

# Flexibility, Endurability, and Peace

TAOYAKA Newsletter

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TAOYAKA



TAOYAKA Students visiting a mountainous area in Shimane Prefecture – May 2014

## *Be a driver!*

### *Message from Hidenori Okahashi Program Coordinator*

**T**AOYAKA Program for creating a flexible, enduring, peaceful society was inaugurated in October 2013. Over the past half year, we have been engaged in preparation for admitting



Hidenori OKAHASHI  
Program Coordinator

new students. It was a struggle to build the education program with a new concept of being a university-wide, cross-cutting program; however, the program made favorable progress with the efforts of everyone involved, and we welcomed the first generation of 7 new students in April 2014. I deeply appreciate the cooperation of all the people concerned.

Classes have already begun. In the “Onsite Course Rotation” class which all the TAOYAKA students attend, the students discuss concepts

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of their future research and visit fields off-campus. Ms. Hao, one of the TAOYAKA students, told me her impression on visiting the mountainous area in Shimane Prefecture as part of the class:

*It was a wonderful excursion. I could not imagine the depopulation and aging of the mountainous region until I went to Tani village. There were only ten people who still live there. However, it is a big surprise that they can organize their life so perfectly with vegetables, rice, fish, and fresh fruit. And the landscape is very beautiful and peaceful. I was very happy to go there, and I hope we will go back there one day.*

Here, she expressed her genuine surprise and joy to know the present situation of a Japanese mountain community for the first time. What TAOYAKA students feel, see, and think on-site will become the fundamentals of their studies. I hope TAOYAKA students will endeavor to visit sites, feel many different things, and make discoveries.

I wish to look back at the features of TAOYAKA Program here, to abide by our original purpose.

### **1. An interdisciplinary program including Liberal Arts and Science**

TAOYAKA Program requires students to have expansive ways of thinking based on broadening

interest as well as knowledge in specialized disciplines, in order to challenge and resolve issues that regional communities confront. The program is different from a conventional, discipline-based education that focuses on studying one discipline. TAOYAKA Program is comprised of three courses, and both students and educators need to strive to work past the differences among the courses.

### **2. On-site Education – Fieldwork**

TAOYAKA Program focuses on “disadvantaged areas” as the fields of education. Upon visiting such fields, it is not appropriate to assess the situation based only on the knowledge that has previously been learned. Rather, students will be required to communicate with people living in the areas and find ways to have sympathy with them. Students will make a discovery through the experience, and will find the issues of the areas independently.

### **3. Reverse Innovation**

An innovation conceived and driven by culture is the core of TAOYAKA Program. Thus, it is important to do away with fixed ideas and challenge ourselves to have unconventional, flexible thinking. With the above-mentioned features of TAOYAKA Program, I strongly hope that students as well as mentors will play



active roles as individual “drivers,” – as in the title of this message “Be a driver!”

The following are my expectations inspired by one of advertisements of MAZDA Motor Corporation. First, be a person who drives by oneself and enjoy the driving. Each of you needs to decide independently on an end goal (that is to say, a research plan or career path) in this program, and make steady progress toward the destination while following the rules. You cannot plan to be on the same ride as someone else. Second, be a driver as a “promoter.” Individual effort toward one’s objective is naturally expected, and I also hope individual students become “driving forces” to improve the level of TAOYAKA Program as a whole. I believe becoming such a driver is necessary for Global Leaders who TAOYAKA Program aims to foster. Let’s drive together to realize a society of coexistence.

## **News**

*TAOYAKA Program's Top Stories: October 2013 – April 2014*

**October, 2013** – TAOYAKA Program for creating a flexible,

enduring, peaceful society was selected as “Program for Leading Graduate Schools” by Ministry of Education, Culture, Sports, Science

and Technology (MEXT), as a multidisciplinary model – multicultural coexistence.

**November 8<sup>th</sup>, 2013** – TAOYAKA Program held a seminar on “Expectations on Collaborations among Industry, Academia, and ODA.”

Participants actively discussed topics including: “Collaborations in Industry-Government-Academia networks that encourage small and medium enterprises to utilize Official Development Assistance (ODA),” “Fostering human resources who can work globally through university educations,” and “What industries expect from university education.” The collaboration between universities and small and medium enterprises in ODA projects was also discussed. This will be beneficial in several ways, such as the development of developing nations, internationalization of universities, diversification of small and medium enterprises, and economic development of Japan. High expectations were placed on future doctoral degree holders whom Hiroshima University’s educational programs would foster.

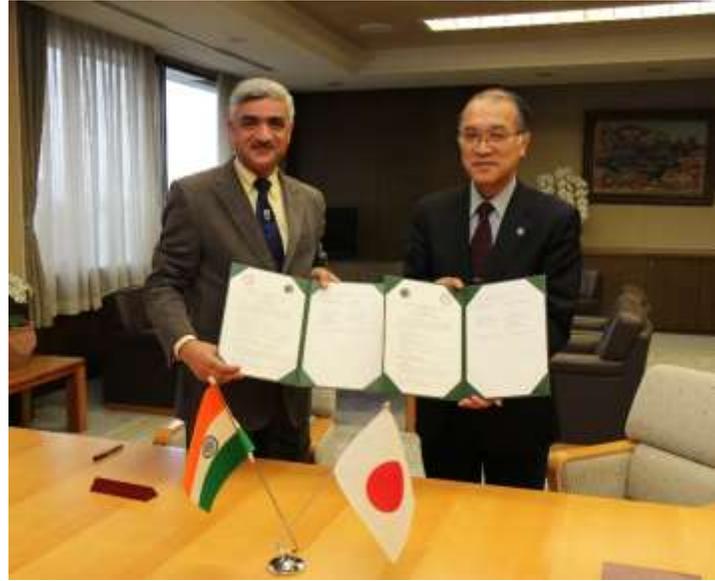
**December 2<sup>nd</sup>, 2013** – TAOYAKA Program held the Inauguration Symposium at the International



Mr. Abser Kamal and Mr. Govind Raj Pokharel  
– December 2<sup>nd</sup>, 2014

Conference Center  
Hiroshima, Hiroshima  
City.

The opening address was given by President Toshimasa Asahara. Following the opening address, Dr. Mutsuhiro Arinobu (Comptroller, the University of Tokyo) gave a keynote speech focusing on Reformation in Graduate schools’ education and the Program for Leading Graduate Schools. TAOYAKA Program’s Program Coordinator Hidenori Okahashi (Professor, Hiroshima University) gave a presentation to explain the outline of TAOYAKA Program. Three professional mentors from collaborative institutions spoke about their expectations for Collaboration with Graduate School Education. The professional mentors who gave the speeches were: Mr. Abser Kamal (Managing Director, Grameen Shakti, Bangladesh); Mr. Govind Raj Pokharel (Executive Director, Alternative Energy Promotion Center, Nepal), and Mr. Mamoru Yamada (Micron Memory Japan, Inc.). The final event of the meeting was a panel discussion, in which the professional mentors and TAOYAKA Program’s members discussed “Necessary leadership to create a TAOYAKA – flexible, enduring, peaceful – society.” The panelists actively discussed the possibilities and future tasks – specifically, how to build systems for future collaboration, what competences are necessary for students, and how organization of the educational program works. The panelists agreed on the importance of establishing the program’s satellite offices overseas, conducting



educational activities and training not only on-campus but also overseas, and preparing to collaborate in on-site activities. The panelists expected the collaboration between Japan and foreign nations will develop into effective interactions.

**March 18<sup>th</sup>, 2014** – Agreement on Academic and Educational Exchange between Indian Institute of Technology, Delhi and Hiroshima University has been concluded.

Prof. Shibana K Koul, Ph.D. (Professor and Deputy Director, Indian Institute of Technology Delhi (IITD)) and Prof. Amalendu Bhattacharyya (Emeritus Professor, Jaypee Institute of Information Technology) paid a courtesy visit to President Asahara. The visit was made to exchange opinions on establishing an academic and educational exchange between the two educational institutions, and to conclude the Agreement on Academic and Educational Exchange between the Indian Institute of Technology, Delhi (IITD) and Hiroshima University. IITD and

Hiroshima University have been in collaborative research and academic exchanges through Compact Modeling of Semiconductor research led by Prof. Michiko Miura (Professor, Graduate School of Advanced Sciences of Matter). In future, IITD will act as a counterpart for TAOYAKA Program in educational and research activities in India. IITD is expected to collaborate in joint researches in technology and science, support of students' research in India, internships, lectures, and exchange of students, faculty members and administrative staff. In light of this opportunity, Prof. Koul and Prof. Amalendu visited Graduate School of Engineering, Research Institute for Nanodevice & Bio System (RNBS), Graduate School of Advanced Sciences of Matter, and Graduate School for International Cooperation and Development to explore the facilities, where they held a seminar and exchanged opinions with members of Hiroshima University.

**March 21<sup>st</sup>, 2014** – TAOYAKA Program held the Third-Party Evaluation Committee meeting at Rihga Royal Hotel Hiroshima, Hiroshima City.



Third-Party Evaluation Committee Meeting, March 21<sup>st</sup>, 2014

The purpose of this meeting is to seek evaluations of the program's progress since it was established in October 2013. Members of the Third-Party Evaluation Committee are: Mr. Hiroshi Kato (Director, JICA Research Institute); Mr. Akihiro Kinda (President, Inter-University Research Institute Corporation National Institutes for the Humanities); Mr. Akira Sudo (Director, Representative Executive Officer, Corporate Senior Executive Vice President, TOSHIBA CORPORATION); Mr. Itaru Yasui (President, National Institute of Technology and Evaluation (NITE)); and Prof. Toshifumi Yada (Emeritus Professor, The University of Kitakyushu). At the meeting, TAOYAKA Program members made reports on the program's administrative system, admission of new students, and features of the program's education. Questions were raised by members of the Third-Party Evaluation Committee, and both the members of the committee and TAOYAKA Program had an active exchange of opinions.



**April 3<sup>rd</sup> 2014** – TAOYAKA Program held the 1<sup>st</sup> opening ceremony.

The first generation of students, 7 students from Japan, China, Vietnam, Indonesia, and Bangladesh, were enrolled into the program. At the Opening Ceremony, President Asahara delivered a Presidential Address and gave encouragement to the new students:

*Those who start this program today have had different careers and educational backgrounds in various fields. Some of you have already studied in a master's program, graduated from other universities, had a full-time job, or have been working actively as a professional in foreign institutions. From now, during the next 5 years, I expect all of you to study hard in order to be a global leader and work globally.*

Following President Asahara's address, TAOYAKA Program's Program Director Masaki Sakakoshi delivered a greeting. The 7 new students aim to become global leaders to promote the creation of regional societies of coexistence by collaborative work with other fields of studies through TAOYAKA Program.

# Introducing Academic Staffs

## Cultural Creation Course

**Chin Lin** (Special-Appointment Assistant Professor)

Affiliation: Graduate School of Letters

I am now working in the Cultural Creation course of TAOYAKA Program at Hiroshima University. I come from Fujian province, a famous oolong tea producing area in China. My hometown is located in the northwest of Fujian province, an inland rural area with a poor transportation infrastructure. I grew up there, and had good memories of playing with my childhood friends. However, the town has changed significantly since I entered the university. First, the young generation, including my childhood friends, who did not go to universities, left the village to search for jobs in cities. Second, although the landscape in the rural areas remains nearly the same for a long time, the landscape in cities has been changing sharply day by day. These

phenomena in rural China impressed me very much, and were the main reason for me to major in human geography at Hiroshima University.

Human geography focuses on the relationship among people, place and environment. One of the main contributions of human geography is to examine and solve social issues in disadvantaged areas. It is, therefore, very well matched with the mission of TAOYAKA Program. In my study, I mainly focus on the transformation of employment opportunities in rural areas, mostly disadvantaged areas in China. Since 1978, the development of China's economy has widened the economic gap between urban and rural areas. This gap has led to significant changes in rural social and economic conditions in China, such as low productivity of

agriculture, devastation of rural areas, and poverty of farmers. These issues were the result of the mass surplus labor in agriculture created by agricultural land limitation. This is important to examine to



understand the relationship between employment conditions and rural transformation. Therefore, my study attempts to investigate the features of economic development and how the development affects the changes in employment structures in inland rural areas of Eastern coastal China. The findings indicate that these rural problems can be improved by the economic transformation that has started since 2000. The economic development of inland rural areas in Eastern coastal China has led to the differentiation of employment structure of farmers. The differentiation suggests that farmers can obtain off-farm jobs not only in urban areas but also in rural areas. This transformation of the employment structure is believed to be the appropriate approach to solving such rural problems. My study, however, mainly focuses on the transformation of inland rural areas in Eastern coastal China. Because rural areas are diverse in their development conditions, more case studies about other areas are also required to obtain a concrete understanding of the transformation and challenges in rural China.

In addition to the study in rural China, I am also very interested in the study of the disadvantaged areas in developing and developed countries



An inland rural village in Fujian Province

such as South Asia and Japan. This is one of the main research focuses in TAOYAKA Program, and a very important feature that attracted me to

join it. As a young researcher, I would like to play the role as a bridge between the professors and the students, and contribute to the

development of students in the program.

## Niraj Prakash Joshi (Special-Appointment Assistant Professor)

Affiliation: Graduate School for International Development and Cooperation (IDEC)



It is a great pleasure to introduce myself as a member of the TAOYAKA Program, a program for creating a flexible, enduring, peaceful society, at Hiroshima University. I am **Niraj Prakash JOSHI**, a member of the cultural creation course under the TAOYAKA Program. I pursued my PhD from the Graduate School for International Development and Cooperation (IDEC) at Hiroshima University, majoring in Agricultural/Rural Economics. Poverty, food insecurity and environmental stresses were some of the issues I dealt with during my PhD research, and my work continued to revolve around the same issues even during my professional career as Assistant Professor in IDEC,

Hiroshima University, as well as during my time as Research Coordinator in Nepal Engineering College, Pokhara University, Nepal and again as Assistant Professor under the TAOYAKA Program, Hiroshima University.

Willingly or unwillingly, poverty – whether it be income poverty or food poverty i.e., food insecurity – remains as an important culture in the disadvantaged regions in South Asia in general and Nepal in particular. It is the culture that hinders the upward social mobility of the poor, restricting their access to very basic necessities such as education, drinking water and sanitation, and quality food, *inter alia*. Thereby, with the lack of not only the physical and financial capital, but also human capital, social capital and most often restricted access to natural capital, which is further aggravated by environmental stress, they are trapped into the vicious cycle of poverty and put into destitution. Hence, the culture of

poverty also divides society between haves and have not, thus remaining as the critical source of conflict around the globe and more particularly in disadvantaged regions, causing threats to global peace.

With this background, I have been involved in the research of poverty culture, especially a culture of rural poverty in Nepal. The vast majority of poor reside in geographically isolated mountains and hills, devoid of basic infrastructure such as transportation, electricity, communication, health, education, etc. They are dependent on their traditional source of livelihoods, which are predominantly natural resource based. Identification of technology that best suits them will be crucial in dealing with the culture of poverty more efficiently. Hence, I will be contributing suggestions for the need for technology, in particular to sectors which are based on the strengths and weaknesses of the people suffering from the culture of poverty, in such a way as to build the technology that best suits the local context, thereby facilitating reverse innovation. In addition, I would be interested in researching the impact brought about by the implementation of such technology to the culture of poverty.



## Fengwei An (Special-Appointment Assistant Professor)

Affiliation: Graduate School of Engineering



I am Fengwei An, from Qingdao city, China. Before coming to Japan, I worked for an IT company after graduation from university. I received my master and PhD degree from Hiroshima University, Japan, in 2010 and 2013. My research interests include hardware architectures for intelligent applications and real-time image processing VLSI.

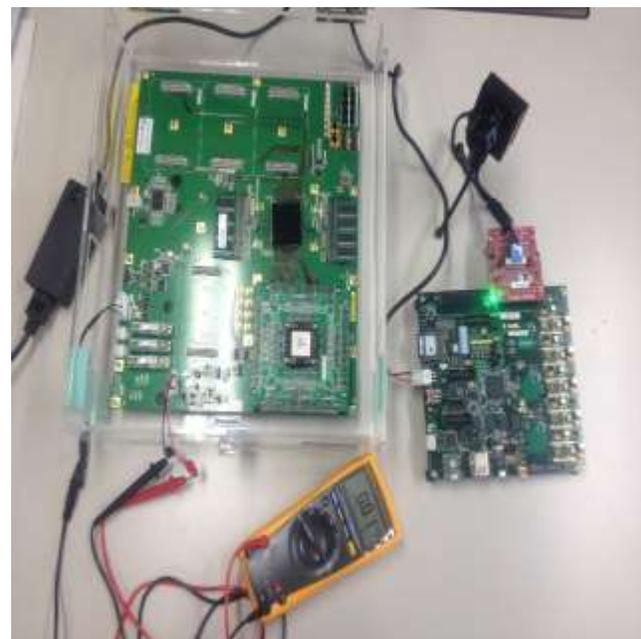
The VLSI implementation for realizing machine learning algorithms for pattern recognition or artificial applications offers significant efficiency. The real applications require high flexibility of hardware implementations of learning algorithms. Such flexibility is particularly important whenever a learning system has to be applied to a set of different applications.

Artificial neural networks and fuzzy systems are the most popular learning algorithms in hardware implementations. Unlike neural-network approaches, Support Vector Machines (SVMs) use structural risk minimization so that SVMs often

outperform neural networks in practice. For this reason, the hardware implementation of SVMs also seemed attractive in the past decade. A hardware-friendly learning algorithm is the common requirement of all hardware implementations. In order to reduce the cost, power consumption, etc., hardware-friendly neural networks and SVMs must be simple enough to adapt to the constraints of the hardware. For instance, the mathematical operations, which are easy for the software to implement, are often difficult for the hardware. My study is mainly on developing the hardware implements of machine learning algorithms which have excellent performance, high flexibility, short recognition time, good recognition rate and versatile functionality.

I plan to develop a maintenance system for human residence and power supply in disadvantaged regions based on sensing technology. The conflicts between human and wildlife are common, especially in disadvantaged regions, and have become a significant problem throughout the world. For example, attacks on humans usually occur in mountainous regions of Japan and India. In fact, during 1990-2008, it is said that a total of 309 human death and injury cases were caused by wild boars in five states in India. Besides the attacks, crop

degradation is also a serious problem. In Japan, crop deprecation leads to 22.6 billion yen losses every year. The wild boars and deer which cause 14.5 billion yen losses are the most dangerous. Wild animals also cause traffic accidents and give residents psychological burden. The NHK reported a case that wild boars had occupied Fukushima nuclear power station evacuation areas, and residents could not go home. Wild animals are fighting for food and habitat with people, so developing methods to mitigate these conflicts is vital. A lot of solutions have been proposed but have had little effect, so that annual crop deprecation losses remain almost unchanged in the last ten years in Japan. In my study, I plan to build an animal recognition stand-alone system which can protect lives and property effectively. The goal of this maintenance system



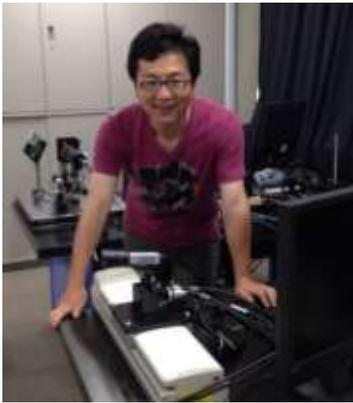
is real-time animal recognition and localization. The system has three parts: a recognition subsystem, a self-power system (solar energy), and an emergency warning subsystem. In real applications, the

system should have low power consumption and automatic failure detection. Accordingly, the solar energy and a battery-management system which improves the storage lifetime and reliability of batteries

also plays an important role in this system. For achieving high accuracy, the hardware-friendly classification algorithm is the main goal in my research.

## **Qingyi Gu** (Special-Appointment Assistant Professor)

Affiliation: Graduate School of Engineering



In order to establish high-speed robot senses that are much faster than human senses, we are conducting research and development of information systems and devices that can achieve real-time image processing at 1000 frames/s or greater. As well as integrated algorithms to accelerate sensor information processing, we are also studying new sensing methodologies based on vibration and flow dynamics; they are too fast for humans to sense. We are promoting research by participating in joint industry-academic projects with companies for online measurements and control at manufacturing sites, and joint projects with biomedical researchers for behavior mining of biological behaviors that are too rapid for the human eye to detect. We will establish hyper-human technologies as advanced

technologies to better human life through joint researches in various application fields.

To establish a safe and secure society in underdeveloped areas or countries is a very important step for human civilization. However, rugged environment and poor infrastructure in poor countries limits the deployment of the latest technologies, which can improve people's lives in all aspects. Thus, scholars from different subjects feel obliged to explore ways to help peoples in underdeveloped areas or countries by applying the latest scientific and technological achievements in such regions.

It is possible to deploy vision based sensing technology in underdeveloped areas or countries, which is easy to setup in rugged environment regions. Meanwhile, adequate information can be provided by vision sensors. Most of the video cameras used are restricted to video signal formats (e.g., NTSC 30~fps and PAL 25~fps) that are designed based on the characteristics of the human eye. However, there is a strong demand for high-speed and real-time structural health monitoring, especially in regions with unsafe and insecure conditions, such as building and social

infrastructure monitoring, where high-speed vibration cannot be seen by normal vision systems or the human eye. In recent years, we devoted scientific research to high speed vision sensing technology. We have successfully developed many actual high-speed and real-time tracking and recognition applications based on high speed vision sensing technology, such as a fast multi-object recognition system, a fast multi-color-object tracking system, and a simultaneous vision-based shape and motion analysis system for cells fast-flowing in a micro-channel. We have acquired a lot of experience in this field. To apply high-speed vision sensing technology in underdeveloped areas or countries to solve actual problems is meaningful and challenging work for us.

We intend to perform structural health monitoring by using multiple high-speed camera sensing systems and telescope lenses to evaluate danger levels of buildings and social infrastructure, such as bridges, in poorly-conditioned regions to establish safe and secure societies. Cultivating special talents in Ph.D. students is very important for undeveloped areas. The techniques, skills, and on-site reverse innovation abilities of Ph.D. students from different academic fields will be greatly improved in on-site practice.

## Hidegori Miyamoto (Special-Appointment Assistant Professor)

Affiliation: Graduate School of Engineering



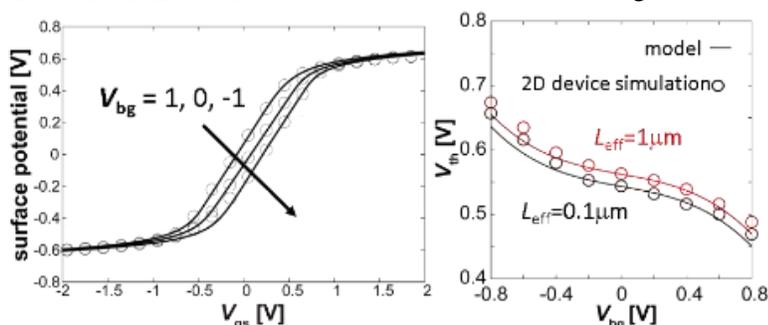
I was born in Tokushima, Japan, in 1983. I received a Ph. D. degree in science from Hiroshima University, Higashi-Hiroshima, Japan, in 2009. In July 2013 I joined HiSIM research center at Hiroshima University as a Researcher. Since December 2013 I have been a member of TAOYAKA Leading program at Hiroshima

University, where I am presently a Special Appointment Assistant Professor. My main present interest is in device simulation and modeling of MOSFETS.

We are investigating the threshold voltage of the ultra-thin Silicon on Insulator with ultra-thin Buried Oxide Metal Oxide Semiconductor Field Effect Transistor (SOTB-MOSFET). The focus is on the back-

gate voltage dependence as well as the structural variation. It has been shown that extracted threshold

voltage from measurements shows a linear dependence on the back gate voltage. An analytical threshold-voltage equation is derived based on the Poisson equation, considering all possible charges induced within the device. The derived equation includes the short channel effect as well as the SOI layer-thickness dependence. As verification of the developed equations, 2D-device simulation results are investigated.



## Social Implementation Course

### Makoto Chikaraishi

(Special-Appointment Associate Professor)

Affiliation:

Graduate School for International Development and Cooperation (IDEC)

I have been working in the Social Implementation Course of TAOYAKA Program from January 2014. My main research topic is to develop analytical tools for urban and transportation planning in both developed and developing countries. The main keywords are interactions, dynamics, and disparities. The

following are two examples that I would like to focus on.

The first is the case of developed countries, particularly in Japan. Japan and a number of western countries are now facing an aging and declining population. In these circumstances, the compact city has



become a leading concept in a number of developed cities under the premise that high population density, mixed land uses, and public transport with a high level of service could significantly reduce car use levels and enhance the quality and efficiency of urban management. On the other hand, promoting compactness inevitably involves the organized shrinkage of some neighborhoods. Since population is already distributed throughout regions, especially in many local cities, some individuals, especially elderly people who live in the shrinking neighborhoods, could suffer from the process, since investing more on such neighborhoods to increase accessibilities (e.g., building more facilities) could be inconsistent with the concept of compact city. Thus, from the viewpoint of social welfare for elderly, compact city policies should be carefully arranged. Ideally, a policy that maintains accessibility but doesn't attract more people to live in neighborhoods where some organized shrinking procedure will be undertaken may be preferable. Clearly, this requires well-organized accessibility planning. For example, we could hypothesize that improving accessibility between neighborhoods (urban-scale accessibility) may affect a person's preference of residential location, while improving accessibility within a neighborhood (neighborhood-scale accessibility) may be less influential. In this case, the latter policy could be more preferable than the former one. Changing accessibility could also influence land use patterns. For example, the level of accessibility will affect shopping destinations, resulting in the change of shopping facility distributions in the long run. And the changes in shopping facility

distributions, again, influence shopping destination choice behavior in the short run, and preferences on residential location in the long run. Such micro-macro interactions could be an important mechanism to describe and understand the process and consequences of a compact city, but the phenomena have not been well identified and modeled. My first research interest in TAOYAKA Program is thus to develop a tool to assess the impacts of compact city policies with the consideration of the above mentioned interactions.

My second interest is about paratransit issues in developing countries, particularly in India. Although the case is different, the underlying problem is basically the same as the first case, i.e., a number of phenomena are interacting with each other: Paratransit causes noise, air pollution, traffic accidents, congestion, and so on. For these reasons, one might want to regulate

paratransit systems. But on the other hand, paratransit has played an important role as a source of employment and a source of mobility, especially for the poor. Therefore, again, disadvantaged people could suffer from the regulation of paratransit systems, just like elderly people could potentially suffer from the compact city policies mentioned above. The timing may be one of the important aspects to alleviate the adverse effects of regulations, but such dynamics have not been well understood and modeled.

Both cases mentioned above indicate that some policies considered to be good for the society could result in increases in disparity. Such disparity issues have been little discussed, partly because of the lack of analytical tools to clarify and highlight the issues. Filling in this gap is my main task in TAOYAKA Program. I'm looking forward to discussing with all of you about any relevant research!



## Toshiaki Kondo (Special-Appointment Associate Professor)

Affiliation: Graduate School for International Development and Cooperation (IDEC)



Genetic Laboratory in IDEC, Hiroshima University

Dear colleagues,

It is a great pleasure for me to have an opportunity to introduce myself to you all. After obtaining a PhD degree in the Graduate School for International Development and Cooperation (IDEC), Hiroshima University, I enjoyed three years postdoc at the National Institute for Environmental Studies, Japan (NIES). While I worked at NIES, I joined a research project “Ecosystem Management in tropical regions” and conducted several research projects concerning the impact of logging on both the regeneration of tropical rainforests and ecosystem services, by using genetic analyses. In 2010, I came back IDEC as an assistant professor. Now, I’m working in the Social Implementation Course of TAOYAKA Program from January 2014 as an associate professor.

Ecosystem services are the benefits that people get from nature. Examples include fresh water, timber, climate regulation, medicine, recreation, and spiritual values. The food and fresh water that keep us alive, the wood that gives us shelter and furniture, even the climate and the air we breathe; all are products of the living systems of the planet. Furthermore, the various types of ecosystems build up and foster regionally specific cultures. Ongoing deforestation and degradation of ecosystems (e.g., deforestation, desertification), however, continues to be a serious global problem. The rate of deforestation has remained at 14 million ha annually since 1990, and most (78.6%) of this decrease has occurred in both developing countries and disadvantaged regions because of strong socio-economic dependency on natural resources and lenient management schemes or poorly designed land-use guidelines in these regions.

Such ecosystem disturbances brought about by human activities not only depress the quality of ecosystem services, but also fragment ecosystems and inhibit the regeneration of ecosystems by decreasing networking among ecosystem remnants (e.g., movement and gene flow of native species), thereby impairing the benefits that people get from nature in the future. Furthermore, such degradation of regional ecosystems would bring about the diminishment of regionally specific cultures. Given this situation,

introduction of ecosystem management to stimulate sustainable natural resource usage and ecosystem conservation in developing countries or disadvantaged regions is an emergency issue that must be addressed by both the international and the local community.

In this TAOYAKA Program, I’m looking forward to discussing, with students from different fields, ecosystem management strategies that balance sustainable natural resources usage and conservation of nature and culture!



Pasoh Forest Reserve in Malaysia. To observe the forest canopy layer, a canopy walkway was set up at a height of 30m.

## Takashi Okamoto (Researcher)

Affiliation: Graduate School for International Development and Cooperation (IDEC)



Greetings!

I'm Dr. Takashi Okamoto, your research administrator (URA) in TAOYAKA Program. My role in TAOYAKA Program is to support research activities such as setting up the environment so that students can carry out their research activities smoothly.

So, probably, I will not have a chance to converse with people and discuss or teach about my research in the program. But I was requested to explain my research to the public. Maybe nobody is interested, but let's start...

Although I had been working on coastal engineering since my Ph.D. studies, my current research interest

is on the ocean renewable energy, more precisely on wave power generation. Ocean renewables would be particularly useful as an alternative source for remote islands. Most remote islands are now generating electricity with diesel power generators. Since the fuel has to be delivered from the mainland, the fuel price, thus the price of electricity as well, is more expensive than the mainland and, more importantly, the fuel supply is not completely stable in the case of harsh climates. Ocean renewables have a potential to improve the energy security of those remote islands.

Wave power generation is said to be a promising technology due to the amount of energy we can access and its high density feature. However, it is still in the emerging stage and no commercial plant has been established yet. The first commercial plant will show up within a few years from now, but the next challenge will be cost reduction. Currently, the cost of electricity from wave power generation is much more expensive than conventional energy sources and even more than other renewable energies like PV or wind. From the experience of other renewables, it is

projected that the price of electricity will decrease as the technology matures and the market size increases.

However, to expand the market size, installation at lower energy sites has to be considered. Lower input energy results in low electricity output, which is equivalent with revenue being restricted, so it is more difficult to make the project profitable. Different from PV or wind, the energy capture done by wave energy converters cannot be estimated by the simple production of flux and area. It uses the nature of resonance. So, for each location with different wave conditions, there must be an optimal size of body to capture the wave energy effectively. However, maximizing the energy capture (or energy production) may not be the best way, because for those sites, the expected income is inherently restricted by the natural conditions. So, alternative design criteria would be needed to balance the energy production (income) and body size (expenditure).

I'm currently working on that kind of thing.

Chao.



### Sonoko Watanabe (Lecturer)

Affiliation: Graduate School for International Development and Cooperation (IDEC)

I do research in the fields of conservation biology and landscape ecology, focusing on agricultural ecosystems.

I grew up in Fukushima prefecture, Japan, and earned Bachelor's, Master's, and PhD degrees from Hiroshima University. I had initially planned to specialize in sociology but changed direction to major in landscape ecology after reading Rachel Carson's "Silent Spring" and some books about environmental crisis.

In 2003, I joined the Tokyo University of Information Science as Assistant Professor to teach classes in computer programming and geographic information systems (GIS) for landscape ecology. I participated in joint research into environmental corporate behavior with Chiba City Government and "Conservation of Red-data Plants in Chiba Prefecture" with the Natural History Museum and Institute, as a spatial statistics and GIS professional. I felt that contact with fields that were different from my own was very interesting and exciting.

In 2005, I was recruited to Hiroshima University to research ecological indicators of social capacity for environmental management and as staff at the Hiroshima International

Center for Environmental Management, which is an interdisciplinary team of social and natural science researchers who study, evaluate, and provide environmental assessments related to sustainable development in developing countries. In 2008, I began work for the global environmental leader's education program of Hiroshima University as Project Assistant Professor and was Project Manager for the education and student exchange programs. I am currently in charge of project management and on-site special lessons and am a project lecturer in the leading graduate program.

The Japanese traditional agricultural ecosystem, known as Satoyama, is one of my interests. Satoyama is the result of coexistence between humans and nature. My study sites are typically disadvantaged regions in Japan that are facing problems caused by depopulation coupled with an aging population. This situation has resulted in the abandonment of secondary forests and grassland and the ensuing underuse of bioresources. For the past few years, I have studied conservation ecological theory based on landscape ecology, spatial statistics, and geography. My major interest is the interactions in ecosystems, such as human activities and species/vegetation distribution patterns. I study this field from a

perspective of land use and species/vegetation patterns. My activities extend over a wide range of disciplines. I use vegetation surveys, GIS, and spatially explicit modeling to answer questions about meta-population mechanisms and habitat selection to gain a better understanding of how private-land management can advance conservation goals. I have explored the patterns, structure, and meaning of the Satoyama landscape, particularly natural and artificial ecosystem distribution, using spatial statistics and sociological approaches. My major works can be found in the Journal of Ecology, and my ecological research and minor works are reported on in some international conferences and domestic journals.

In the TAOYAKA graduate program, I am working on the sustainable use of bioresources and biodiversity conservation through an interdisciplinary approach by integrating various disciplines, including culture, technology, social implementation, and linkage effects. I am particularly interested in how ecological systems respond to human impact/stress and how policy, institutional design, and human behavior can be used to modify these responses, as well as how to incorporate uncertainty and resilience into ecological planning.

## Nepal, Bangladesh, and India



TAOYAKA Program Satellite Office in Nepal is located in Alternative Energy Promotion Centre (AEPC).

In TAOYAKA Program, students will do many educational and research activities in India, Bangladesh, and Nepal. To support these activities and promote TAOYAKA Program in those countries, the Program Office sets up a Satellite Office in each country. Their duties, in detail, are; building a database of basic information for each country, finding internship partners, coordinating the On-site Training Course, basic research on possible Team Project sites, arranging promotion events for those who are interested in TAOYAKA Program, etc. We set up the satellite offices in close relation with a well-established organization in each country. So, these satellite offices will work as the information and human network hub as well as the base camp of our activities in each country.

The Indian Office is now in negotiations with our counterpart and we are sure that we are going to make an announcement of establishment in the very near future. But the other two offices have already been established and have started their activities in their respective country.

The Bangladesh Office is situated in the Grameen Shakti, Dhaka; a group organization of the world famous Grameen Family. They are experts at improving people's lives in rural areas by installing innovative home systems like the off-grid PV home systems, smokeless cooking stove, Bio-gas system, etc. Our staff are; Mr. Absar Kamal as Senior Coordinator, Dr. M Shahidul Islam as Coordinator, and Mr. Mohammad Mahmodul Hasan as Assist. Coordinator/Executive.

The Nepal Office is situated in the Alternative Energy Promotion Centre (AEPC), Kathmandu. AEPC is a governmental agency of Nepal to promote renewable energy such as solar PV, micro-hydro, wind, bio-gas, and so on. Due to its geographical features, many villages in mountainous areas still have difficulty accessing enough electricity and clean water. AEPC has a lot of experience setting up projects in those remote areas. Our staff are; Mr. Ram Prasad Dhital as TAOYAKA Program Coordinator and Mr. Ranjit Gautam as Program Assistant. Former senior coordinator, Prof. Dr. Govind Raj Pokharel, Executive Director of AEPC, got promoted recently, so a new senior coordinator will be assigned very soon.



Inside TAOYAKA Program Satellite Office in Nepal – TAOYAKA Program members with local staffs

### Cultural Creation Course

**Nguyen Thi Phuong Hao** (Graduate School of Letters, Program in Humanities)

*From: Vietnam*



I graduated from Faculty of History in 2000, my major is World history, and my special areas concentrate on South and Southeast Asia countries. Before I came to Japan, I was vice manager of the Graduate and Post Graduate office, School of Social Sciences and Humanities, Vietnam National University, Ho Chi Minh city. I was also a researcher and teaching assistant for the professors who research South and Southeast Asia.

Since I was student, I have been very interested in the issues of cultural conflicts in the world. The first research I did when I was the junior student was “The cultural – ethnic conflict in Yugoslavia” (1998), and then “The cultural, ethnic conflict in Indonesia, the case of East Timor” (2000). After I graduated, I was working as a teaching assistant in my university and I continued studying there. In 2004, I wrote a report for an international conference in Cambodia with the name “Cultural

and ethnic conflicts in Southeast Asian - the challenge for the integration of the countries in the region”.

After 2004, with the help of my main advisor and the Indian Consulate in Ho Chi Minh City, I began to research India and the South Asian region. I have also done some research on cultural and ethnic conflicts as well as the challenges in integrating South Asia countries. In 2004, under the sponsorship of the United Board Foundation and Indian Consulate in Ho Chi Minh City, I went to India for 6 months to do my MA dissertation on India – Vietnam relations. Because of this time, I had a good opportunity to research India deeply. I continued to study South and Southeast Asian regions. At that time, I attended some conferences and short courses in Southeast Asian countries regarding the conflicts and integrated processes of South and Southeast Asia.

During this research time, I had a chance to read books by Fukazawa Yukichi named “An Encouragement of Learning” (Gakumon no Susume). Although the author did not mention cultural ethnic conflicts, the book was very important in influencing my thoughts. I paid strong attention to the education in developing

countries. I do believe that good and suitable education can effectively contribute to reducing the ethnic-cultural conflicts in the areas that I researched.

TAOYAKA is a very wonderful scholarship program for me. It gives me a chance to come to Fukuzawa Yukichi’s country home, where I can research him and his works deeply. It also grants me a good situation to keep studying in my special field (solutions for conflicts and stable peace for disadvantaged areas (including South Asian countries)). I have two wishes through this program: I would like to popularize widely the works of F. Yukichi after I finish my study in Japan and go back to Vietnam (I do believe that the ideology of the book is very helpful for young people and the education of Vietnamese people at this time), and secondly, I would like to complete my dissertation about India, a place I spend much of my time and effort.

I do hope that after finishing this program, I can get a big harvest of not only knowledge, but also new experiences that will be very helpful for my work in the future. And I believe that all of my fellow students will achieve their aims when they give their effort to TAOYAKA.

## Chau Ngoc Thai (Graduate School of Letters, Program in Humanities) From: Vietnam



I come from Vietnam. My hometown is Phan Thiet city, which is a small town serving as a bridge linking the Central and Southern parts of Vietnam, and it is well-known for its traditional goods, sea tourism and the agricultural product Dragon Fruit.

Before joining the TAOYAKA Program I started my teaching and research at the Department of Geography, University of Social Sciences and Humanities, Vietnam National University, Ho Chi Minh City (formerly Saigon) in 2003. I am interested in research and I have participated in a number of university granted and government funded research projects. Through those research projects, I have taken the opportunity to learn and improve my research skills and enlarge my practical knowledge.

Since working at one of the leading universities in Vietnam, my research interest has become focused on development policy in core regions of Vietnam. In addition, I am also involved in geopolitical issues in the context of regionalization and

globalization. Disadvantaged areas, both in developed countries and developing countries, always face the limitation of internal resources and a context where external resources are not easily mobilized for development. They tend to become unavoidably vulnerable and marginalized. In both developing and developed countries, the challenges are the threats of negative changes in population structure and young labors leaving disadvantaged areas for large cities to earn their living. As a result, the lack of human resources becomes the critical barrier to the development of disadvantaged regions, not only in developed but also in developing countries.

Therefore, regional innovation initiatives require a holistic approach, combining politico-economic, socio-cultural, environmental, and institutional factors. I have a strong desire to do my further studies in an interdisciplinary course with onsite studies in the TAOYAKA Program. Furthermore, I also expect to improve my people and leadership skills in taking leading roles in conducting bigger scale and highly influential research projects, and in advocating for the policy making process. Such knowledge and skills will be supplements to my background and can help me participate in complex and multi-expertise required issues in a real environment.

Through my experiences, I realize that regional development and integration requires not only state-

of-the-art science and technology, or economic and financial measures, but also involvement of indigenous cultural characteristics in a region or a nation as well. In fact, culture, in its broader sense, always plays a critical role in economic growth and sustainable development. Culture can be both motivation for, and constraint on, the improvement and development of a society.

In order to cope with these problems, we should think toward sustainable development and territorial balance and national security as possible solutions for the whole. We can enable environments for sustainable development of these areas, focusing on solving the problems by increasing density and reducing distance and decreasing division. Depending on what is the main issue of a particular area, we can give priority to the executable and appropriate solutions.

In the end, we all come from a variety of cultures with different backgrounds. Therefore, I would like to learn how to create dialogue and debate and cooperate, so that we can work more effectively together with different stakeholders in a project. The valuable experiences from Japan's economic miracle and unique culture, and various experiences from other countries in Asia, can provide many good practical lessons for my country. I strongly believe the knowledge and skills gained from international experience exchange in the TAOYAKA Program will increase mutual understanding and facilitate a cooperation network in policy

making for disadvantaged developing regions in Asian countries. The newly acquired knowledge and skills will be obtained not only through studying but also actively integrating with my fellow students' knowledge and skills through participating in onsite

research teams in the TAOYAKA Program. The path we will follow may be hard, as are the ways we will learn how to seek for and implement innovative, executive and appropriate ways to transform and revitalize disadvantaged regions, not only for developing but also in

developed countries. The path ahead is really rough but it is worth following. Let's go together to contribute to creating a globalized society of flexibility, endurance and peace.

**Anindita Maya Julungwangi** (Graduate School for International Development and Cooperation, Program in Educational Development and Cultural and Regional Studies)  
*From: Indonesia*



In 2007 - 2011, while doing my undergraduate study program of Communication Science under the Political Science Faculty in Gadjah Mada University, Yogyakarta, I joined a few activities inside and outside campus. I was a volunteer for Kolong Tangga Children's museum. Kolong Tangga Children's Museum is a center for conservation and promotion of traditional toys around the world. I also worked as a news anchor in Jogjakarta TV and Radio Broadcasting Service. Jogjakarta TV is a local television station with the mission to spread our local culture. In 2010, I got a golden opportunity to work as a marketing staff member in Affandi Museum in Yogyakarta City. The office gave me challenging tasks

to promote Affandi Museum as one of the prominent learning centers for painting arts following the great art of the late Mr. Affandi, one of the most popular artists in the country. In 2011, I get a bachelor's degree in Political Science from Gadjah Mada University. After that I was accepted as the marketing corporation relation officer in the distinguished State-Owned-Tourism Enterprise Office named *PT TAMAN WISATA CANDI BOROBUDUR, PRAMBANAN & RATU BOKO*. My main job was promoting Borobudur, Prambanan and Ratu Boko Temple to international societies, working together with domestic and foreign travel agencies and other related Indonesian government offices.

I am interested in tourism management, especially in the preservation of historical sites and community based tourism. I hope to grow as an internationally-minded person who has a wide range of knowledge, experience and skills for the development of society, being

active in promoting the mass-actions of local, regional and international communities to continue preserving their indigenous national identity (including culture, custom, and tradition), under a peaceful atmosphere. At the same time, I want to be involved in accepting and/or adapting high technology (especially eco-friendly tech) for the betterment of human life and security. TAOYAKA gives me a golden opportunity for gaining knowledge and experience through lecturers in the classroom and the on-site course rotation program. For example, I could have an opportunity to see directly what the main issues in rural areas in Japan are, as a developed country, and compare those to my country.

To all future students, TAOYAKA is a good program to explore and gain, not only knowledge, but also invaluable experiences. You will have a big opportunity to study on site and compare the main issues that happen in developed and developing countries. I believe it can help you a lot in the future!

## Technical Creation Course

**Yuki Nakamura** (Graduate School of Engineering, Program in System Cybernetics)

*From: Japan*



I have been studying electricity and doing research in the power electronics field at Hiroshima University. Especially, I have been developing a control method for

power conditioners which consists of a DC-DC converter and a DC-AC inverter for photovoltaic generation (PV).

PV utilizing solar energy can be used anywhere and the amount of solar energy is infinite. It is possible to minimize losses, and transmission costs, because we can install PV near the place which is using the power. So, in TAOYAKA Program, I would like to help solve the problem of electric power in disadvantaged regions by using a PV system. But PV's output power is profoundly affected by the climate of the region. Thus, power conditioners for PV should be designed for the region. Because I will stay in a

disadvantaged region in TAOYAKA Program, I think that I will be able to have a better understanding of the climate and problems in the region. For example, I have already visited Tani in Shimane, during Japan by One-day Onsite Visit. Tani is a mountainous region. I was able to actually see the living conditions of people in Tani. It was a valuable experience for me.

I hadn't held discussions with students who study other areas of research until I entered TAOYAKA Program. Then, I could realize that opinions which other groups have can give me new perspectives. So I want to continue having a fruitful discussion in this program!

**Hiroshi Zenitani** (Graduate School of Advanced Sciences of Matter, Program in Semiconductor Electronics and Integration Science)

*From: Japan*

I graduated from the Engineering program at Hiroshima University in 2014. My major is semiconductor integrated science. I studied semiconductor properties, for example physical or electrical characteristics. Now I'm a member of the Laboratory for ultra-small device engineering in the Hiroshima graduate school of Advanced Sciences of Matter. I'm engaging in device simulation and modeling, for example Diodes and MOSFETs.

What I'm focusing on is renewable power, especially solar power. Electric power systems have some problems, including nuclear plant security and a dependence on fossil fuels. I am thinking that we engineers must consider renewable power more and more.

I would like to proceed to disadvantaged areas of developing countries and really understand what is the locally required technologies are. And what I would not like to forget is having a flexible view



within different cultures and during international communication, and grasping the varying situations and problems. Though it has been only a little time since the beginning of the program, we have already had some experiences, like onsite visits and

discussions with other groups. In fact, I have hardly ever had the opportunity of discussion and debate, so I feel these are very meaningful and fresh experiences.

It is embarrassing that I'm not very good at English, so sometimes I cannot understand what other students are saying, but then, they will kindly try to support me. It is very helpful for me and I would like to support them in the reverse case.

In the future, we may face some troubles or conflicts, but I believe we can surely solve them peacefully because we are TAOYAKA students!

## Zhang Xiangyu (Graduate School of Advanced Sciences of Matter, Program in Semiconductor Electronics and Integration Science)

*From: China*

I graduated from Tianjin University in July 2013. My major was Electronic Science and Technology. After graduation, I went to Shenzhen. I was an assistant engineer in Peking University Shenzhen SOC key laboratory. My work was about the MOSFET (Metal-Oxide-Semiconductor Field-Effect-Transistor) device model development. I developed a model for a cylindrical surrounding gate MOSFET. The MOSFET has an insulated core. This time, I only focused on current-voltage characteristics. The model is based on potential theory and is a compact model.

My field of interest focuses on VLSI (Very Large Scale Integrated) circuit architecture design for intelligent applications in disadvantaged areas, including intelligent recognition systems, solar systems, intelligent emergency warning systems, and so on. Since these systems will mainly be used in disadvantaged regions, these systems should realize low power consumption, automatic failure detection, lifetime extension of aging components, and should be grid independent. Therefore, I will

also do research on solar energy to reduce power consumption, and battery-management systems to improve the storage lifetime and reliability of batteries.

Through TAOYAKA Program, I expect to be an innovation leader aiming for the creation of a multicultural coexistence society. I would like to have a broad perspective, autonomous execution, multi-faceted thinking, and creativity to promote the formation of symbiotic regional societies, and the ability to create science and technology that can be applied to problems concerning the cultural and social environments of disadvantaged regions. I wish that I could recognize issues related to cohabitation and coexistence of diverse people and regions, have the communication skills to be able to interact with a diversity of people, be able to identify cultural characteristics or social issues of disadvantaged regions, have cross-disciplinary knowledge and wide-ranging specialist knowledge, and propose and implement technological development in response to the needs of regional societies. In addition, I hope that I



could take the lead in the mutual creation of regional culture by understanding Japanese culture and helping the Japanese students to understand Chinese culture.

Although I have been a student of TAOYAKA Program for only two months, I could experience cooperation and communication with students from different disciplines, and stable support from TAOYAKA Program. I have an onsite course rotation lecture which is aimed at promoting awareness of onsite issues. In a one-day onsite visit, we went to Shimane Mountainous Region, and investigated the local issues, demands and culture. After coming back, through discussing and exchanging ideas with other groups' students, we found a possible solution to the local problems. Also, TAOYAKA students are from different backgrounds and culture.

Therefore, I could learn about various cultures through communicating with each of them. Moreover, I have lectures from various graduate schools, including advanced sciences of matter, engineering, and international development and cooperation. I enjoy these colorful lectures.

TAOYAKA Program provides a perfect platform for us to become an innovation leader in the creation of a convivial society. In the past two months, our TAOYAKA students have made some progress. However, I think we could do better if we have more specialized knowledge, and the ability to analyze an issue from various directions at the same time,

including a technical direction, cultural direction and social implementation direction. Therefore, we should try to improve ourselves in these aspects in the future.

## Social Implementation Course

**Mohammad Jahangir Alam** (Graduate School for International Development and Cooperation, Program in Development Science)

*From: Bangladesh*

Before I joined the TAOYAKA Program I was involved with teaching in the Department of Economics at Jahangirnagar University, Dhaka, Bangladesh. I had been actively involved in studying and researching on different aspects of socioeconomics, especially in the field of Resource and Development Economics. I worked as a part-time faculty member in the Institute of Cost and Management Accountants of Bangladesh (ICMAB), a leading professional body in Bangladesh that offers professional degrees in Cost and Management Accountancy, with a focus on accounting for business. I also worked as a research officer in Metropolitan Chamber of Commerce and Industry (MCCI) — the oldest representative trade organization of Bangladesh — where I had an excellent opportunity to use my theoretical knowledge at a practical level. The responsibilities included there were to provide research support to senior researchers in the

field of macroeconomics and international trade and occasionally to organize seminars and conferences. I conducted research at policy levels and provided useful policy advice to the Bangladesh Bank and the Ministry of Finance, including the National Board of Revenue (NBR).

I have gained extensive knowledge in the field of economics which can help me to choose a future field of interest. I hope to develop expertise in sustainable development, especially ensuring energy security in remote areas for both developing and developed countries. I will also try to find the interdisciplinary relationship between economics, culture, environment and technology.

The program design involved forming a team and the team's project analysis and research about the technological impact and benefit accrued by the disadvantaged regions in developing nations and advanced nations. The team is

supposed to investigate some disadvantaged regions in developed countries where depopulation and ageing population is progressing and a number of disadvantaged regions in developing countries where significant prevalence of poverty and wealth disparity exists. Towards the completion of this program, I would be able to find innovative ideas and techniques to solve the problems of disadvantaged regions of both developed and developing countries. The program will equip us with the autonomy, ability to execute, multilateral thinking and creativity required as global leaders which can cover a wide range of activities. Despite the short time duration, I think that the program will go on the right track and also produce skilled and knowledgeable individuals who contribute a lot for building TAOYAKA society which is the ultimate dream of the program.

I am optimistic that the TAOYAKA Program, which is based on the three



important features of Flexibility, Endurance and Peacefulness, will be useful in finding and resolving the problems that disadvantaged regions

confront. The program design consists of cross-disciplinary, multicultural coexistence and technology that enables us to better

identify and understand the problems in disadvantaged regions and adopt solutions based on sustainability.

## REPORT: Education Program – Onsite Course Rotation

### One-day Onsite Visit on May 14, 2014

Hodohara Area

Contributed by **Makoto Chikaraishi**  
(Special-Appointment Associate Professor, IDEC)

#### 1. Summary of onsite visit

On May 14, 2014, we, 7 TAOYAKA staff, 2 teaching assistants, and 7 students from TAOYAKA Program, visited Iinan-cho located in Shimane prefecture. This visit was done as a part of Onsite Course Rotation, which is one of the core subjects of TAOYAKA Program. The schedule of the visit was as follows:



- 10:30-11:30 Onsite visit 1: Tani Syougakkou (Tani smiling/laughing school) and Fish (Yamame, a kind of trout) farm
- 11:00-13:30 Onsite visit 2: Hodohara
- 14:00-16:00 Onsite visit 3: Shimane Mountainous Region Research Center

The primary motivation of the visit was to understand the issues that mountainous areas currently face and how they manage them. Mountainous areas account for 73% of Japans' total land area, while only 11% of total population lives in these regions. The first site, Tani district, is one of the most successful examples of how to revitalize and maintain the community, even when the population has decreased over the

decades. The second site, Hodohara area, operates a so-called community bus which is a kind of volunteer-based public transport system run by the community members. Finally, we visited the Shimane Mountainous Region Research Center, founded in 1998, which is the first and only institute for studying comprehensive and interdisciplinary research on mountainous regions in Japan. We learned about the current research activities at the center.

(population aging rate in the district reaches 47%), Tani elementary school was closed in 2005, and the abolished school was renovated to be a community center in 2010. We learned the history of the Tani elementary school and the current activities in the community center. Although the population of Tani district is just around 250 (around 90 households), the number of visitors reaches around 5,000 per year. After visiting Tani Syougakkou, we stopped by a fish (Yamame) farm in Tani district, which is one of the most important attractions in Tani district.

Here is a brief summary of each visit.

#### Onsite visit 1: Tani Syougakkou and Fish (Yamame) farm

We first visited Tani Syougakkou, which is a kind of community center in the Tani district. Due to population decline and aging in this district

#### Onsite visit 2: Hodohara area in Tani district

We then visited Hodohara area in Tani district. Amazingly, only 8



Tani Syougakkou

households (12 individuals) live in this area and population aging rate reaches 90%. One of the main problems in this area is transportation. Since there are no shopping or hospital facilities in Hodohara, they have to go to Akana district, 12 km to the east. The nearest taxi company is also located far away from Hodohara (17 km), and thus Hodohara is an unprofitable area for the company. Because of these reasons, they decided to introduce a kind of volunteer-based public transport system run by the community members, which has become one of the most successful examples of community bus service.



Before moving to the next site, we had a special lunch in Hodohara. Most ingredients are made in Tani district, including Yamame (fish), rice, and many mountain vegetables.

### **Onsite visit 3: Shimane Mountainous Region Research Center**

Finally, we visited the Shimane Mountainous Region Research Center and listened to a very impressive lecture by Dr. Ko Fujiyama. The lecture was entitled

“Mountainous Region: Crisis, Hope, and Solution”. He first introduced the current situation of mountainous areas in Japan and connected it with the things happening in developing countries. He then introduced several vigorous mountain villages in eastern countries. Finally, he showed one of the possible ways to make the mountainous areas sustainable in the long run: building community stations in the village to link people, objects, energy and information together. This message reminded me of Jane Jacobs’ “improvisation”. Vitality of neighborhoods and local

citizenship may play a crucial role in the management of mountainous areas.

### **2. Student presentations and discussions after onsite visit**

After coming back from the site, TAOYAKA students had discussions and presentations mainly focusing on “Technology-culture conflict in sparsely populated regions: A case of virtual accessibility”. The following is a note given to students before the visit.

After visiting the site, you will feel how mountainous regions are sparsely populated and transportation plays a significant role in their daily life. In such situation, telecommunication services (such as telephone and the Internet) are important tools for those who have transport difficulties [Technology]. In this sense, transportation (physical accessibility) can be substituted for with these technologies (virtual accessibility) to some extent. On the other hand, such technology-driven solutions could sometimes cause adverse effects. For example, some researchers emphasize going to a supermarket is not just for shopping, but also for meeting and talking with other community members, resulting in maintaining their social networks (and culture that the community holds in the long run) [Culture]. Similar technology-culture conflicts can easily be found in the real world, such as the use of telemedical service. Thus, technology-based services need to be designed with a deep understanding of the linkages between technologies and culture [Social Implementation].



In the discussions, the social implementation group first presented an overall summary of the visit and the basic framework for the discussions, including diversity of value systems (even within a community), policy options, possible production functions to be maximized, and the utilization of the

ideas learnt in Tani to the disadvantaged areas in developing countries. The technology student group focused on the applicability of a “Smart Community System”, generating energy for their own use for electric vehicle sharing, for example. The culture group, on the other hand, emphasized the importance of giving more priorities to eco-tourism, for example by changing abandoned houses to guest houses to attract more people to Tani. Although the discussions are diversified and it’s difficult to give a single conclusion (just as in many other interdisciplinary studies), the visit and discussions seem to be quite useful to understand not only the current situation in mountainous areas in Japan, but also how different

academic backgrounds generate different ideas. Harmonizing these differences are quite challenging but it seems to be necessary to give a better collective decision, particularly in disadvantaged areas.

### Acknowledgment

This visit was planned and implemented under a collaboration with the Shimane Mountainous Region Research Center. We would like to express our appreciation for the effort and support, especially from Dr. Ko Fujiyama, and Ms. Yoshimi Kishimoto. We would also like to thank local people in Tani for their warm welcome and for providing us with useful information.

## REPORT: Research

### A Pilot Survey of Rural Villages in Nepal

Contributed by **Shinji Kaneko**  
(Professor, IDEC)

A group of eight professors and researchers from IDEC, Hiroshima University and Kobe University conducted a pilot survey in villages in rural Nepal from May 1 to May 7, 2014 in collaboration with approximately fifteen local experts



of the Alternative Energy Promotion Center, a government agency of Nepal under the Ministry of Science, Technology, and Environment, as joint activities under the TAOYAKA Program and MEXT Grant-in-Aid for Scientific Research A (25257102).

Prior to the research, the team developed a list of villages in which the people had no access to the electricity grid and water supply system. It counted 1,130 villages of that kind out of 36,000 rural villages in Nepal. Villages visited in this pilot survey were selected from this list. The AEPC has been promoting



solar water pumping systems (SWPS) through subsidy programs for those villages where villagers spend huge time and effort to carry drinking water every day from far away from the home along very steep and



impacts of water carrying burdens on the bone mass among ladies who are mainly engaged in the water carrying.

The team stayed in a mountain lodge and enjoyed the natural surroundings, but also experienced a severe lifestyle without electricity or a sufficient supply of drinkable water.

One of the villages that the team visited was situated in a hilly range (by Nepali standards!) about 60km away from Kathmandu on a straight line, but it required 12 hours even by bus to reach the nearest village, due to having to make some accommodations and detours like routing, winding roads, and the road conditions. Narrow, uneven pavement on the what-they-called “highway” made the bus ride always shaky and bumpy, and team members were exhausted even before reaching the base camp. The unpaved road to the villages was another big challenge for the team.

Team members were scared several times when they saw the bottom of a deep valley through the window of the inclined bus, which made them think of the danger of falling off. The road to the village was just recently expanded to have enough width for vehicle transportation: only three years ago! Until then, two representatives of the villagers had to carry the packs of salt of 40 kg each on foot from the nearest market, which forced them to make two weeks of round trips through very difficult mountain trails.

With further modifications and revisions made by the lessons learnt from the pilot survey, the team will move on to the first main survey for sixty villages throughout the country in the coming autumn, after the rainy season. The main survey will be repeated every year from now, for five years, to construct the long term household panel database. In addition, the team will conduct a couple of interventions in selected villages among the sixty villages.

narrow trails. The research aims to understand the following three questions: i) what types of impacts are brought to the income and the livelihoods, including health, education and cultural values, of villagers after the installation of the SWPS; ii) how the consensus and agreements are developed among the villagers for installing and managing the SWPS as a joint good; iii) what types of interventions can possibly accelerate the promotion of SWPS and leverage the positive impacts and minimize the adverse impacts. The pilot survey was carried out to test and confirm the survey form and to train the field investigators in preparation for an extended household panel survey over the next five years as a part of the randomized controlled trial (RCT). The household panel data will be also used for educational purposes as well as the research activities in the TAOYAKA Program.

One of the challenges of this pilot survey is to test the functionality of health meters in the field, which are kindly donated by the TANITA Corporation. The health meter can measure not only body mass and body water composition but also bone mass. We try to quantify the



## REPORT: TAOYAKA Program Seminars



The 1<sup>st</sup> TAOYAKA Program Seminar "Challenges in Life in Rural India: Efforts toward Microgrid Deployment"  
– December 20<sup>th</sup>, 2013

TAOYAKA Program frequently holds TAOYAKA Program Seminars with lecturers/speakers invited from universities within Japan and overseas, collaborative organizations and enterprises, etc. The seminars provide opportunities to exchange information on multicultural-coexistence and to develop educational materials. Many of TAOYAKA Program Seminars are open to the public.

Please see TAOYAKA Program's website for information on upcoming TAOYAKA Program Seminars (<http://taoyaka.hiroshima-u.ac.jp/english>).

### *TAOYAKA Program Seminar Pickup Reports*

#### **The 4<sup>th</sup> TAOYAKA Program Seminar (January 25<sup>th</sup>, 2014)**

#### **“The Center for Contemporary India Studies at Hiroshima University (HINDAS) the 5<sup>th</sup> Regular Meeting”**

This seminar was co-hosted by TAOYAKA Program and the Center for Contemporary India Studies at Hiroshima University (HINDAS). 4

speakers gave presentations on their researches:

“Changes of markets in Sandila Region, Uttar Pradesh, India” by

Prof. Tsunetoshi Mizoguchi (Nagoya University)

“Geographic Distribution and Development of Retail Chain in

India” by Prof. Jun Tsuchiya (Miyagi Gakuin Women’s University)

“Markets in Nepal – in comparison with India and Bangladesh” by Dr. Kazuyuki Watanabe (Ritsumeikan University)

“An Observation on the Compulsory Education System in contemporary India” by Dr. Yukari Sugiura (Aichi Shutoku University)

HINDAS promotes area studies in contemporary India and has the connection of a research network

with six other institutions in Japan. TAOYAKA Program focuses on South Asian including India as its field of onsite studies; thus, the seminar was an opportunity to strengthen the relationship between HINDAS and TAOYAKA Program in conducting fieldworks and researches.

## The 12<sup>th</sup> TAOYAKA Program Seminar (March 13<sup>th</sup>, 2014) “Cultural diversity in urban and transportation planning”

3 speakers gave presentations on their researches:

“Linking unplanned urbanization, disparity and accessibility in the context of Indian mega cities” by Dr. Arnab Jana (Assistant Professor, Centre for Urban Science and Engineering, Indian Institutes of Technology (IIT) Bombay)

“Urban Transportation Issues in Turkey: A Retrospective and Prospective Outlook” by Dr. Metin Senbil (Associate Professor, Department of City and Regional Planning, Faculty of Architecture, Gazi University)

“Low-carbon transport policies under the cultural diversity in Southeast Asian cities” by Dr. Sudarmanto Budi Nugroho (Policy

Researcher, Sustainable Cities, Integrated Policies for Sustainable Society (IPSS), Institute for Global Environmental Strategies (IGES))

The aim of this seminar was to deepen TAOYAKA Program members’ understanding on how culture influenced urban and transportation planning in cities having cultural diversities. Dr. Arnab Jana gave a presentation on urbanization, disparity, and accessibility issues in India. Dr. Metin Senbil’s presentation focused on systematic problems on urban transportation in Turkey. Dr. Sudarmanto Budi Nugroho gave a presentation on low-carbon transport policies in South Asian cities.

The three speakers introduced issues and current circumstances in regions where their researches focused on, and the speakers raised questions on several issues in the regions. The issues discussed in the seminar included “short-term emergency countermeasures having been implemented without sufficient,

clear relation with other phenomena,” and “problems on the vested right, decision-making entity, and relationship among them.”

The discussion confirmed the importance of developing policies after examining the situation of a respective country or city in detail. The issues among these areas could be considered as the same “phenomena”; however, solutions for the issues would highly depend on the circumstance factors including culture and thus would vary in each area.

Dr. Sudarmanto Budi Nugroho giving a presentation at the 12<sup>th</sup> TAOYAKA Program Seminar – March 13<sup>th</sup>, 2014



Prof. Akimasa Fujiwara giving a certificate to Dr. Sudarmanto Budi Nugroho at the 12<sup>th</sup> TAOYAKA Program Seminar – March 13<sup>th</sup>, 2014

## The 13<sup>th</sup> TAOYAKA Program Seminar (March 18<sup>th</sup>, 2014)

“RF and Microwave Engineering”

**Speaker: Prof. Shibani K Koul (Professor and Deputy Director, Indian Institute of Technology Delhi)**

The purpose of this seminar was to audit the lecture of Prof. Shibani K Koul and discuss the education and research of Indian Institute of Technology Delhi (IITD) for a future reference of TAOYAKA Program. Firstly, Prof. Koul introduced IITD’s educational program. The program seemed very successful, as proven by

the degree of students’ satisfaction. Prof. Koul also presented the facilities in the IIT-D which were well-financed and equipped for high-performance. In the end, Prof. Koul introduced his books on circuits. The books have been read around the world, especially in the United States. An active discussion between Prof. Koul and participants took place.



Prof. Shibani K Koul giving a presentation at the 13<sup>th</sup> TAOYAKA Program Seminar – March 18<sup>th</sup>, 2014

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## Upcoming Schedule

- **July 4<sup>th</sup> Onsite Course Rotation “Onsite Visit” to Hiroshima Peace Memorial Park (a class of TAOYAKA Program)**
- **July 31<sup>st</sup> TAOYAKA Program Seminar**  
Title: TBD  
Venue: Lecture Room 210, Graduate School of Engineering, Hiroshima University  
Time: 14:35pm-16:05pm
- **September 8<sup>th</sup> – 11<sup>th</sup> Collaborative Fieldwork with Doshisha University and Kyushu University in Oita and Fukuoka Prefectures**

## ***Flexibility, Endurability, and Peace***

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TAOYAKA Program for creating a flexible, enduring, peaceful society  
Organization of the Leading Graduate Education Program

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