

**“Project Formulation Survey”
under the Governmental
Commission on the Projects for
ODA Overseas Economic
Cooperation
in FY2013**

Final Report

Tanzania

**Study on an Introduction of Rice
Husk Briquette Machine**

Summary Report

March 2014

Tromso Co., Ltd. and E-Square Inc.

The content of this report is a summary of the project formulation survey, which was commissioned by the Ministry of Foreign Affairs of Japan in the FY 2013 and is carried out by the consortium (Tromso Co., Ltd. and E-Square Inc.). It does not represent the official view of the Ministry of Foreign Affairs.

I . Description of the current situation and development needs of the concerned development issues in the surveyed country

In Tanzania 400 thousand hectare of forest has been cut down every year for farm expansion, excessive pasturing and logging for making firewood and charcoal. Estimated loss of four million ha of forest between 2000 and 2010 is the fifth worst in the world. Moreover, forested land per capita has declined significantly from 6.3 ha as of 1960 to 0.7 ha at 2010. Especially deforestation in and around Dar es Salaam area is significant due to the recent population increase coupled with the expansion of residential area.

Since 2001, the government of Tanzania has launched afforestation campaign which targets to afforest 1.5 million trees in each district annually. Unfortunately it seems difficult to meet the target and the result shows it only catches up by the half of the pace of annual deforestation based on a research.

According to a study conducted by the United Nations, 94% of the household cooking fuel in Tanzania relies on biomass fuel such as firewood and charcoal. Increasing demand for firewood and charcoal caused by the growing population accelerates deforestation and devastated land which adversely affects the local farmers whose livings are dependent on natural resources. Under such circumstances, it is necessary to secure alternative fuels which can be substituted for firewood and charcoal.

In Tanzania 74 % percent of population live in rural area. While the basic needs poverty level in Tanzania urban area is 21.7 percent, the levels is 33.3 percent in rural areas. Job creation is needed especially in rural area.

II . Possible applicability of the SME's products and technologies, and prospects for future business development

Tromso Co., Ltd. possesses a unique technology to produce briquette fuels from underutilized rice husks by introducing its rice husk briquette machines to rice mills that are seeking for effective use of their rice husks.

The company plans to form alliances between local official organizations (KIDT, SIDO, DIT and etc.) to reduce manufacturing and maintenance cost, promote localization as well as develop a business model. This enables to provide machines at affordable price for Tanzanian market by expanding the ratio of local production except rather complex core parts that are related to grinding and briquetting structure. Tromso will establish business by providing training for production management and maintenance capacity and by providing core machinery parts.

III . Verification of adaptability of the SME's products and technologies to the surveyed country (Demonstration and pilot survey)

Demonstration programs were conducted to introduce the rice husk briquette machine at Dar es Salaam Institute of Technology (DIT) and Kilimanjaro Industrial Development Trust (KIDT) located in Moshi with 130 participants joining from the governments of Tanzania, NGOs, private sectors and Japanese aid organizations.

Through the programs Tromso has successfully demonstrated to produce high quality briquette fuels using Tanzanian long-grain rice husks which are different from Japanese short-grain type. The company received high interests in this machine from various sectors in Tanzania. In addition, we were able to form partnerships with relevant organizations (KID, SIDO and DIT) through this demonstration program.

IV. Expected development impact and effect on business development of the proposing SME in the surveyed country through proposed ODA projects

Rice husk briquettes can curb the demand for firewood and charcoal contributing to the prevention of further deforestation. One rice husk briquette machine can produce 180 ton of rice husk briquettes which have the equal the preservation of 22.5 ha of forest if the briquettes substitute for the same amount of charcoal. The forest preservation effect expands as more machines are installed.

Also, producing and selling the briquette fuels made from rice husks creates new business and employments (2.5 jobs created per machine). In addition, assembling the rice husk briquette machines, producing machinery parts and maintaining the machine in Tanzania result in technology transfer from Japan, which shall contribute to industrial development of Tanzania.

In order to commercialize the rice husk briquette machine, it is necessary to reduce the selling price from USD 63,000\$ in Japan to 30,000\$ in Tanzania considering the affordability. For that purpose, Tromso will simplify the structure and partly outsource the manufacturing and assembly of the machine to partners in Tanzania.

Tromso, can benefit from mass-production of core parts by expanding its market internationally. It will make a favorable impact to the domestic sales if the international sales result in cost reduction of core parts of the machine.

V. Proposals for formulating ODA projects

The current machine is relatively highly-priced because of its automation and safety features. It is required to simplify the structure with low production cost in order to penetrate within the Tanzanian market. It is also required to transfer technologies and know-hows for assembling the equipment, manufacturing the machinery parts and maintenance work. In addition, educational activities shall be organized as the briquette fuel business is not familiar in Tanzania at this point.

Tromso and E-Square propose to use the schemes of 'Pilot Survey for Disseminating Small and Medium Enterprises Technologies', 'Technical Cooperation, 'JICA Volunteer Program' and 'Grant Aid for Grassroots Human Security' to solve above issues.

Type (Project Formulation Survey)
Tanzania: Study on an Introduction of Rice Husk Briquette Machine

SMEs and Counterpart Organization

- Name of SME : Tromso Co., Ltd. and E-Square Inc.
- Location of SME : Hiroshima Pref., Japan
- Survey Site • Counterpart Organization : KIDT (Kilimanjaro Industrial Development Trust), SIDO (Small Industries Development Organization), Dar es Salaam Institute of Technology (DIT)

Concerned Development Issues

- Facing chronic energy shortage due to population growth, economic development and urbanization
- Rapid deforestation caused by increasing demand of firewood and charcoal used by over 90% of the nationality for cooking
- Lacking appropriate technology or know-how in order to utilize the rice husks which are byproducts of rice, one of the staple foods in Tanzania
- Rural area needs more employment opportunities

Products and Technologies of SMEs

- An innovative machine which can process rice husks into briquette fuels
- A proprietary technology to reduce maintenance frequency by unique mechanism and hard surfacing treatment technique
- While advanced technology is required in grinding, pressing and forming process, local sourcing and production are possible for other functions of the machine as the rest is relatively simply designed

Proposed ODA Projects and Expected Impact

- Introduce the rice husk briquette machine to local partners and promote localization of maintenance, assembling, production through MOFA/JICA's Pilot Survey for Disseminating SMEs Technologies and other schemes.
- Introduce the locally optimized machines to rice mills and large farms resulting in the preservation of forest and creating employment

Future Business Development of SMEs

- Tromso supplies the core parts of the machine and parts that is difficult to source locally. The company can reduce cost by producing and assembling other parts on a local basis.
- The cost reduction of core parts by mass-producing also reinforces Tromso's business within Japan

