Totsukawa Village, Nara prefecture. After graduating from the Osaka Institute of Technology, he worked in a private firm then returned to Totsukawa Village to work in forestry. He became an assistant official of Totsukawa Village in 1993, and in 2001 was elected as mayor for the first time. Re-elected in 2005 with the slogan “home for revitalization of mind and body”, he is now in his third term.

Reconstruction and Recovering From A Typhoon



Tomoyuki Furutani

Associate Professor, Keio University

Tomoyuki Furutani is an Associate Professor of Keio University Faculty of Policy Management. He is a graduate of Keio University, and earned his PhD from the University of Tokyo, Graduate School of Engineering. He is specialized in spatial statistics, spatial econometrics, tourism, and urban transportation planning.

Technical Support for the Recovery of Radiated Areas in Fukushima



Kazunori Tanji

Assistant Professor, Keio University

Kazunori Tanji specializes in issues related to water resources, food supply issues under Climate Change, and biomass energy. He is particularly interested in macro-economic analysis regarding the trade-off between food and water security in East Asia in relation to incentive policies for bio-fuel, and is currently working on revitalization projects in Fukushima related to agricultural land after the nuclear disaster in 2011.

Supporting the Restoration of Agriculture in the Rumor Damaged Area of Fukushima City



Misato Uehara

Assistant Professor, Shinshu University

Misato Uehara graduated with Bachelor of Design in 2000, Master's degree in 2002 and Doctorate degree in 2005 from the University of Kyushu Graduate School of Design. He worked as a research assistant of Design at Kobe Design University from 2005-2007, and is currently Assistant Professor in the Faculty of Agriculture, Shinshu University. He is a generalist tackling ecological planning issues from both design and research perspective.

Could Ecological Planning Data From the 1980 Land Agency Report Have Prevented the Disaster of Fukushima Nuclear Plants in the Wake of the Tohoku Earthquake and Tsunami

R Buckminster Fuller proposed the design science in 1961 as a systematic form of designing. Ian L. McHarg proposed an ecological planning method by synthesis of evaluation respective optimal land use (non-optimal land use) at Design with Nature in 1969. These terms were introduced to the Japan. However, it had not adjusted to the Japanese subdivided administration. On the other hand, the importance of systematic design was clarified again by the damage of the Fukushima nuclear plant by Tohoku earthquake & tsunami. This presentation will focus on the reevaluation of land evaluation paper data in report of "Land Use Aptitude Evaluation Technique Investigation based on Ecological Planning" by National Land Agency Japan in 1980.



Renato Sato

Assistant Professor, Federal University of São Paulo, Brazil

Professor Renato Cesar Sato is an Economist with Master Degree and Ph.D. in Nuclear Technology Applications from the University of São Paulo. He works as Assistant Professor of Economics at Federal University of São Paulo in the Institute of Science and Technology in Brazil.

Environmental vulnerability in São Paulo (Brazil) Megacity: The transportation problem

In this research a case study of the public policies regarding transportation and its impact in the economic activity was made taking into consideration the environmental vulnerability. Urban agglomerations called megacities are a growing phenomenon. It is expected that the number of cities with more than 10 million people develop from 26 in 2012 to 60 in 2014. These massive urban centers are a unique phenomenon in the history of mankind. In 2010, about 50% of the world population lives in cities and according to the World Bank, the growing trend of urban areas should continue until 2050 with only 30% of the world population living in rural areas. This often uncontrolled agglomeration promotes a number of fragilities in the social living system, often with an action that affects environmental aspects. The city of São Paulo in Brazil is the largest metropolis in South America, with about 11 million inhabitants in 2012. The uncontrolled increase in the fleet of vehicles has become a major challenge to public policy and planning. In January 2008 the fleet of vehicles was about 6 million and in July 2012 it went up to 7.3 million. This situation created a poor quality of life and a weakness in the environmental phenomena. Effects on Climate Change may further aggravate this situation with an increase in the frequency of environmental disasters and rainfall in a short period of time. From the public policy point of view, measures like vehicular restriction and vehicle inspection only promotes a temporary alleviation, but fall short in a solution. Regarding the economic aspects, this heavy traffic currently generates a loss of about 27 billion dollars per year. In this paper we address the following issues: expansion of the number of vehicles - excessive growth, inefficient public transport, reduction in quality of life: average time travel and health problems; externality: an increase in CO2 emissions; economic impact on the city.



Shinano Hayashi

Deputy Director, Natural Resources Management Group,

Adaptation Team, Institute for Global Environmental Strategies (IGES)

Shinano Hayashi is currently deputy director of Natural Resource Management Group (Adaptation Team) at the Institute for Global Environmental Strategies. His major interests are climate change adaptation strategies in the agriculture sector and Alternative Risk Transfer (ART) schemes for risks caused by natural disaster and climate change. Currently he is conducting social and economic analyses for reconstruction following the 2001 Northeast Japan Earthquake/Tsunami and works on proposal regarding local economic rehabilitation and vitalization by implementing various financial schemes.

Financial Support for Natural Disaster/ Climate Change Affected Areas : An Innovative Approach

Although Japan has made large investment on infrastructure, agriculture, fisheries, and allied sectors, recent Earthquake/Tsunami in Northeast Japan revealed they are still vulnerable to natural disasters. Not to mention social and economic damage caused by Northeast Japan's Earthquake/Tsunami in 2011, Japan is exposed to potentially one of the highest natural disaster risk in the globe.

After emergency rescue has been major focus of activity, economic stimulation in local businesses and livelihoods is necessary along with financial support for the damage. The reason is that damaged industries no longer hire employment and without employment, disaster victims do not have options except emigrating to areas which have more job opportunity. Consequently, enhancing local economy is a key factor to build resilient society after the disaster along with physical side of reconstruction.

In this paper, the discussion focuses on innovative financial approaches such as (1) investment vehicle utilizing anonymous association, and (2) market based risk finance schemes (weather index derivative, CAT bond, etc.) as unique support tools of public-private partnership (PPP). These innovative approaches have been drawn attention in Japan after the disaster; therefore, it is important to assess the effectiveness as adaptive tools against disaster/ climate change impact.



Highlights from group discussion between session members

Hikaru Kobayashi [speaks in Japanese]: As I was listening to the presentations I found myself thinking that the need to learn about nature and to integrate what we learn into human activities is a common thread for everyone. Whether its disaster hazards or radiation this commonality remains. That said, it is extremely difficult to find the lessons from nature that we actually need and also just as difficult to gather information from communities and localities, and beyond that feeding what we do learn into human activities is still a question... I'd like to ask about these two issues, but before that since this is the only session in which we have non-academic speakers coming from districts dealing with disaster I would like to ask their opinion about a side issue, namely do academic presentations and research offer useful knowledge?

Kazuhiro Watanabe [speaks in Japanese]: Support for the SMEs in relation to the radiation issue in our area, I think that was very helpful. If you consider the tsunami and nuclear radiation as a system or from the standpoint of the government the disaster is complex. In Fukushima there is assistance to rebuild but with multiple loans on destroyed buildings banks are reluctant to offer loans to begin with. We are not in a position to formulate repayment plans yet the banks need that so loans are not forthcoming, and the private banking sector is of no use in a situation like ours. In the case of compensation of damage, maybe large factories receive compensation. There is also no compensation for the nuclear disaster but instead a kind of investment in the form of subsidies and so forth.

Note: Quotations are derived from recordings of the discussions and have been edited for clarity where necessary.

Kazutoshi Tanoue [speaks in Japanese]: I think Minamata has had a similar experience. There are different types of funds involved but they are vertical silos, a condition that is common to all affected areas. With Minamata disease, as you know, there is anthropogenic damage and that led directly to deterioration of the economy. Town development, and community development was promoted with the help of consultants, but the difference between consultant and university researchers is that the consultants will come up with plans that match our expectations while universities and other institutions will come up with plans that look to what is appropriate regardless of our requirements and that is a good thing. Thinking a bit further on that, academics working on the ground and are more in line with local needs, so that is useful.

Yoshiki Saratani [speaks in Japanese]: When we were hit by typhoon no 12, we didn't know where to start. In the end we decided to tough it out for three days because we knew relief would come on the fourth day after the disaster. While we did get relief from other prefectures and from the government, because we are in a mountainous region we know will be hit by disaster again. For instance we evacuated to the North but there were landslides in the mountains, making it dangerous. Although the central government has an observation system in place it does not take action when cracks are found, so there will be more problems. Academics undertaking research in these areas can help us to decide which areas are safer and where to invest our budget. Currently there is a budget for areas that have already collapsed, but none at all to manage areas that might be dangerous in the future. More attention should be given to people and not just engineering solutions after a disaster. In Tohoku we hear about reconstruction and restoration but I strongly feel it is better to give our attention to the people [not the physical things].

Hikaru Kobayashi : [speaks in Japanese] Thank you very much. I was involved in that sort of thing before so I keenly felt what you are saying, but you have to really experience this to understand. The overall symposium is about creating a resilient society, and that's the kind of society where preventive measures are in place. It's unfortunate that the only way to understand is to go through the disaster, but we'd like to take this opportunity to create a better world going forward. Directing our attention to the academics on the panel, can you respond to what has been said or elaborate on what you have said already?

Misato Uehara [speaks in Japanese]: I recall the Minamata disease and how frightful that was, and once something happens the impact is felt for ten years or twenty years, it's long standing. As Mr. Saratani mentioned, when it comes to preventive measures budgets are rarely allocated. Sometimes a budget is set aside, but then because of bureaucracy and sectionalism, the money isn't well spent, so in reality a proper budget only emerges after a serious accident. We need to take preventative measures, share information, and stop silo-ing ourselves in both universities and in government. I was trained in an interdisciplinary environment, but at Shinshu University the agriculture department, medical department, and science department are all physically separated, so we only realize the importance of coming together at meetings like this.

Kazunori Tanji [speaks in Japanese]: With regards to prevention, the information needed to act is perhaps available at many levels but is it used by municipalities or by communities? I think there is still a big gap. In the area we were studying there were no maps for disasters with nuclear power, but hazard maps did exist and there was some knowledge. Yet the community was not able to respond to the disaster. They had a disaster recovery plan, but it faded in memory after a number of years. The residents themselves forgot about previous disasters. So there is a need to stay motivated and to ensure information is disseminated. In a way that would mean making a DRA plan that works in “normal” times not just in an emergency. Incorporating the DRA into the routine mechanisms of key workplaces or jobs is one way for example. If that is not done it will not work.



Tomoyuki Furutani [speaks in Japanese]: So what I am about to say may overlap with what Prof. Tanji said. First of all, when it comes to big data with probability-based events like the radiation mapping I showed earlier, it takes a person who can make judgement and communicate results to the public in plain language. We need to develop human resources throughout the country. For instance if we look at the areas affected by the tsunami in Tohoku there is an observable difference between the governments that used GIS and those that didn't. The rate of reconstruction differs completely. For example, some local governments were able to develop a database of evacuees in a more efficient manner because they were using GIS data.

Secondly, Japan's population is going to decrease going forward; by 2050 the population is going to be 70 million, which is similar to Germany and France. Against such a backdrop, in the case of disasters, if a large-scale complex disaster occurs, I think we need to think about reconstruction from a different angle. We need to maintain existing communities while we rebuild, but at the same time concentrate the existing communities, which is a contradiction, and for this reason perhaps no answer has come forward yet.



Hikaru Kobayashi : Prof. Sato, what is your impression on the Japanese situation? We have lots of communities with very small populations, and those communities have been hit very hard, and now we face unusual challenges. In that sense it is quite different from Brazil, but I would like to hear your impression.

Renato Cesar Sato: Thank you very much. Well, I think listening to the small communities, one thing is definitely sure – networks matters. I think the main lesson that I could catch is that networks in these small communities were very strong and there are strong ties that keep them together during these very difficult times. One point about the reconstruction is that incentives matter, and it's very hard to rebuild

small communities because the incentive for the private sector is very limited. The government must make some arrangements and probably can make a private partnership to try to do this, introduce a tax reduction or implementing a new kind of building, which takes time. One thing is for sure is that the small communities must pay much attention to the climate change and the environment vulnerabilities in their areas.

Hikaru Kobayashi : [speaks in Japanese] Thank you. So looking at the situation, tsunami and with the sea level rise, climate change has the same kind of effect, so maybe it gave a focus as to what may happen in the future. So we don't have much time left but I would like to ask a person who has not spoken, but as was mentioned by Prof. Sato, community network is very important on one hand and also institutional issues are key too. And also monetary, financial issues also are very important. Are there any other additional points?

Wanglin Yan: Mr. Watanabe from the beginning talked about the delegation of authority in order to be prepared for disasters, and Tanoue-san spoke about shifting values, I was quite impressed by those keywords. [speaks in Japanese] But on the other hand there's another keyword mentioned by Hayashi-san, matchmaking, that also left an impression on me. Yesterday we talked about mismatching instead of matchmaking, for example the officials at the reconstruction agency are faced with a mismatch, so that is a reality. Coming back to resilience, and creating resilience, I feel that first of all the mismatch must be removed; that would be the first step. Today as we are talking about matchmaking, perhaps that is one measure to overcome the problem. In which case, what we need are more matchmakers, people who can act as connectors - mayors, practitioners, scholars should all work together to support those people.



Shinano Hayashi [speaks in Japanese]: A lot of cities are creating reconstruction plans and we're doing surveys on that. Cities have merged together and these cities, the small cities are doing well, but the big cities that have come from this merger process are not doing very well. With housing, the governments are choosing the kinds of properties that were popular during the days of the bubble economy in Japan, places that are prone to floods or places where mountains were raised to build homes. Maybe it is the experts who are giving rise to the mismatch.

Session Six

Discussion for further collaboration



Highlights from group discussion between session members



Wanglin Yan: Professor Andries Jordaan gave us the keynote speech and it took him three days to get from South Africa to Tokyo. This is a globalized world but still if we want to move physically it takes time, so we are very appreciative of his participation and especially hearing the latest information on Africa, the opportunities, and challenges. Knowledge for Africans is the most important thing, and this means perhaps there are opportunities for Japan, to go to the African continent and take what they know. But I'd like to add another word: action. More important than ideas is the will to carry them out. In session one the topic was Data Tours and Narratives, but nobody addressed the issue of the narrative. It is a kind of difficult word....meaning not only the tool, not only the information, but instead is about a story. Every researcher must be a storyteller, to create scientific output that can be understood by the people who need it, the policy-makers, or the farmers and herders who in fact really appreciate what we are producing. But we don't have the knowledge and skills to produce this kind of information. That is a challenge.

Masataka Watanabe: A major discussion point was, first of all, adaptation for what? Adaptation for climate change? Or for something else? There were many opinions but the main point is that we are adapting for resilience or to deal with vulnerability caused by climate change, and in this respect vulnerability is not only a climate issue but it's very much related to social problems, and therefore resilience has to be tackled not only through scientific issues but also social issues. We also discussed how to evaluate the effect of adaptation and questioned the difference between a development project and an adaptation project. Most of the cases overlap each other, but still it's very

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important to identify the effects of adaptation, and that's a kind of added value on top of development; in this sense it is very important from the point of view of reducing vulnerability as well as funding and financing. Finally we asked what is the green economy? Trade-offs are not enough and probably we have to consider economic development under the condition of ecosystem services availability, which is a very severe constraint for economic development and so we can see that the green economy is deeply related to adaptation issues

Wanglin Yan: Session 2B was really fantastic, with speakers from different departments of the government and local communities, and each person had a perspective. Tokutaro Hiramoto, a businessman working at Nomura Research Institute - the most prestigious think tank in Japan - gave an overview of the World Bank, the EU, and other large organizations, and explained how they deal with adaptation in terms of international aid to developing countries. The conclusion of course, his conclusion is that adaptation is a kind of business chance. Building on that conclusion Mr. Nakayama from the ministry of economics and industry described an action program designed to encourage Japanese companies to go to developing countries with adaptation-based businesses. I think it's quite new for the Japanese government and for any country, to treat climate change as an opportunity, not only for researchers but also for businesses in the private sector. Mr. Tanaka, a young official from the Reconstruction Agency told us about mismatch. Working in the Tohoku area he was busy managing the information he was getting, and sometimes it was mis-information. Returning to Tokyo his job was to sort through the confused situation of needs and supplies. How to dissolve the mismatch is his mission too. Professor Perera showed how vulnerability depends on different groups, genders, age to people, and children. That impressed me very much because vulnerability is not only about the location but also the different ...personalities.



Yasushi Ikeda: Daniel Aldrich showed us that maybe a close-bonded community will work better than physical methods [of reconstruction] such as building embankments or finding architectural solutions. That is a very heavy possibility for the other presenters of course. In the roundtable discussion his question was mostly answered. The architects presenting in the session all are creating some kind of social relationship in addition to building and design. Maybe building in co-operation with residents as they recover from disaster is also an effective way to grow communities.

Shinano Hayashi: The science community should explain to the public in the communities why [renewable energy] systems are needed and how they work and the cost and benefit analysis. At the same time government support is really needed. Since most of these technologies are capital-intensive ... at the early stages money is really important, and therefore government support, in the form of feed-in tariffs and subsidies, are really necessary. At the same time, as the case study in India pointed out we are always talking about the supply side of innovative energy systems, but the demand side is important too.



Hikaru Kobayashi: Because there is economic stagnation after a crisis there needs to be reconstruction but also the resolve to rebuild a new type of community. Rather than restoring to the previous state revitalization that builds a new community is necessary. Deputy Mayor Tanoue of Kumamoto and Minamata City made a very good point that while a disaster damages a community profoundly the truth is that it is not possible to prepare for every hazard, and so it is more important to be quick to respond. For myself I was involved in environmental administration and I know from experience that government regulations are always designed too late and this exacerbates the impact of disasters,

but we cannot keep complaining. Instead we need to convert the damage into something positive. That was the example of Minamata City. In a similar vein, the mayor of Totsukawa Village asked what does it mean for a village to exist? Protecting mountains means the rivers are protected, which is a lifeline for the community. That saves lives. Protecting the village leads to protection of the planet. Interestingly, he pointed out that while there was information available [that should have been acted on] it was difficult to use in practice when it comes to prevention. On the other hand, although there were various challenging situations, the solidarity of the community meant that most of the villagers were able to survive several days without any transportation and without any information. Without good ties between people it will be difficult to overcome a disaster.

If I may share with you some personal thoughts, we need to learn about the environment and reflect what we learn in the behavior of people. I think that was a common thread amongst the different presentations.

Kang: As an ecologist I think of the concept of resilience, which as far as I know was first introduced [in my own field] by C. S. Holling in the early '70s. I believe a resilient system needs diversity, and so a resilient system has a certain amount of intrinsic complexity, both structural and functional. The other important concept in the resilient system is functional redundancy, but the question is ... how can functional redundancy be valid in the social sector or economic sector, and if functional redundancy IS valid, then how can we use it in practical ways?



Ranjith Perera: I think it is a very timely topic - innovation for resilience and transformation. What struck me was the idea of capacity or incapacity. We have heard about technology transfer or more recently knowledge transfer to increase capacity in other countries, but I think what emerged from this discussion is the transfer of capacity itself. Here the capacity can refer to technological capacities, financial capacities, human resource capacities, and many richer countries try to improve the financial capacity by, say, ODA. But we are in an age where the ODA assistance is disappearing in a very big way. It's not only Japan. I think many developed countries in other parts of the world are reducing their ODA portfolios and they are looking at other models of assisting countries with lesser capacities to face climate change and improve their resilience. Within this context the most interesting idea that I heard in the whole symposium was in the session that I also participated in. The gentlemen I think from the ministry of economic affairs talked about involving the private sector, especially the companies which already have some technology to transfer to other countries. Technology transfer we have heard over many decades now, but the potential in this instance is to link the private sector, private companies, with resilience-related technologies. Proven technologies are linked with social enterprises in other countries because the private sector will not go without a profit motive. And on the other hand, in countries where the financial capacity is smaller, affordability or break-even rate of return, are the challenges for them to handle. In this case the role of the national government's is to bridge the gap with say, government subsidies. These can be directed to social enterprises to make the technologies affordable and more effective for those who really need them. Without that support we are talking about selling technologies to countries with lower capacity, which may not work in the short run.

My last comment is about the parallel session; that was the only parallel session we had. In fact I wanted to be in both places so I was running up and down and in doing so I missed some important sessions, but I think the session upstairs did not receive enough attention, although it was one of the most interesting personally for me, because again they showed quite a lot of very practical examples, like the examples in Kigali. I was really impressed by the works of the participants here and I think it needed a little bit more exposure, so maybe next time try to minimize parallel sessions.



Pervaiz Amir: First of all I'd like to congratulate the organizers. I've done many types of these symposia and conferences on an annual basis. I think the human element which I see over here in this particular symposium somewhat differentiates this symposium from some of the other activities in which you participate. And the recognition of community, I think that is at the core, and normally we do a lot of talking in these coops and other international meetings but we rarely get down to earth to the actual real-world type of problems, so I think you all need to be congratulated on that.



Secondly, I think we have taken the word innovation one step forward. The way I look at it, starting from Dr. Jordaan's opening of this symposium in Africa, to Asia, and maybe lesser developed parts of Asia, like South Asia, I think there is a great element of cross-fertilization of ideas. A lot of the things which were presented here, they might appear to be too simplistic at times when you talk to the business community or you talk about the community...but there is a lot of information which we can take back. Maybe we can't take back the technology but we can definitely take back some very key ideas. And I for one in South Asia feel that I can sensitize a lot of people at the highest level of government to incorporate some of these ideas.

Lastly, I think there is also a strong influence of this type of symposium on issues of methodology. One thing which I picked out of this whole thing was that, yes, adaptation versus development. If I am doing a development project and if I am doing an adaptation project, how do I differentiate these two in terms of my evaluation portfolio, and I think that will probably have some implications, go back to EDI, to the World Bank or somebody, and somebody really needs to academically start to look at some of these very serious questions which we really did not realize because we didn't have this problem. It's only now when we start looking in terms of differentiating between mitigation, adaptation, and development that this type of thing is important.

Masataka Watanabe: I think the challenge we are facing now is that community-based or social capital-type evaluations are very challenging, and particularly when we talk about the evaluation or the effect of adaptation and differentiating it from the development planning. I think those areas are missing and huge demand exists, particularly in Asia.

Renchin Tsolmon: Thank you for organizing such a wonderful workshop. As I am a researcher and a university professor, I learned and experienced many things such as data tools and availability. And also, one of the impressive things I found from this conference is the combination of discussions with local enterprise, the mayors from villages as well as scientists. Because Mongolia is now a country in transition, we really need such communication between scientific, social and community leaders, and before I came I had no concept of the relationship between governance and society, between the village and science.



Andries Jordaan: I am impressed with the interdisciplinary nature, where you bring the social sciences, the ecologists, environmentalists, the economists, the building sciences, architects, the private sector, as well as society, and in a sense the politicians through the mayors together in this symposium. I think this is what we need and I would really like to congratulate you because that was really fruitful, the fact that we could share around a common theme.

There are a few keywords I think that are important that stand out during this conference.

Adaptation. We didn't say much about coping, which I think is a good thing because as long as we cope we're always under stress and we need to move beyond coping, but we will always have, as was the case during the disaster last year, a period of coping, when what we need is to adapt. Maybe a stronger word...is to transform, because when you cope you're making a single step [but] when you transform, you transform maybe a whole society, you transform systems... and that is a challenge. In certain cases we need to transform what we are doing entirely. In other cases maybe coping and adaptation are enough to continue.

It was also highlighted that we are not only adapting to climate change but we are adapting to different hazards, different challenges. I'm very glad that we didn't focus only on adaptation to climate change because there are a lot of other areas that we experience on a regular basis, that society experiences, where adaptation is necessary. We cannot just focus on climate change alone.

Other keywords including ones along the line of change, new ideas, doing things new, risk, innovations, and finally green economy. In environmental economics for many years we were talking about weak and strong sustainability, and in a sense green economics is strong sustainability, where you need to consider all elements. As for the need for a green economy to begin with, personally I think we will still argue for another ten years about the desirousness of it....I think especially in the developing countries you will find that people will have the argument that we first want to develop our country and our economy with cheap and dirty technologies - which is in some cases a valid argument. I think we should listen to these arguments but we will have these two sort of opposing views.

There are also a lot of opportunities in developing countries. I am specifically thinking about the idea of a smart community. In developed countries we already have systems and networks to distribute power, so that all communities basically have access to power, which is not the case in developing countries, and it might be easier to start with this idea in developing countries where we have decentralized power generation, and I think this is a big opportunity which we can start implementing.

Energy. We said a lot about energy. I think that's very important. Agriculture and food security was mentioned here. The building and the design of new cities, it was interesting for me, it was mentioned last night that in Japan you're looking for plans of what to do with the surplus accommodation because

of the shrinking population. I was thinking maybe we should design ships to move some of these big buildings over to Africa and other developing countries where we need accommodation. In developing countries we need to design for big megacities while you have another challenge in the developed countries.

And then it was also mentioned the need for a holistic approach where we need to look at all aspects in society to overcome some of these challenges.

The issue of communication, of transforming our ideas of innovations, new technology, to the users, to the end users, to the consumers, was also mentioned. I think that that's an age-old problem between scientists and the consumer and we need to address that to make sure that people are not only aware of the ideas that are out there but that they really start implementing them.

We end this session today with a response which was quite interesting. Specifically for me I always use Japan for my students as an example of how well they are organized, how well they manage to adapt, thinking of Kobe, what happened after the earthquake in terms of new designs, new buildings, et cetera. And even now a number of my students were here during the response of the tsunami last year and they reported back how well the disaster management and the disaster response system was organized in Japan. And it was interesting for me that even though that was the case, it doesn't matter how well we are organized, when an exogenous shock of that magnitude strikes us, we will remain disorganized.

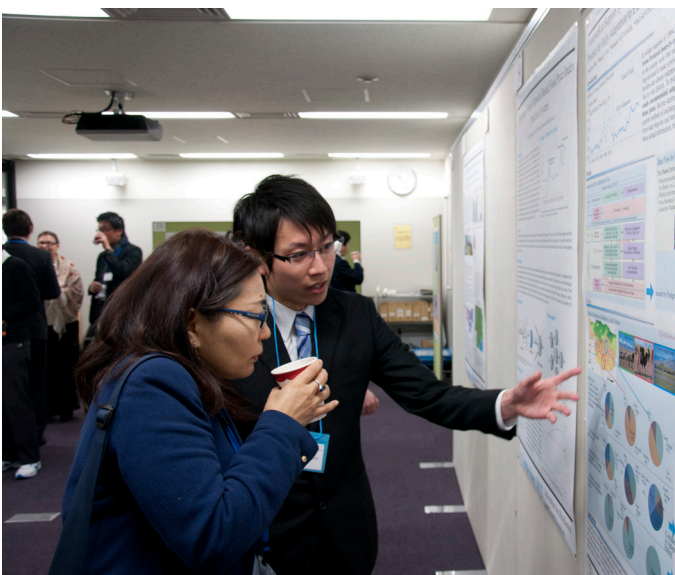
Maybe we should start designing our contingency plans now, so that we have contingency funds available, and contingency support ready, so that we can respond without needing permission from the treasury and going through [time-wasting] paperwork.



Posters and Displays

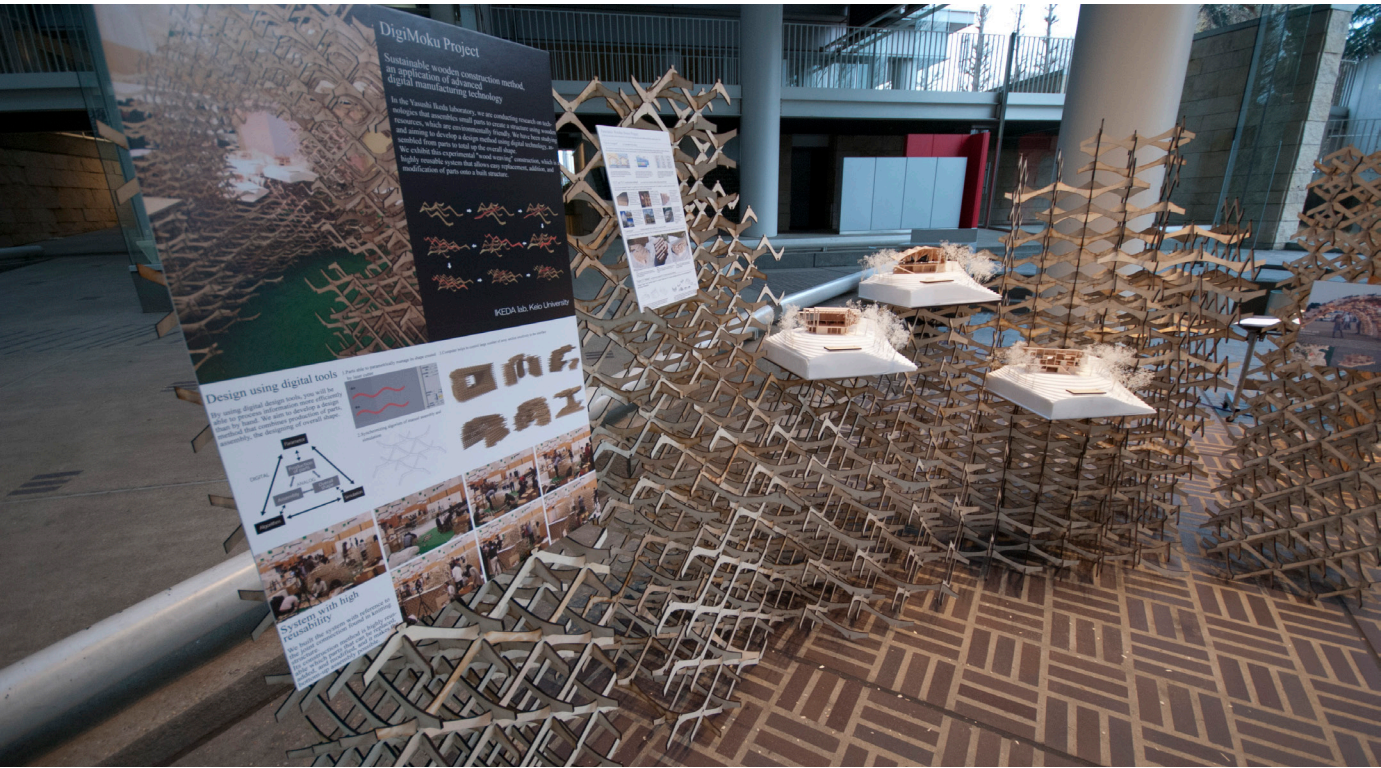
Poster Session Participants

Volkov Dmitry	<i>Combined wind and solar power installation with superconductive elements</i>
Kyungsun Lee	<i>Transition toward Sustainable Chemical Industry in Asia: A Socio-technical system approach to Green Chemistry</i>
Jesse Hsu	<i>Building Resiliency through the Repurposing of Spaces and Institutions with Urban Agriculture: Examples from Honolulu, Hawaii</i>
Akihiro Oba	<i>A Framework of Support Systems to Bridge the Gap between Policy and Practice for Early Adaptation to Extreme Weather in Mongolia</i>
Tomoki Kobayashi	<i>Agent-Based Modeling to Assess the Potential of Community Solar in Urban Areas</i>
Matthew Jones	<i>Climate Change and Cultural Heritage in Japan: A Case Study of Itsukushima Shrine</i>
Muriadi Arip	<i>Flood and Vulnerability to Undernourished Children and Infant/Maternal Mortality: A Case Study in Sambas Regency, Indonesia</i>
Obed Milton Simamora	<i>Land-use change of small scale registered-land in Indonesia: A study in Bantul Regency</i>
Shuichi Okabayashi	<i>Study of FFPI Prediction Model for Future Food Security - A Neural Network Prediction System</i>
Junjie Xue	<i>The Impacts of Sidewalk Vendors on Urban Amenity in the Cities of China</i>
Yupeng Zhu	<i>Development of Public-participated environmental pollution prevention system in China</i>
Qiming Qin	<i>An Economic Framework for the Construction of Eco-Smart City in Shenzhen of China: A Comparative Study with Yokohama City, Japan</i>
Li Yuan	<i>Research on the Policy of Agriculture Non-point Source Pollution Problem in the Taihu Coastal Area in Suzhou City of China: A Comparative Study with Biwa Lake, Japan</i>
Lin Yun Chu	<i>Impacts of Gentrification on Sustainable Development in Urban Planning: Case Study in Taichung City, Taiwan</i>
Shenyan Zhang	<i>The relationship between wetland ecosystem restoration and the Elaphurus Davidianus reintroduction</i>
Wenbo Chen	<i>The Tibet Sketch Book – Himalayan Fieldwork in 2012</i>



Environmental Design Exhibition

Digital Wood Project	Yasushi Ikeda Lab and Shohei Matsukawa Lab - Azusa Ino, Sojune Ahn, Katsuya Kawabata, Masaya Shimizu, Akihiko Tanigaito, U-ichi Abe, Shuta Takagi
Veneer House in Tohoku	Hiroto Kobayashi Lab - Wataru Doi, Akiko Noguchi, Nanako Hirano, Kazumi Masaki, Liliko Mizukami, Feng Yuqiao, Yumi Goto, Asuna Segawa, Charles Lemonnier, Ayako Oda, Katsuya Kawabata, Naoyuki Sasaki, Toshiko Shibuya, Yoko Tatemoto
ACADEX Primary School Project in R.D. Congo	Hironori Matsubara Lab 2012 Participants - Kazuho Ando, Yoko Tatemoto, Yasushi Nishiyama, Keita Kajihara, Yukari Ueno





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the Asia Pacific Adaptation Network (APAN)



