

Kilimanjaro Industrial Development Trust  
Small Industries Development Organization

Summary Report

Tanzania

Verification Survey with the Private  
Sector for Disseminating Japanese  
Technologies  
for Utilization of Resources through Rice  
Husk Briquette Machines

April, 2017

Japan International Cooperation Agency  
Tromso Co., Ltd.

## 1. BACKGROUND

In Tanzania 400 thousand hectares (ha) of forest are cut down every year for farm expansion, excessive pasturing, and logging for making firewood and charcoal. The estimated loss of four million ha of forest between 2000 and 2010 is the fifth worst in the world. Deforestation in and around the Dar es Salaam area is especially significant due to the recent population increase coupled with the expansion of residential areas.

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 World Bank, 94% of household cooking fuel in Tanzania relies on biomass fuel such as firewood and charcoal<sup>1</sup>. Increasing demand for firewood and charcoal caused by the growing population accelerates deforestation and the increase in devastated land adversely affects the local farmers whose livings are dependent on natural resources. Forested land per capita has decreased sharply from 2.2 ha in 1990 to 0.9 ha in 2015.

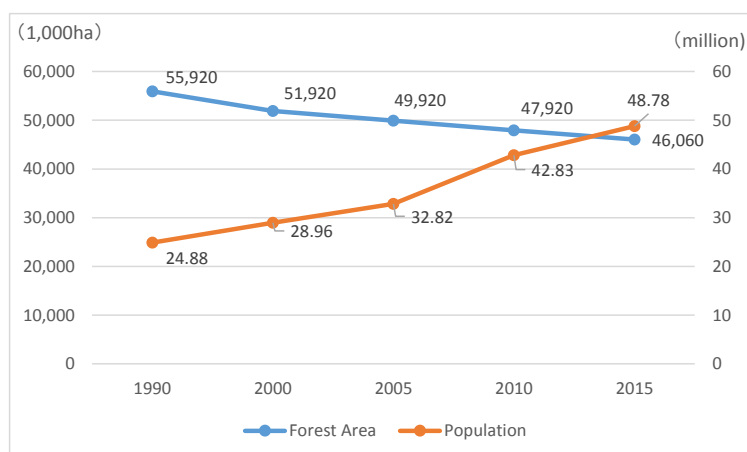


Figure 1 Forest area and population change

The demand for charcoal is projected to increase due to the population growth, the progress of urbanization, and the increasing price of alternative fuels (electricity and LPG).

Under such circumstances, it is necessary to secure alternative fuels which can be substituted for firewood and charcoal.

The Vice-President's Office (Union and Environment) in Tanzania announced a nationwide competition for alternative cooking energy in November 2016. The major objectives of the competition are to recognize, develop, and award innovators and entrepreneurs who promote the

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<sup>1</sup> The World Bank, Environmental Crisis or Sustainable Development Opportunity?, Transforming the charcoal sector in Tanzania, A Policy Note, March 2009

use, production, and distribution of sustainable cooking energy, according to a news report<sup>2</sup>. The first winner will get a prize of 300 million Tsh, the second 200 million Tsh, and the third 100 million Tsh, respectively, to be used for promoting the proposed alternative fuels. This campaign shows the seriousness of the Tanzanian government to tackle the issue of deforestation.

Rice is the second most produced crop after maize in Tanzania and the consumption and production of rice keeps growing. Tanzania is a member of the Coalition for African Rice Development (CARD) and developed the National Rice Development Strategy (NRDS) which aims to double rice production in ten years, reaching 1.963 million tons in 2018.

Through the threshing process, 20% of paddies will become rice husks, which means 0.39 million tons of rice husks will be produced in 2018 when rice production reaches 1.963 million tons. Though rice husks are currently used for local brick making and fueling cement factories in some areas, most of them are not fully used, sometimes causing environmental problems. As rice production rises, unused rice husks also increase, creating business opportunities for their utilization.

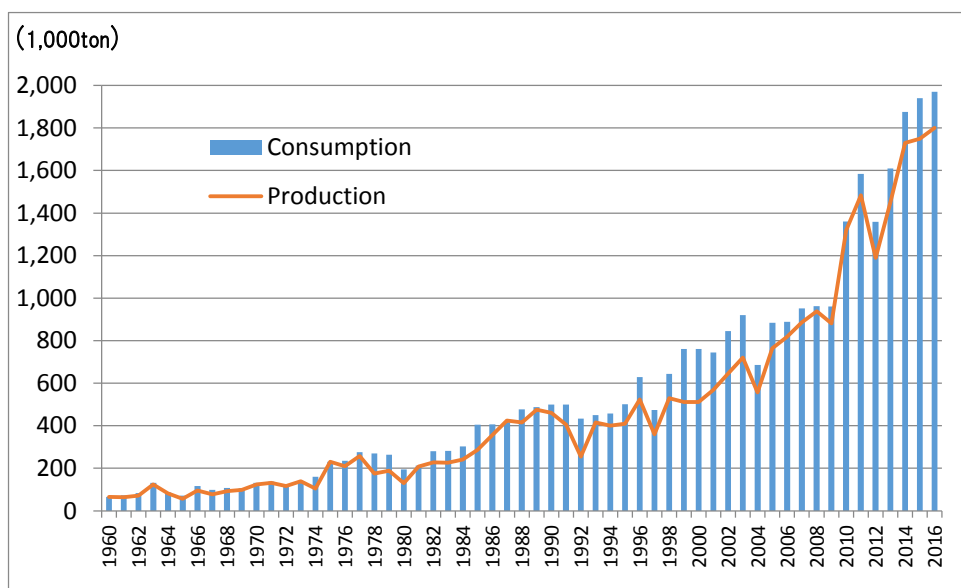


Figure 2 Rice consumption and production in Tanzania (1960-2016)

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 tons of rice husk briquettes yearly, of the equivalent of preserving 22.5 ha of forest if the briquettes are substituted for the same amount of charcoal. The forest preservation effect expands as more machines are installed.

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<sup>2</sup> <http://allafrica.com/stories/201611110353.html>

Producing and selling the briquette fuels made from rice husks also create new business and employment (2.5 jobs created per machine). In addition, assembling the rice husk briquette machines, producing machinery parts and maintaining the machines in Tanzania also result in a technology transfer from Japan, which contributes to the industrial development of Tanzania.

## **2. OUTLINE OF THE PILOT SURVEY FOR DISSEMINATING SME'S TECHNOLOGIES**

### **(1) Purpose**

- To confirm that Grind Mill (a rice husk briquette machine) can be operated normally in a Tanzanian environment and that enough rice husks can be procured as raw materials.
- To modify and reduce the cost of Grind Mill based on Tanzanian conditions and requirements.
- To train engineers of KIDT and SIDO to operate and maintain Grind Mill.
- To confirm the demand for rice husk briquettes and to affirm the profitability of the rice husk briquette making business.
- To raise the awareness of concerned parties and residents of Moshi and Mbeya about Grind Mill and rice husk briquettes.
- To implement local production, supply, and maintenance through a technology transfer to local machinery manufacturers.

### **(2) Activities**

#### **i. Verification of Grind Mill (modified Japan model)**

- Tromso installed four units of Grind Mill (modified Japan model) (two units in both the KIDT Moshi workshop and the SIDO Mbeya Rice Cluster).
- Tromso provided training to KIDT / SIDO engineers for the installation, operation, and maintenance of Grind Mill in Tanzania.
- KIDT / SIDO produced and marketed rice husk briquettes and provided the related data to Tromso.

#### **ii. Development of Grind Mill (Tanzania model) and technical training**

- Tromso collected feedback from KIDT / SIDO and findings from the survey.
- Tromso developed Grind Mill (Tanzania model) based on the feedback collected from KIDT / SIDO.
- Tromso invited two engineers from KIDT and two engineers from SIDO to Japan and provided them with training on manufacturing, assembly, and maintenance of Grind Mill.
- Tromso provided four units of Grind Mill (Tanzania model) (two units in KIDT Moshi workshop and two units at SIDO Mbeya Rice Cluster respectively).
- KIDT operated two Tanzania model Grind Mills and DEMACO operated two other machines under the supervision of SIDO and provided operation and market data to Tromso.

#### **iii. Verification of rice husk briquette manufacturing business**

- Tromso conducted surveys on rice mill owners and other potential users to determine the appropriate pricing and specifications of Grind Mill.
- Tromso compared the difference between the rice husk briquettes and conventional fuels.
- Tromso conducted surveys on the availability and the usage of rice husks in major rice production areas.



- Tromso conducted surveys with rice mill owners and other potential users of Grind Mill to grasp the appropriate price and specifications of the machine.
- Tromso evaluated the profitability of the rice husk briquette manufacturing business based on the above information.
- SIDO Mbeya transferred two Grind Mills (Tanzania model) to a machinery manufacturer, DEMACO Engineering in Morogoro, which has a strong interest in the manufacturing and operation of Grind Mill.

#### iv. Dissemination of Grind Mill

- KIDT / SIDO and Tromso held joint seminars to introduce Grind Mill and rice husk briquettes, inviting rice mill owners, large-scale farm owners, potential rice husk briquette users, local machinery manufacturers, and others.
- KIDT / SIDO and Tromso exhibited Grind Mill at trade fairs to introduce the machine and rice husk briquettes.
- Tromso selected local machinery manufacturers as partners for the local manufacturing and assembly of Grind Mill.
- Tromso provided training to engineers from the above selected manufacturers.
- Tromso conducted surveys on the number of potential users of Grind Mill to estimate the market size for Grind Mill.
- Tromso created a business model with which Tromso, local manufacturers, and Grind Mill owners can operate profitably.

### (3)Product/Technology to be Provided

Product name: Grind Mill (rice husk briquette machine)

<p>Specifications (Modified Japan Model)</p>	<ul style="list-style-type: none"> <li>• Production capacity: 120kg/h of rice husk briquettes</li> <li>• Weight: approx. 1,300kg</li> <li>• Size: 2.7m(L) x 1.3m(W) x 2.3m(H)</li> <li>• Electricity supply: AC400V/3φ 50Hz AC200V/1φ 50Hz</li> <li>• Electricity Consumption: approx. 16kW (maximum 20kW)</li> <li>• Rice husk supply: automated</li> <li>• *The Japan model is modified to be operated with AC400V/3e</li> </ul> 
<p>Specifications (Tanzania Model)</p>	<ul style="list-style-type: none"> <li>• Production capacity: 120kg/h of rice husk briquettes</li> <li>• Weight: approx. 850 kg</li> <li>• Size: 2.3m(L) x 1.05m(W) x 1.4m(H)</li> <li>• Electricity supply: AC400V/3φ 50Hz AC200V/1φ 50Hz</li> <li>• Electricity consumption: approx. 16kW (maximum 19kW)</li> <li>• Rice husk supply: manual</li> </ul> 

Features	<ul style="list-style-type: none"> <li>· Simplified briquette cutting system</li> <li>· Grind Mill is a compact unit which can pulverize and produce rice husk briquettes efficiently.</li> <li>· Rice husk briquettes (caloric value of approx. 4,000 kcal/kg) are a 100% natural fuel which do not emit NOx or SOx during combustion.</li> </ul>
Comparative superiorities	<ul style="list-style-type: none"> <li>· Can produce rice husk briquettes immediately when supplied with rice husks and connected to electricity.</li> <li>· High durability using core parts treated with hard surface materials.</li> <li>· Robust operational performance without interruption.</li> <li>· Safety features including a covered rotating body.</li> </ul>

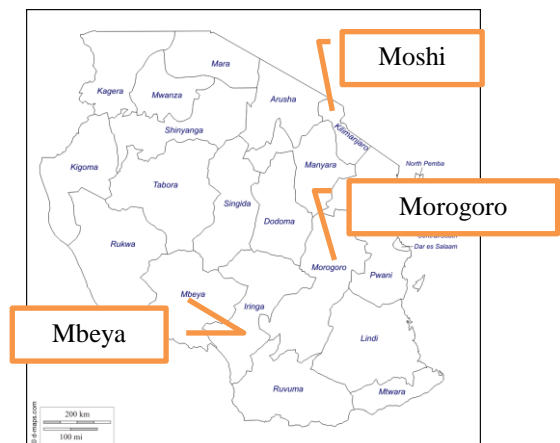
**(4)Counterpart Organizations**

Kilimanjaro Industrial Development Trust (KIDT)  
Small Industries Development Organization (SIDO)

**(5)Target Area and Beneficiaries**

**i. Target Area**

- Moshi, Kilimanjaro Region
- Mbeya, Mbeya Region
- Morogoro, Morogoro Region



**ii. Beneficiaries:**

- Machinery manufacturers and workers
- Rice mill owners and investors
- General public

**(6)Duration**

From 30 September, 2014 to 31 May, 2017





## **(9)Implementation System**

<Tanzania Side>

Kilimanjaro Industrial Development Trust (KIDT)

Small Industries Development Organization (SIDO)

DEMACO Engineering (under the supervision of SIDO)

<Japan Side>

JICA (contractor)

Tromso Co., Ltd. (contractee, survey implementation)

E-Square Inc. (consultant)

Organic Solutions Japan LTD (consultant)

### 3. ACHIEVEMENT OF THE SURVEY

#### (1) Outputs and Outcomes of the Survey

##### i. Production and Sales Activities of KIDT and SIDO Mbeya

KIDT and SIDO Mbeya operated Grind Mills and marketed rice husk briquettes made by the machines. The production and sales records are shown below. Most of the sales were for commercial users which were mostly schools, hospitals, restaurants, and other institutions with large kitchens for cooking meals. KIDT sold the briquettes for 300Tsh/kg while SIDO Mbeya sold them for 200Tsh/kg. The price difference can be explained as the higher market acceptability of Moshi compared with Mbeya.

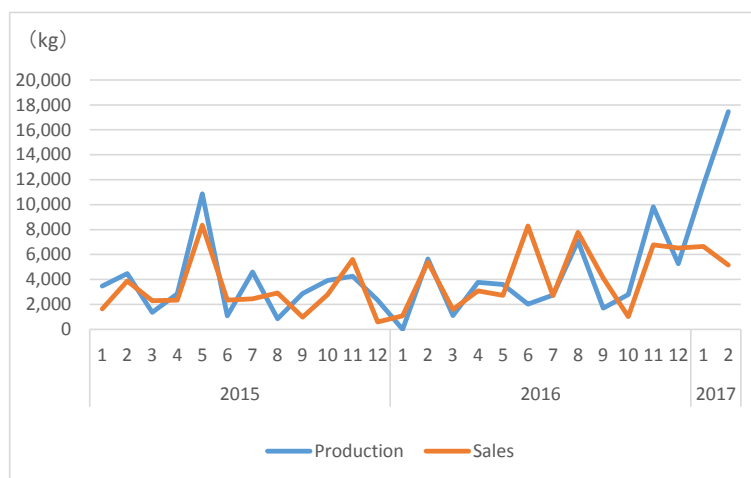


Figure 3 Production and sales activities of KIDT

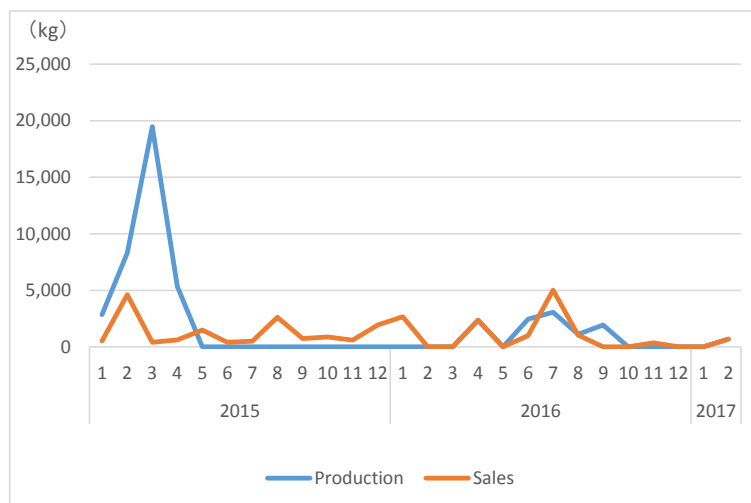


Figure 4 Production and sales activities of SIDO

DEMACO Engineering in Morogoro received two Grind Mills (Tanzania model) in November 2016 and operated the machines under the supervision of SIDO. Morogoro is one of the major rice producing regions and has a large amount of unused rice husks in town, as well as good access

to Dar es Salaam, by far the largest market in Tanzania.

DEMACO Engineering focused on the improvement of rice husk briquettes rather than sales activities for the first several months and developed mixed briquettes using coal powder allanblackia powder (oil cake) together with rice husks. The mixed briquette has a higher calorific value, is easy to light, and has less smoke compared with normal rice husk briquettes. DEMACO is planning to sell the mixed briquettes for 350Tsh/kg to institutional users in Morogoro and Dar es Salaam.

## ii. Market Analysis for the Rice Husk Briquette

As rice husk briquettes are free of wood, using them contributes to forest conservation. However, they have different characteristics from conventional solid fuels, such as firewood and charcoal. While rice husk briquettes burn for a longer time than firewood and charcoal, they tend to emit more smoke and are more difficult to light compared with these. If the briquettes are chopped up by machete, thin briquettes become easier to light and emit less smoke. However, this method could not be popularized during the survey. DEMACO Engineering's efforts to making improved briquettes by mixing other materials offers a potential solution to making rice husk briquettes more attractive.

Table 1 Comparison of three kinds of fuel

	Rice husk briquettes	Firewood	Charcoal
Price	200 (Mbeya)-300 (Moshi) Tsh/kg	100-200Tsh/kg	500-800Tsh/kg
Calorific value	3 3,500kcal/kg	2 4,000kcal/kg	1 6,800kcal
Ignition	3 (takes time)	1	2
Power	3 (not so strong)	2	1
Smoke	3 (at the beginning)	2	1
Burning time	1 (long)	3	2
Handling	1 (same size / not dirty)	3 (should be split)	2 (dirty)
Remaining ash	3 (much)*can be used as fertilizer	2	1 (few)
Forest conservation	1	2	3 (loss of calorific value by carbonization)

\*1 means No. 1, 2 means No.2 and 3 means No.3 out of three

The fuel market can be divided into the below three segments.

Table 2 Segmentation of fuel market

Segment	Main use of briquettes	Prevalence of kitchens with chimneys	Comments
Residential use	Outdoor cooking at home	Not common	Smoke can be a problem
Commercial use	Cooking inside kitchens of restaurant, school, hotel, prison and other institutions	Varies according to areas	Can be substitute for firewood and charcoal
Industrial use	Boiler fuel for tea factory, sement factory, textile mill, tobacco factory	Common (e.g. industrial boiler)	Planted acacia log and coal are cheaper

Through the marketing activities of rice husk briquettes by KIDT and SIDO Mbeya, it was revealed that users who do not have kitchens with chimneys tend to claim that the fuel is difficult to light and emits more smoke compared with conventional fuels. On the other hand, institutional users with chimneys acknowledged the advantages of rice husk briquettes. Some schools, restaurants and hospitals in Moshi regularly buy rice husk briquettes. For industrial use, as planted acacia logs and coal are much cheaper, rice husk briquettes are not competitive in terms of price. Therefore commercial users with chimneys should be the first target for rice husk briquettes.

### iii. Profitability Analysis of Rice Husk Briquette Manufacturing Business

Profitability calculations were carried out assuming a purchase price for Grind Mill of 40 million Tsh with an annual depreciation of 15% and 19,200kg production (8 hours x 20 days = 160 hours operation) per month. According to the P/L Case 1 (Table 3), about half of the total cost is attributable to consumable, or spare parts replacement costs. The recent rise of electricity prices, the revision of the VAT Act, and the weakening of the Tanzania Shilling negatively affect the profitability of the business and profit per month is 170,666Tsh (3% of sales). Such result will not be considered profitable enough for most entrepreneurs and the reduction of consumable costs or an increase in briquette price will be needed.

Table 3 P/L Case 1: production/sales of 19,200kg / month with a T1 electricity contract

	(Tsh)	(JPY)	Comment	% of sales
<b>Sales (A)</b>	<b>5,760,000</b>	<b>345,600</b>	@300Tsh/kg×19,200kg	100.0%
Rice husk procurement	192,000	11,520	19,200kg×10Tsh/kg	3.3%
Electricity	911,974	54,718	292Tsh/kWh (T1) +Tax22%、 16kW/h	15.8%
Depreciation of the machine	500,000	30,000	2.4 million JPY/machine 15% depreciation/year	8.7%

Consumables	2,892,693	173,562	1,085JPY/h	50.2%
Maintenance	16,667	1,000		0.3%
Labor cost	400,000	24,000	200,000Tsh/m×2	6.9%
Labor management	100,000	6,000	200,000Tsh/m×0.5 名	1.7%
House rent	0	0	Use existing house	0.0%
<b>Total manufacturing cost (B)</b>	<b>5,013,334</b>	<b>300,800</b>		<b>87.0%</b>
<b>Sales cost (C)</b>	<b>576,000</b>	<b>34,560</b>	10% of sales	<b>10.0%</b>
<b>Total cost (D=B+C)</b>	<b>5,589,334</b>	<b>335,360</b>		<b>97.0%</b>
<b>Profit (E=A-D)</b>	<b>170,666</b>	<b>10,240</b>		<b>3.0%</b>

Below is a break-even analysis of briquette business according to the sales amount per month. The business becomes profitable if more than 15 tons per month are sold. Considering the machine can produce 120kg per hour, this level of production can be achieved without difficulty if the electricity supply is constant.

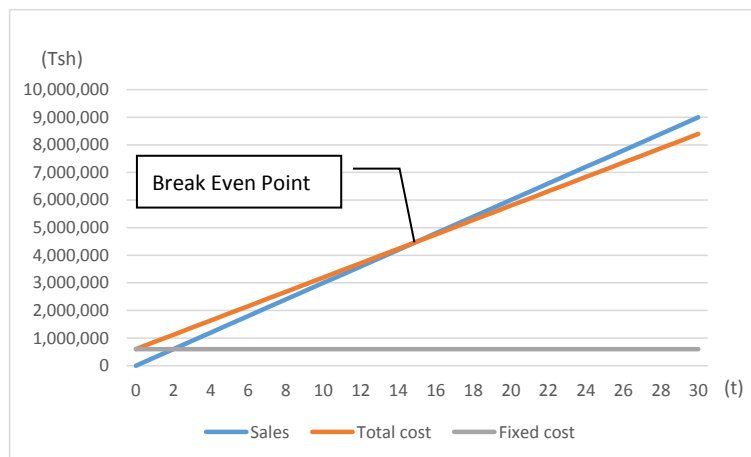


Figure 5 Break-even analysis of briquette business

TANESCO's T2 electricity tariff is applied for P/L Case 2 for large-scale electricity users (7,500kW / month) such as KIDT, SIDO, and DEMACO Engineering. The business will be a little bit more profitable compared with the T1 case.

Table 4 P/L Case 2: production/sales of 19,200kg / month with a T2 electricity contract

	(Tsh)	(JPY)	Comment	% of sales
<b>Sales (A)</b>	5,760,000	345,600	@300Tsh/kg×19,200kg	100.0%
Rice husk procurement	192,000	11,520	19,200kg×10Tsh/kg	3.3%
Electricity	626,388	37,583	<b>195Tsh/kWh</b> <b>14,233Tsh(T2)+Tax22%</b> 16kW/h	+ 10.9%

Depreciation of the machine	500,000	30,000	2.4 million JPY/machine 15% depreciation/year	8.7%
Comsumables	2,892,693	173,562	1,085JPY/h	50.2%
Maintenance	16,667	1,000		0.3%
Labor cost	400,000	24,000	200,000Tsh/m×2	6.9%
Labor management	100,000	6,000	200,000Tsh/m×0.5 名	1.7%
House rent	0	0	Use existing house	0.0%
<b>Total manufacturing cost (B)</b>	<b>4,727,748</b>	<b>283,665</b>		<b>82.1%</b>
<b>Sales cost (C)</b>	<b>576,000</b>	<b>34,560</b>	10% of sales	<b>10.0%</b>
<b>Total cost (D=B+C)</b>	<b>5,303,748</b>	<b>318,225</b>		<b>92.1%</b>
<b>Profit (E=A-D)</b>	<b>456,252</b>	<b>27,375</b>		<b>7.9%</b>

The cost of consumables is halved with Case 3, which has a high profitability of 28.5%.

Table 5 P/L Case 3: production/sales 19,200kg / month with reduction of consumables

	(Tsh)	(JPY)	Comment	% of sales
<b>Sales (A)</b>	<b>5,760,000</b>	<b>345,600</b>	@300Tsh/kg×19,200kg	<b>100.0%</b>
Rice husk procurement	192,000	11,520	19,200kg×10Tsh/kg	3.3%
Electricity	911,974	54,718	292Tsh/kWh (T1/TanESCO) +Tax22%、16kW/h	15.8%
Depreciation of the machine	416,667	25,000	<b>2 million JPY/machine</b> 15% depreciation/year	7.2%
Comsumables	1,506,347	90,381	565JPY/h	26.2%
Maintenance	16,667	1,000		0.3%
Labor cost	400,000	24,000	200,000Tsh/m×2	6.9%
Labor management	100,000	6,000	200,000Tsh/m×0.5 名	1.7%
House rent	0	0	Use existing house	0.0%
<b>Total manufacturing cost (B)</b>	<b>3,543,654</b>	<b>212,619</b>		<b>61.5%</b>
<b>Sales cost (C)</b>	<b>576,000</b>	<b>34,560</b>	10% of sales	<b>10.0%</b>
<b>Total cost (D=B+C)</b>	<b>4,119,654</b>	<b>247,179</b>		<b>71.5%</b>
<b>Profit (E=A-D)</b>	<b>1,640,346</b>	<b>98,421</b>		<b>28.5%</b>

If the price of briquettes is increased from 300Tsh/kg to 400Tsh/kg, the improvement of profitability from 3% to 24.7% is also significant.

Table 6 P/L Case 4: production/sales 19,200kg / month with increase of briquette price

	(Tsh)	(JPY)	Comment	% of sales
<b>Sales (A)</b>	<b>7,680,000</b>	<b>460,800</b>	@ <b>400Tsh/kg</b> × <b>19,200kg</b>	<b>100.0%</b>

Rice husk procurement	192,000	11,520	19,200kg×10Tsh/kg	2.5%
Electricity	911,974	54,718	292Tsh/kWh (T1/TanESCO) +Tax22%、16kW/h	11.9%
Depreciation of the machine	500,000	30,000	2.4 million JPY/machine 15% depreciation/year	6.5%
Consumables	2,892,693	173,562	1,085JPY/h	37.7%
Maintenance	16,667	1,000		0.2%
Labor cost	400,000	24,000	200,000Tsh/m×2	5.2%
Labor management	100,000	6,000	200,000Tsh/m×0.5 名	1.3%
House rent	0	0	Use existing house	0.0%
<b>Total manufacturing cost (B)</b>	<b>5,013,334</b>	<b>300,800</b>		<b>65.3%</b>
<b>Sales cost (C)</b>	<b>768,000</b>	<b>46,080</b>	10% of sales	<b>10.0%</b>
<b>Total cost (D=B+C)</b>	<b>5,781,334</b>	<b>346,880</b>		<b>75.3%</b>
<b>Profit (E=A-D)</b>	<b>1,898,666</b>	<b>113,920</b>		<b>24.7%</b>

Cost reductions for consumables and a search for better markets where briquette manufacturers can sell their products for higher prices are crucial and will positively affect the profitability of briquette business.

#### iv. Proposed Business Model in Tanzania

In order to disseminate the briquette machines and briquettes themselves, these should be affordable in the Tanzanian market.

If Tromso manufactures the machine and exports it to Tanzania, the total cost, including manufacturing, shipping, import levies, VAT, and inland transportation, will become very high, resulting in a higher price for the machine. As an alternative to this export business model, Tromso proposed a collaboration model with local machinery manufacturers who would build the machines using parts provided by Tromso (Figure 6). Local machinery manufacturers would source common parts in Tanzania, excluding the core parts which grind and compress rice husks and some electrical parts which cannot be found in the local market.

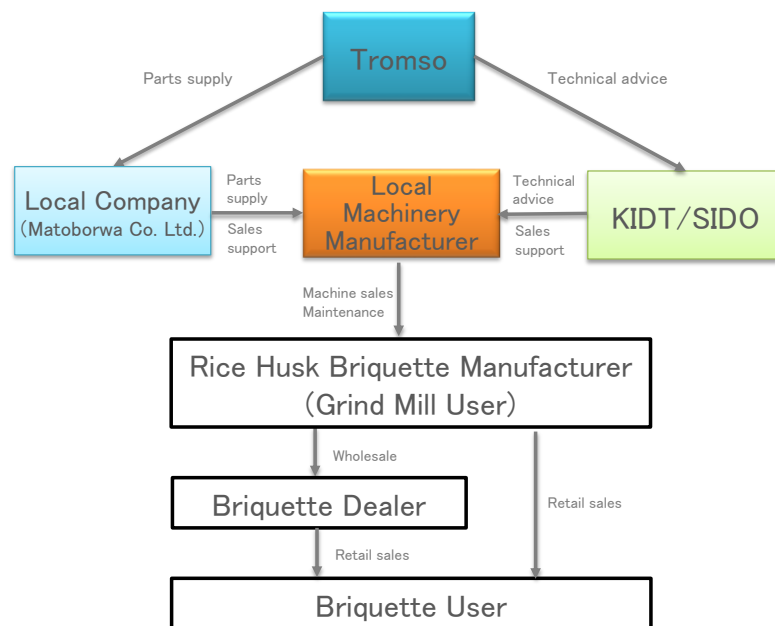


Figure 6 Business scheme

#### v. Remaining Challenges

Unfortunately, none of the Grind Mill operators were able to achieve a high enough utilization ratio for the machines during the survey to make profit if the machines and consumable parts were bought for value. Tromso will continue to support the activities of KIDT, SIDO, and DEMACO Engineering to make the briquette business lucrative enough for investors. Tromso will also continue its effort to reduce the cost of the consumables and other key parts which cannot be sourced in Tanzania in order to reduce both the initial and running cost of the machine. Repairing consumable parts by welding rods in Tanzania can reduce the overall cost of operation by cutting the need for new parts. As special welding rods using ultra hard metal are needed for repairing the consumable parts, Tromso is ready to supply them from Japan.

#### (2) Self-reliant and Continual Activities to be Conducted by Counterpart Organizations

The counterpart organizations are requested to utilize the Grind Mills and related parts granted by the government of Japan even after the survey, abiding by the instruction manuals provided by Tromso. As the aim of both counterpart organizations is development of the private sector, it is recommended for the organizations to transfer the technology acquired from this project to the private sector as SIDO has done for DEMACO Engineering in Morogoro.

SIDO has shown its commitment to use two Grind Mills at SIDO Mbeya as a training facility and a showcase for briquette technology, continuously support DEMACO Engineering in Morogoro to market Grind Mills and rice husk briquettes and lobby governments to support rice husk briquettes at a policy level.



## **4. FUTURE PROSPECTS**

### **(1) Impact and Effect on the Concerned Development Issues through Business Development of the Product/ Technology in the Surveyed Country**

The government of Tanzania aims to increase rice production to 1.96 million tons of paddy in 2018 when 0.39 million tons of rice husks will be discharged. On the other hand, one Grind Mill can save 22.5 ha of forest per year if it produces 180 tons of rice husk briquettes to replace the same amount of charcoal.

The manufacturing of briquette machines and briquettes will create a new industry and new jobs in Tanzania, contributing to the industrialization of the country.

### **(2) Lessons Learned and Recommendation through the Survey**

#### **i. Early Involvement of the Private Sector could be Considered**

After a series of discussions with SIDO and JICA, two Grind Mills were transferred to DEMACO Engineering in November 2016, which began practical verification activities in Morogoro. As the future business of Grind Mill manufacturing and operation will be borne by the private sector, the transfer of the machines and a deep involvement of the private sector could be considered at an earlier stage of the survey.

#### **ii. Government Support for Dissemination of Rice Husk Briquettes can be Effective**

As rice husk briquettes are completely new to the general public, central and local governments' support for the fuel can be effective to encourage Tanzanian people to adopt the new fuel. The Vice-President's Office's nationwide competition for alternative energy in November 2016 can be a good opportunity to make rice husk briquette more popular.

#### **iii. Dissemination of Fuel-efficient Cooking Stoves and Kitchens with Chimneys will Support the Dissemination of Briquettes**

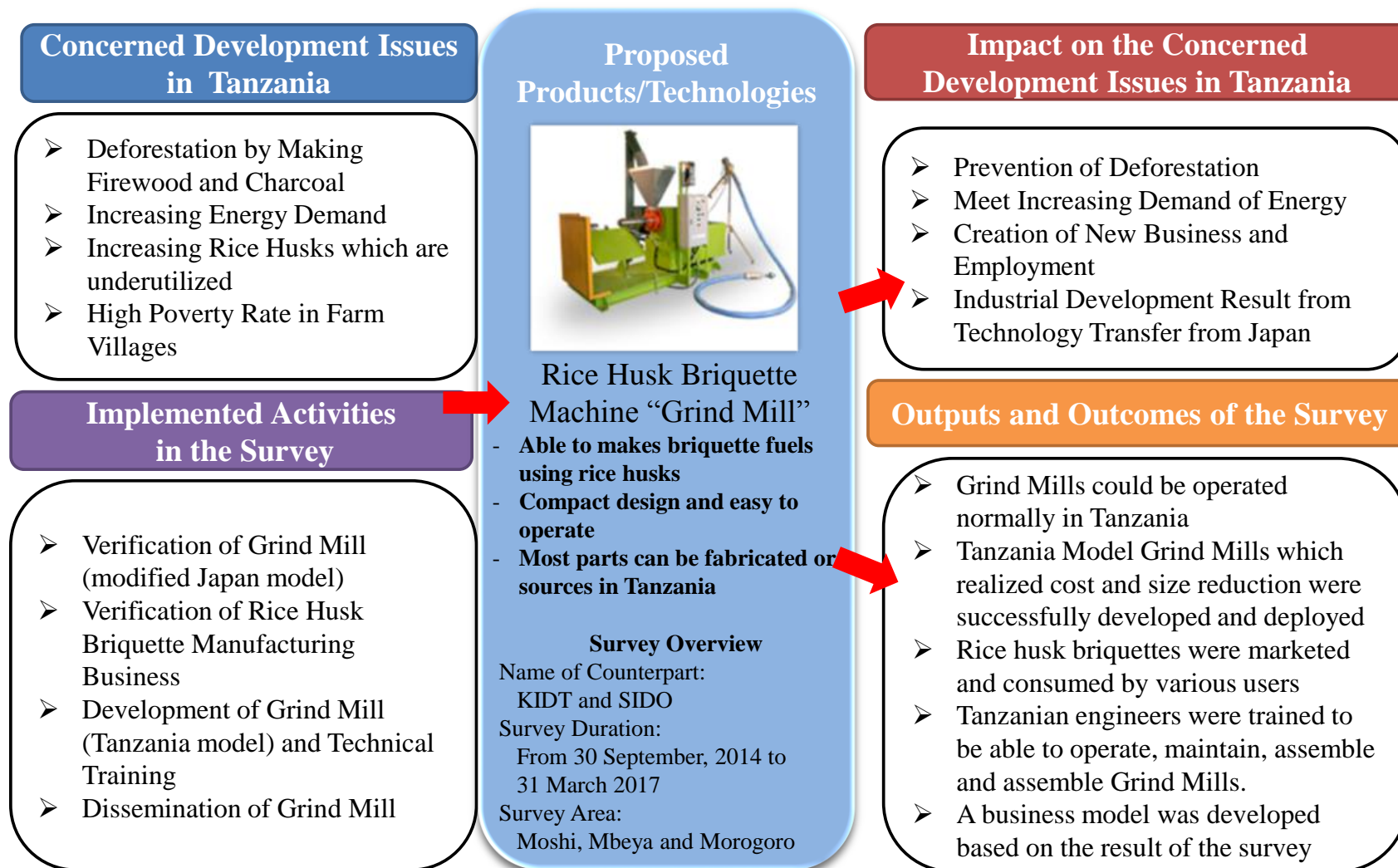
It was revealed that residential users (the general public) did not like the smoke emitted from rice husk briquettes at the early stage of combustion. Though three-stone stoves or simple tin stoves are still prevalent in Tanzania, if kitchens with chimneys or fuel efficient cooking stoves become popular, less fuel will be needed for cooking and briquettes will be more easily adopted. Tanzanian government can play an important role to support the dissemination of such stoves.

#### **iv. Exemption of VAT for Grind Mill and Related Parts will Reduce the Cost of the Briquette Machines and Related Parts**

The revised VAT Act became effective on 1 July 2015. Although most agricultural machines used to be exempt from VAT, the range of exemption was narrowed significantly. As a result, Grind Mill and its related parts became subject to VAT, adding a huge cost of 18% or more for users. As agriculture remains the utmost priority in Tanzania, agricultural machines, including Grind Mill, should once again be exempt from VAT.

**Tanzania**

**Verification Survey with the Private Sector for Disseminating Japanese technologies for Utilization of Resources Through Rice Husk Briquette Machines  
Tromso Co., Ltd., Hiroshima Japan**



ATTACHMENT 2: PICTURES TAKEN DURING THE SURVEY

	
<p>1: Demonstration event at KIDT</p>	<p>2: Tape cutting event by the RAS of Mbeya Regionat SIDO's project site</p>
	
<p>3: Grind Mills at SIDO's project site in Mbeya</p>	<p>4: Test marketing of rice husk briquettes in Morogoro</p>
	
<p>5: Rice mills in Morogoro with large quantities of rice husks</p>	<p>6: Test marketing of rice husk briquettes</p>



7:  
Shipping of rice husk briquettes by KIDT



8:  
A restaurant user of rice husk briquettes in Mbeya



9:  
Training session for KIDT and SIDO engineers at Tromso's workshop in Japan



10:  
Participation in Nanenane exhibition in Mbeya



11:  
DEMACO Engineering's mixed briquette



12:  
DEMACO Engineering's demonstration event