

# Science and Technology Cooperation on Global Issues

## International Cooperation Jointly Creating “Knowledge”

Global-scale problems including global warming, food issue, natural disaster and infectious disease have been increasingly complex. In particular, the influence on developing countries with vulnerable socio-economic infrastructures is critical. The international community is now required to work together to approach such problems, since it is hard for only individual countries or regions to tackle them. In addition to traditional cooperation systems, innovation by science and technology is also expected to play an important role in providing solutions for responding to complex and growing issues.

Under the circumstance, JICA initiated the cooperation<sup>1</sup> focusing on the utilization of science and technology in 2008. Based on Japan’s science and technology, JICA aims at creating newer “knowledge” by international joint research between Japan and developing countries, as well as solving global-scale issues by giving research outcomes back to the real world.

### ● Science and Technology Research Partnership for Sustainable Development (SATREPS)

#### 1. Overview

This program is designed to promote international joint research in which both Japanese research institutions and those of developing countries work together based upon the social needs in developing countries under the framework of JICA Technical Cooperation Project. Its aims are to acquire new knowledge and to utilize research outcomes to the benefit of the society with a view to resolving global issues such as the environment and energy, biological resources, disaster prevention, and infectious diseases.

#### 2. Objectives

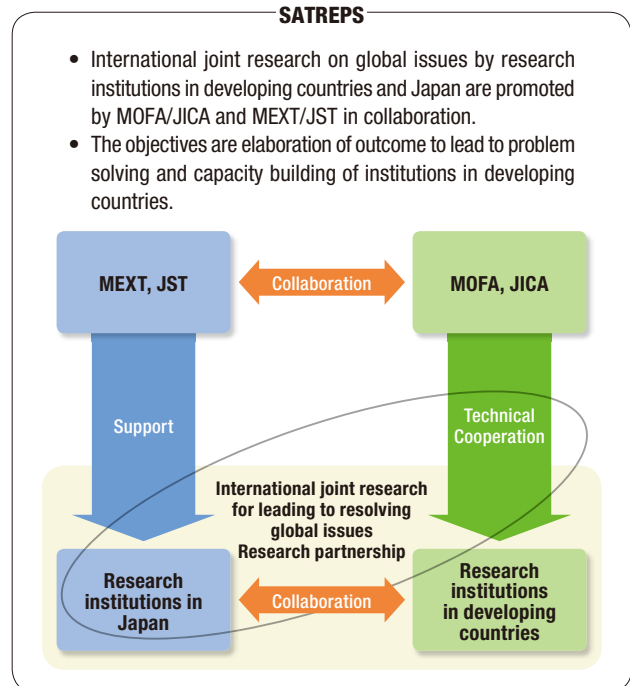
- 1) Acquire new knowledge leading to resolving global issues and advancing science and technology.
- 2) Build a framework for sustainable activities to contribute to solutions for global issues.
- 3) Improve the development of human resources and self-reliant research capability of developing country.

#### 3. Implementation System

SATREPS is jointly conducted by the Ministry of Foreign Affairs (MOFA), JICA, the Ministry of Education, Science and Culture (MEXT), and the Japan Science and Technology Agency (JST). In SATREPS, research proposals that are submitted from Japanese research institutions to JST are examined to see if they are consistent with research requests from developing countries (i.e., matching system), from the perspective of science and technology and ODA. Then, adopted proposals come into practice by research institutions in both Japan and developing countries, under the framework of JICA Technical Cooperation Project.

JICA provides financial support for developing countries conducting the researches (e.g., dispatch of Japanese researchers,

#### Implementation System of SATREPS



acceptance of their researchers, provision of equipment, and local activity expenses). On the other hand, JST supports research expenses necessary in Japan or third countries.

#### 4. Eligible Fields of Research

Research objects are four fields: environment and energy, biological resources, disaster prevention, and infectious disease. Specific research areas in each field are reviewed every year.

### ● Efforts in 2013

#### 1. Selection of Research Projects

From September to November 2012, JICA asked Japanese research institutions for SATREPS research proposals for 2013, and also upon that conducted a survey of developing countries on research requests. As a result, there were 91 matches among 98 proposals and 109 requests, and 10 research proposals were finally selected.

Research proposals adopted include four environment and energy fields (three environment areas and one low carbon area), one biological resources field, two disaster prevention fields, and three infectious disease fields<sup>2</sup>. Viewed geographically, these proposals consist of seven fields in Asia (four in South East Asia, one in East Asia, and two in South Asia), two fields in Central and South America, and one field in Africa.

1. Initially, the science and technology cooperation had two schemes: “The Science and Technology Research Partnership for Sustainable Development (SATREPS),” which was a technical assistance project model and “The Dispatch Program for Scientific and Technology Researchers” an individual expert dispatch model. However, the latter was finished in 2012.  
2. One of three infectious disease fields was also adopted as a multi-sectoral boundary area.

## 2. Implementation Status

With additional 10 proposals, SATREPS has adopted 77 research projects since 2008 when the project started, in cooperation with 39 countries including those in preparation and three new entrants.

Research proposals adopted includes 32 environment and energy fields, 17 biological resources fields, 14 disaster prevention fields, and 14 infectious disease fields. Viewed geographically, these proposals consist of 42 fields in Asia (32 in South East Asia and the Pacific, one in East Asia, and nine in

South Asia), 13 fields in Central and South America, 17 fields in Africa, and five fields in Middle East and Europe. In terms of percentage of the total, the Asian region is the largest with 54.5%, followed by the African region with 22.0%.

On the other hand, although 11 collaborative research projects were finished in 2013, SATREPS has produced many results in the field of environment and energy, biological resources, and infectious disease. These outcomes have been introduced to the real world.

### Case Study Zambia: Development of Diagnostic Methods for Tuberculosis and Trypanosomiasis and New Trypanosomal Medicines

## Succeeded in Developing Low-cost, Rapid Diagnostic Kit for Tuberculosis and Trypanosomiasis

**Hokkaido University and the University of Zambia have successfully developed methods for the early diagnosis of tuberculosis and trypanosomiasis from four-year collaborative research project in SATREPS.**

### Developing a Rapid Diagnostic Kit at a Low Cost

In recent years, occurrence of emerging or re-emerging infectious diseases including tuberculosis, new avian influenza, and Ebola hemorrhagic fever have posed enormous public threats. Especially, one-third of all human beings are estimated to be infected with tuberculosis. Every year, 1.4 million people have been killed by the disease mainly in Asian and African countries, and tuberculosis has been one of the most critical infectious diseases in Zambia.

Furthermore, it is estimated that trypanosomiasis, a disease that can be found in Sub-Saharan Africa, has left about 50,000

people dead each year. Since many people are misdiagnosed with malaria and die without receiving necessary treatment, it is essential to provide early diagnosis and proper treatment.

The Research Center for Zoonosis Control at Hokkaido University has conducted research activities in Zambia for many years. The representative research center of Hokkaido University carried out a collaborative research with the University Teaching Hospital and the School of Veterinary Medicine at the University of Zambia.

With the four-year collaborative research based on the diagnostic technique developed in Japan, the research team successfully developed a rapid diagnostic kit for tuberculosis

and trypanosomiasis. This development successfully reduces the examination cost to ¥100 per test (one-tenth of the traditional method), as well as shortening the testing time from a month to just 60 minutes.

Since all of the reagents used for the kit are dried powders, the diagnostic kit can be used at local clinic or examination room where cold chain is not installed.

Early diagnostics will contribute to providing appropriate treatment as early as possible and preventing pathogens from spreading. Hence, this development is expected to reduce the number of patients dying and suffering from tuberculosis and trypanosomiasis in affected countries or regions.

This research achieved a significant outcome in the aspect of cultivating human resources and enhancing the research system in Zambia.



A Japanese researcher developing rapid diagnostic kit



Japanese researchers with Zambian staff in the tuberculosis examination laboratory