Tackling Global Challenges - “Science and Technology Research Partnership for Sustainable Development (SATREPS)”

Hideki MIZUMA
Japan Science and Technology Agency

Partnerships for Enhanced Engagement in Research (PEER) Science Participants’ Conference 2013,
4 October, 2013
Bangkok, Thailand
Background

➢ The issues of global concern (climate change, infectious disease, biodiversity degradation, food/water shortage, natural disaster) are becoming imminent threat for humankind and solution by science and technology is craved for.

➢ Traditional technology transfer used in ODA may not be adequate for addressing these global issues: technical and social innovation through new knowledge and technologies requires high commitment of researchers.

➢ Most of critical events and phenomena occur in the Developing Countries, hence their collaboration is crucially essential.

➢ S&T capacity development in DC with an win-win research arrangement is the steadfast approach towards the solution of these challenges.
Creation of SATREPS

SATREPS = Created by the strong policy directive from the Council for the Science and Technology Policy (CSTP) chaired by the Prime Minister

“To link S&T with foreign policy for mutual development”

Utilize S&T for diplomatic purposes

Utilize diplomacy for the further development of S&T

“Strengthening S&T cooperation with developing countries for resolving the global issues” “in the areas of the environment and energy, disaster prevention … and infectious diseases”

From Council for Science and Technology Policy (CSTP)’s “Toward the Reinforcement of S&T Diplomacy” (May 19, 2008)
Japan Science and Technology Agency (JST) ex-President, Koichi KITAZAWA, and Japan International Cooperation Agency (JICA) ex-President Sadako OGATA officially signed the Memorandum of Understanding to implement the “Science and Technology Research Partnership for Sustainable Development (SATREPS)” program.

JST: Science Funding Agency for the government of Japan

JICA: ODA Agency for the government of Japan
SATREPS aims

Enhancing cooperation in science & technology
〜 Building win-win relationships between Japan and developing countries〜

New technology, new knowledge
〜 Addressing global issues and advancing science〜

Capacity Development
〜 Boosting self-reliant R&D capacity and sustainable research systems, training human resources and coordinating networking between researchers〜

Practical utilization
〜 Expecting outcomes to make a real contribution to society〜
Science & Technology × Official Development Assistance

SATREPS joins and coordinates functions, activities, and capabilities that were once separate, using scientific research potential as a mediator for developmental diplomacy.

Science and Technology
Promoting science and technology, encouraging innovation

Meeting Global Needs
Resolving global issues and contributing to the science and technology community

Japan’s Capabilities
- World-leading technology, proven research capacity
- Soft power

International Cooperation
ODA, development assistance

Meeting Local Needs
Capacity development to address issues emerging as local needs in developing countries

Developing Countries’ Capabilities
- Direct experience, knowledge, and data needed for research on global issues
- Potential to contribute to the global economy through new markets and industries
SATREPS program structure

MEXT/ JST

R&D Support

Research Institutions in Japan

International Joint Research

Research Institutions in Developing Countries

MOFA/ JICA

Technical Cooperation

ODA

Collaboration

Research Partnership

Research Funding

Approx. 100 million JPY / project / year (JST + JICA total)

Research Period

3-5 years
Research Areas

5 areas

■ Environment and Energy
  • Global-scale Environmental Issues
    Climate change mitigation & adaptation, Safe water supply, Biodiversity conservation..
  • Low-carbon Society
    Biomass energy, Energy efficiency, Renewable energy..

■ Bio resource Utilization
  Breeding and cultivation technology, Bio resource management..

■ Natural Disaster Prevention
  Natural disaster mechanisms (Earthquakes, Volcanic..), Natural disaster mitigation..

■ Infectious Diseases Control
  Diagnostic tool, Vaccines, Therapeutic products development (Avian influenza, HIV/AIDS, Dengue fever..)
OECD Report
Report on Opportunities, Challenges and Good Practices in International Research Cooperation between Developed and Developing Countries


◇ issued by OECD Global Science Forum in May 2011

◇ based on workshop in Pretoria (September 2010) with STRONG African presence
- 19 government officials, 8 researchers; keynote speech by Executive Director of TWAS

◇ Dr. Mohamed Hassan (Former TWAS Director), Dr. Crispus Kiamba (Min. of High. Edu., Kenya), etc.

describes issues and options that deserve the attention of scientists and administrators in industrialized countries and in developing countries, as they seek to design, initiate and manage collaborative research programs and projects that include both scientific and development goals.
**SATREPS projects (FY2008-FY2013)**

78 projects commenced in 39 countries!

Half of the projects in Asia, 1/4 in Africa

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<td>Environment/Energy (Low Carbon Society/Energy)</td>
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JST calls for research proposals for FY2014 from Japanese research institutions from September 10th, 2013 (Tues) to October 25th, 2013 (Fri) at 12:00 hour (noon) in Japan.

Based on the needs of developing countries, JST and JICA cooperate to promote international joint research targeting global issues\(^1\) with an objective of future utilization of research outcomes\(^2\). Implemented through collaboration with Official development Assistance (ODA), the aim of the program is to acquire new knowledge and technology, and to apply the knowledge and technology acquired to create innovations, leading to the resolution of global issues and the advance of science and technology. International joint research under this program also aims to enhance the research and development capabilities of developing countries, and helps create sustainable research systems able to address and resolve issues.

\[1\] Global issues: Issues that are difficult to resolve by a single country or region acting on its own and that need to be handled by the international community as a whole

\[2\] Utilization of research outcomes: The research projects should lead to future social and economic benefits, achieved by using newly obtained knowledge and technology to enhance government services or to develop products that can be deployed in the market.

<table>
<thead>
<tr>
<th>Research fields (number of research areas)</th>
<th>Cooperation request from recipient country</th>
<th>Research period</th>
<th>Research budget from JST</th>
</tr>
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<tr>
<td>Environment and Energy (2 research areas)</td>
<td>Compulsory</td>
<td>3 to 5 years</td>
<td>Approx. ¥36M/year (including indirect costs) (Approx. ¥180 M in total for a 5-year project)</td>
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<tr>
<td>Bioresources (1 research area)</td>
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<td>Natural Disaster Prevention (1 research area)</td>
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<td>Infectious Diseases Control (1 research area)</td>
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Note1: From FY2014 onwards, “interdisciplinary” proposals (proposals where multiple fields are selected on the research proposal form) are no longer accepted. When submitting a research proposal for a project involving interdisciplinary research that merges or extends over multiple fields or areas, select the area that is the closest match.

Note2: The number of proposals to be selected and the research budget from JST are tentative, and may change due to budgetary considerations.
## FY2014 SATREPS

### Invitation for Application of Research Proposals (2)

#### Schedule for application and selection

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<tr>
<td><strong>Applications start date</strong></td>
<td><strong>Tuesday September 10, 2013</strong></td>
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<tr>
<td><strong>Applications deadline</strong></td>
<td><strong>12:00 noon (Japan time) on Friday October 25, 2013</strong> (applications received after the deadline will not be accepted)</td>
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<td><strong>(Deadline for ODA applications to reach MOFA is the same)</strong></td>
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<td><strong>Document screening</strong></td>
<td><strong>Early November 2013 to late February 2014</strong></td>
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<tr>
<td><strong>Notification of document screening results</strong></td>
<td><strong>Late February 2014</strong></td>
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<tr>
<td><strong>Interviewing for selection</strong></td>
<td><strong>Late February 2014 to mid March 2014</strong></td>
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<tr>
<td><strong>Conditional approval and notification</strong></td>
<td><strong>Late March 2014</strong></td>
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<tr>
<td><strong>Start of research</strong></td>
<td><strong>April 2014 or later, following signing of the R/D</strong></td>
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*1 MOFA must receive an application for ODA from the government of the recipient country by the deadline. This is one of the conditions for selection.

*2 Around the same time as the selection of research projects in Japan, notification regarding selections for the corresponding ODA technical cooperation will be made to governments of recipient countries. Subsequently, when the R/D is signed between JICA and the counterpart, the research project will be formally approved for awarding, and international joint research will begin. Selection of the research project in Japan will be announced to the public at an appropriate time after notifying the PI of conditional approval.
In the tropical Thailand, the Dengue virus infects 50 million people annually, and a quarter million people are seriously affected. Our project aims for developing new therapeutic drugs, and has successfully created antibodies against the virus. In Sept. 2012, the international application under the Patent Cooperation Treaty has been filed. Drug development in collaboration with major pharmaceutical companies is now under consideration.

“Research and Development of Therapeutic Products against Infectious Diseases, especially Dengue Virus Infection” (Adopted in FY2008/Thailand)

The Carbon Capture and Storage (CCS), which might become the first plant in Southeast Asia if successful, is currently under development. The inquiries from the foreign governments have been increasingly received. This project aims to capture the CO2 emitted from the Gundih gas field and sequester it underground.

“Pilot study for carbon sequestration and monitoring in Gundih area - East Java Province, Indonesia” (Adopted in FY2011/Indonesia)

Manufacturing technology for High Bio-Diesel (HiBD) derived from Non-food biomass is under development. In July 2012, our research institutions concluded an agreement with an automobile manufacturer (Isuzu Motors Co. (Thailand) Ltd.) to begin driving tests (50,000kms in 2 months) using practical vehicles in Thailand.

“Innovation on Production and Automotive Utilization of Biofuels from Non-food Biomass” (Adopted in FY2009/Thailand)
Human Resource Development through MEXT Scholarship Program

✓ Human resource development through the Japanese Government (MEXT) Scholarship Program. From FY 2010, MEXT established a “Global-Issue Section” within Japanese government scholarship program (University Recommendation) for SATREPS projects.

✓ The aim of the Global-Issue Section is to develop young researchers with the potential to be future key players in relevant research in their own countries by taking a doctorate at Japanese institutions.

✓ Invitation for this Japanese government scholarship program is implemented by MEXT, and scholarship is budgeted separately from SATREPS. To be eligible for this program, a doctoral degree needs to be received within the term of the SATREPS project.

Japanese Government (MEXT/Monbukagakusho) Scholarship Program website

http://www.mext.go.jp/a_menu/koutou/ryugaku/06032818.htm (Japanese)
http://www.studyjapan.go.jp/en/toj/toj0302e.html (English)

*Please note that the availability of this scholarship program can be altered depending on the final budget.
Thank you for your attention!
Reference
Online Community (SNS): Friends of SATREPS

Launched June 1, 2011

Interested in global issues? Join Friends of SATREPS! Membership is free, and anyone can take part, communicate with other project participants, researchers, students, people from the private sector, NGOs, etc. Join the conversation. Join the SATREPS community.

- Registered members: Over 4,300!
- Countries involved: Approx. 95
- Number of communities: Approx. 300

Community Categories
- Nature/Environment
- Energy
- Bioresources
- Natural Disaster Prevention
- Life/Health
- Developing Country Assistance
- Others

Membership ranking by country

1. Japan
2. Indonesia
3. Thailand
4. Malaysia
5. Vietnam
6. Philippines
7. Ghana
8. Algeria
9. South Africa
10. Brazil
11. USA
12. Srilanca
13. Egypt
14. Turky
15. Afghanistan
16. Mexico
17. Bangladesh

(As of August 15, 2012)
**Friends of SATREPS (FOS) services**

Through Friends of SATREPS, you can:

- **Receive news and information about related events**
  Receive news about the SATREPS program, current projects, and information about related events.

- **Cooperate with current projects**
  Take part in SATREPS community by finding ways to cooperate with one of the current projects. Ideal for students with an interest in the environment or for companies/NGOs involved in related initiatives.

- **Work on preparations for new projects**
  Put together a project team for a new SATREPS project proposal, find teammates, and brainstorm on proposal details.

- **Share information and ideas**
  Share ideas and information with community members on topics such as environment and energy issues, bioresources, control of infectious diseases, and natural disaster prevention.

◊ **FOS is created as a platform for communication** among like minded people.

◊ **Members are a rich source of information** about life and culture in the field. **Discoveries and encounters** are not limited to research topics.

◊ **Stay up to date on developing country news.** **Communication channels** between researchers, companies, and other entities outlast research projects.
Friends of SATREPS communities

- Sea level rise in small island countries (10)
- Maritime Continent studies (20)
- Indian's DHS (14)
- Water and sanitation system in Sahel, Africa (27)
- Renewable energy projects (1)
- Development of CCS in Indonesia (4)
- Earthquake and tsunami mitigation in Peru (16)
- Climate variations in South Africa (38)
- Natural rubber for carbon cycle projects (10)
Friends of SATREPS  community sample

~ Ghanaian Young Scientists ~

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<tr>
<th>2012年</th>
<th>01月24日</th>
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<td>5: ISAAC TUFFOUR</td>
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| Welcome to Japan. Kofo. We thank God for His travelling mercies. I am sure you will have a wonderful time here. As for me, I am wrapping up to come back to Ghana. My stay here has been a wonderful one. Last week was a “ocean tour week” so much work in the lab with good results obtained. We wound up the weekend at Huis Ten Bosch (a beautiful amusement park here in Sueko). Yesterday, I finished my sightseeing adventure at the Nagasaki Peace Park and Penguin aquarium. Today has been very busy for me. I just finished giving a presentation in my departmental journal club. It was awesome. I also gave a progress report on my experiments and work I have done here. I am grateful to all who made this trip possible. It has really given me good exposure. Dr Suntik, your hometown (Sasebo) is a wonderful place.

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<td>6: ISAAC TUFFOUR</td>
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| Last I forget, I saw snow fall for the first time today. It was really an amazing feeling even though the weather was quite cold.

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<td>7: Kofo Dadzie Korfie</td>
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| Hello everyone,

I thank you all for your advice and well wishes. Mitsuhiro-Sensei, Thank you so much for everything. Your advice really got me reflecting deeply. I will never lose focus. Indeed, this opportunity has inspired me to work harder, read more and learn as much as I can. I will once again, on behalf of my colleagues and on my own accord, express our deepest and profound appreciation to ALL who made it possible for us, EAAs, to visit Japan. Most especially Mr. Shig Oyama. This kind gesture will forever remain with us. I believe this will be a landmark in our journey to a bright and successful future as Scientists (As Mitsuhiro-Sensei will put it).

Donna angotou gozanme - translate to all of you, Yamashita-Sensei, Ohita-Sensei and Sicyama-Sensei. We really appreciate you all.

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<td>8: Kofo Dadzie Korfie</td>
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| Just like Isaac, I also had the opportunity to see snow fall, it was really a sight to behold. Even the people of Tokyo were very excited because it’s really hadn’t snowed in Tokyo in last six years. So you see, I brought snow to Tokyo! Indeed, I have also been in TMU and the reception was really great. I have started some parasite culturing to be used for Bioassays. I have also had the opportunity to visit AKITA EARA. They really got lots of amazing stuff. So far so good... Wish you all the best this week. Sayonara...  

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| eti Ghanaaryui ........ A friend in need is a friend indeed.
Voices of Friends of SATREPS members

“I used to work on groundwater projects in Africa. Now I'm hoping to put that experience to use again and meet lots of new people, too.” (Engineer, Japan)

“Communication is one of a researcher's jobs, but it's easily forgotten when the research work is interesting. Friends of SATREPS is a great opportunity to keep communicating.”
(Researcher, Japan)

“I am a science Journalist in Nigeria. I am also the station head of my station. I studied chemical engineering but practice journalism now.” (Journalist, Nigeria)
Friends of SATREPS

https://fos.go.jp

http://www.facebook.com/Friends.of.SATREPS

@SATREPS

Hash tag: #SATREPS
Exit Strategy (Target-oriented): Market Goods

Research Components

Development of Manufacturing Technology

Project Goals (Outputs)

Development of Treatment Systems and Facilities

Construction of Large-Scale Pilot Plants; Demonstration Experiments

Market Diffusion

Practical Demonstration / Application

Social Implementation

Research Undertaking Institutions:

(Japan) Universities etc.

(Counterpart Country) Research Institutes etc.

Research Institutions

Business Capitals, Venture Capitals, Program Grants (A-STEP, NEDO)

Enterprises (In Japan and Oversea) Entrepreneurs

Funder

Player

Manufacturing Companies, Market Players, Business Operation etc.

Baton Zone

SATREPS

5 Years

10 Years
Exit Strategy (Target-oriented): Public Goods

**Research Components**
- Establishment of countermeasures

**Project Goals (Outputs)**
- Formulation of Mitigation/Prevention Measures and Safety Scenarios
- Institutionalization in the Targeted Countries and Regions; Pilot Demonstration of Water/Law-carbon Infrastructure

**Practical Demonstration / Application**
- Public Dissemination

**Social Implementation**
- Research Undertaking Institutions:
  - (Japan) Universities etc.
  - (Counterpart Country) Research Institutes etc.
- Research Institutions
- **Funder**
  - Multilateral/Bilateral Development Banks (ADB, JBIC, etc.)
  - Funding from Counterpart Countries’ Central Governments and Municipalities
- **Player**
  - Government Agencies, NGOs, etc.

**SATREPS**

**Baton Zone**

5 Years

10 Years
Exit Strategy of SATREPS Projects (1)

「Development of Low Carbon Society Scenarios for Asian Regions」
(Malaysia)

**Research components**
- Methodology to create LCS scenarios which is appropriate for Malaysia is developed
- LCS scenarios are created and reflected for policy in IM
- Co-benefit of LCS policies is quantified in IM
- A network for LCS in Asia is established

**Research Goals**
- The development of methodology to create LCS scenarios (theory, process, model, guide)
- LCS scenarios are reflected for low carbon policy in IM
- Application of measures in IM to quantify co-benefits of LCS policies on air pollution
- Application of measures in IM to manage solid waste
- Organization arrangement of UTM to conduct trainings on LCS scenarios for Malaysia and Asian countries is consolidated, and a network for LCS in Asia is established

**Practical Demonstration / Application**
- Adaptation and implementation of low carbon planning policy in Iskandar, Malaysia

**Social Implementation**
- Development of low carbon society scenarios and policy adaptation and implementation in relation to scenarios for entire Malaysia as well as other Asian regions

**Research Undertaking Institutions**
- **Japanese Side:**
  - Kyoto University · Okayama University, National Institute for Environmental Studies
- **Malaysian Side:**
  - UTM · IRDA · JPBD

**Research Institutions**
- Malaysian Central Government · Local Authorities (IRDA, JPBD, Other Malaysian Local Authorities) · ADB (Asia Development Bank) etc
- Other Asian Nations · Local Researchers · Public Sectors
- Other Stakeholders (Developers, NPO, Industrial Waste Disposal Contractor, etc)

**Asian regions • Local research institutes, Central and local government**

**SATREPS**

**Baton Zone**

5 Years

10 Years
**Exit Strategy of SATREPS Projects (2)**

*「Innovation on Production and Automotive Utilization of Biofuels from Non-food Biomass」*

*(Thailand)*

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<tr>
<th>Research components</th>
<th>Research Goals (Outputs)</th>
<th>Practical Demonstration / Application</th>
<th>Social Implementation</th>
</tr>
</thead>
</table>
| 1. Production of Biodiesel fuel derived from Jatropha oil and its utilization | Safe production protocol based on the biodiesel fuel standard recommended in EAS  
- Proof-tested fuel quality in engine performance and emission |  
- Enforced fuel standard  
- Economic feasibility of Jatropha supply chain  
- Increase in supply of Jatropha in and out of Thailand  
- Biodiesel fuel export and import | Emergence of new bio-fuel businesses and Public Private Partnership (PPP) |
| 2. Utilization of Jatropha residue to produce liquid fuel and its application |  
- Production of bio-oil by rapid pyrolysis  
- Hydrocarbon fuel production by refining the bio-oil |  
- Standardization of the fuel quality  
- Testing with diverse biomass materials  
- Study of drop-in fuel marketability | |

**Research Undertaking Institutions:**

*Japanese Side:*
AIST, Waseda University

*Thai Side:*
NSTDA (MTEC), TISTR, KMUTNB

**Research Institutions**

- Corporate (Japan, Thailand, Vietnam): *Utilization of Jatropha, Production and commercialization of fuel*

**SATREPS**

**Baton Zone**

- 5 years
- 10 years

**Best Practice in PPP**

- Cultivation of Jatropha, Harvest, Oil press Value chain for Biodiesel fuel production and commercialization
- Standardization (ERIA Standard) Biodiesel Fuel in South-East Asia
- NEDO Establishment of large-scale plant
- ODA Coupling with capacity building
Exit Strategy of SATREPS Projects (3)

「Research on Ethanol Production from Sugarcane Wastes」
(Brazil)

**Research components**
- Development of Technologies on Ethanol Production from Sugarcane Wastes
- LCA including the effect on GHG emission reduction by developed technologies

**Research Goals (Output)**
- Develop highly efficient technologies of pretreatment, enzyme for saccharification and fermentation by bench-scale plant. (Target: more than 75% saccharification rate and more than 85% fermentation yield)
- Prove more than 20 percent of GHG reduction as compared to existing technologies with economic analysis

**Practical Demonstration / Application**
- Practical application of developed technologies to existing ethanol sugar factories
- Scale-up to pilot plant for commercial application

**Social Implementation**
- Business development on novel ethanol production from feedstock like sugarcane wastes

**Japanese Side:**
- National Institute of Advanced Technology (AIST)
- Brazil: Japan-Brazil Research Institutes

**Brazilian Side:**
- Federal University of Rio de Janeiro (UFRJ)
- Federal University of Santa Catarina (UFSC)

**Technology Transfer Funding**
- Development of commercial application

**SATREPS**
- Acceleration of research results by industry-academia-government collaboration

**Baton Zone**
- 5 years

**SATREPS**
- 10 years

**Expansion of developed technologies in other sugarcane production countries, especially Asia**
- Collaboration with Japanese and/or Brazilian enterprise(s) implementing ethanol business in Brazil