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Article

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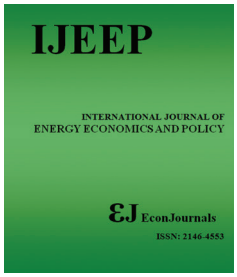

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Fostering Clean and Healthy Energy in Rural Communities: Lessons from the Indonesia Clean Stove Initiative Pilot Program

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ABSTRACT

Most of rural people still use traditional wood-fired stoves in their daily life but it was classified as unclean, unhealthy, and inefficient. Indoor air pollution caused by the burning of solid fuels in traditional stoves is one of the leading risk factors attributed to mortality and burden of disease. This paper is aimed to reveal efforts to promote using of clean cook stove among households in rural areas. Based on technological touch followed by laboratory tests, clean stoves are claimed have its efficiency in fuel use and its capacity on reducing negative impact levels for its users such as suppress levels of carbon dioxide, fine dust, and smoke. By having the clean stove initiative pilot program, it is expected that lessons learned from the pilot program would create sustainable market for clean cook stoves in Indonesia because most consumers respond positively to the presence of a clean, healthy and energy-efficient stoves.

Keywords: Clean Energy, Clean Stove, Consumer
JEL Classification: Q280

1. INTRODUCTION

Right to health as a human rights shall be respected, protected, and fulfilled by the state without exception. It has clearly been stated in the international covenant on economic, social, and cultural rights (ICESCR) that has been ratified by the Government of Indonesia by Law No. 11 of 2005. Article 12 point 1 of the ICESCR confirms that the States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. Therefore efforts to achieve higher health condition should be developed by the state through the concrete programs that could be felt its result(s) by the public.

Meanwhile, in consumer protection point of view, right to healthy environment is one of essential consumer right. In this case government intervention is strongly required to encourage the improvement of public health degree. The right to environmental health confirmed that consumers should be protected from the devastating effects of air, earth, and water pollution that may result from the performance of daily marketplace operations. Consumers have the right to live and work in an environment that does not threaten the well-being of present and future generations.

However it is fact that rural consumers still use traditional wood-fired stoves in their daily cooking. In rural Indonesia, household incomes and living standards are significantly lower; electricity is rarely used for cooking, and three-stone stoves utilizing traditional biomass fuels are quite common. Unfortunately it was classified as unclean, unhealthy, and inefficient. Indoor air pollution caused by the burning of solid fuels in traditional stoves is one of the leading risk factors attributed to mortality and burden of disease. Household air pollution resulting from the incomplete combustion of solid fuels is linked to some 4 million premature deaths each year (Yabei and Adams, 2015). Indeed there are many reasons behind their unhealthy cooking habit such as poverty, lack of awareness, and limited access to clean stove. Therefore without intervention

of government and other potential parties, it is difficult to change and increase their health degree. Radulescu and Radulescu (2011) notes that healthy environment is no longer regarded as an area that falls exclusively under the control of government or community, but rather a responsibility shared by a number of interest groups: Enterprises, financial institutions, managers, creditors, contractors, consumers as well as the public at large.

On top of that this article aims to describe one of the program initiated by the World Bank in collaboration with Directorate of Bioenergy of the Ministry of Energy and Mineral Resources that is Indonesia clean stove initiative (CSI) launched in early 2012. To support the CSI, a pilot program is being launched with the following objectives: (1) To pilot the results base financing (RBF) approach and (2) to generate lessons learned for the future national scale-up that aims to achieve universal access to clean cooking in Indonesia. Indonesia CSI purposes to scale up access to clean and efficient cooking solutions in Indonesia through capacity building, policy development, and support of government action plans. In the context of Indonesia CSI program, it comprises of four phases. The first part centers on initial stock taking, which is critical for developing the intervention strategy, designing subsequent program phases, and establishing policy dialogue with the country's institutional focal point. The second stage focuses on required institutional strengthening, capacity building, and piloting the program. The third one scales up program implementation, while the fourth centers on program evaluation and dissemination of lessons learned (Voravate, 2014).

However this paper will merely be focused on the implementing of piloting the program in which RBF was chosen as an approach. RBF is a concept comprising a range of public policy instruments, whereby incentives, rewards, or subsidies are linked to the verified delivery of pre-defined results. RBF is often used to enhance access to and delivery of basic infrastructure and social services, such as improved access to water and sanitation, energy, and health care. In most cases, the funding entity - typically a government, development agency, or other agent - deals directly with the service provider e.g., private firm, public utility, civil society organization, or financial institution (Yohanes, 2014).

The fundamental idea for RBF subsidy method is that subsidy payments that would otherwise be made automatically are made contingent on delivery of pre-agreed result(s), with achievement of the result(s) being subject to independent verification. Based on this idea, the main objective of monitoring and verification (M and V) activities are to independently monitor and verify that certified clean stoves are sold by market aggregator and are bought and used by end-users/households. Market Aggregators are defined as those who apply for the pilot program subsidy incentives and are willing to take investment and performance risks. The confirmation from independent monitor and verification team will allow participating market aggregator who promote and sell certified clean stove under RBF subsidy pilot program receive subsidy payment from the program.

Based upon the authors experience who get involved in the Indonesia CSI Pilot program, especially in carrying out the assignments of M and V process [which is an fundamental part in RBF subsidy approach], this paper would like to show and identify interesting facts in distributing and using of clean stoves in consumers' level. The dynamics of project implementation will also be analyzed as well as its challenges. Respectively will be presented the General Scheme of Indonesia CSI Pilot Program, Fact Finding and its discussion as well as lesson learned which can be taken during the implementation of the pilot, and Conclusion.

2. GENERAL SCHEME OF INDONESIA CSI PILOT PROGRAM

2.1. Spreading the Use of Healthy and Energy-Efficient Biomass Stove

It is fact that potential renewable energy such as: Biomass, geothermal, solar energy, water energy, wind energy, and ocean energy, to date not many utilized. Biomass energy includes wood, agricultural/plantation/forest waste, organic components from industry and household, animal waste. Biomass converted into energy in the form of liquid fuels, gas, heat, and electricity (Indonesia Ministry of Energy and Mineral Resources, 2003). To encourage the development and utilization of renewable energy, especially biomass, and to improve the efficiency of energy use in Indonesia, it is needed for renewable energy and energy conservation policies as a reference for the development of renewable energy and energy conservation in Indonesia to support sustainable development.

However development of renewable energy must reach rural consumers as well. Therefore using of traditional wood-fired stoves in rural consumers' daily cooking (that was classified as unclean, unhealthy, and inefficient), should be intervened so that it becomes clean, healthy and efficient. To mitigate the negative impacts of the above conditions, one effort may be to develop a healthy and energy-efficient biomass stove (TSHE) taking into account that rural and remote households will continue to use biomass stoves. TSHE are claimed based upon technological touch followed by laboratory tests in order to ensure its efficiency in fuel use and its capacity on reducing negative impact levels for its users such as suppress levels of carbon dioxide, fine dust, and smoke.

Nevertheless availability of TSHE is still very limited. One of the obstacles is that today's traditional marketed stoves manufactured by crafters provide very low profit margins from the entire supply chain value process. This condition leads to the need for a new business model that can provide a better and sustainable profit margin.

Developing of TSHE is according to the Regulation of the Minister of Energy and Mineral Resources No. 39 of 2017 on the Implementation of Physical Activity Utilization of New Energy and Renewable Energy and Energy Conservation. This regulation states that one of the Scope of Physical Activity for Utilization of New Energy and Renewable Energy and Energy Conservation as referred to in Article 3 (c) in the form of development, procurement and/or installation is: Energy efficiency equipment. In addition, according to Article 11 (1c) Government Regulation No. 79 of

2014 about National Energy Policy, priority of energy development is done by prioritizing local energy resources. The development of TSHE will be increasingly important as it can support Indonesia in achieving sustainable development goals (SDG), which include poverty alleviation, health quality improvement, gender equality and climate change (Wira, 2016).

2.2. Result Based Financing (RBF) SCHEME in the Energy Sector

The design of the pilot program's results-based financing approach includes selecting eligible stoves for promotion based on a trial stove performance assessment system, allocating performance-based incentives, and implementing a M and V system. A public campaign was conducted to raise awareness and stimulate demand for clean cooking technology. Advisory services related to stove designs, technology and marketing also be available to assist stove producers and designers.

The fundamental idea of RBF approaches is that payments that would otherwise be made automatically are made contingent on delivery of a pre agreed (set of) result(s), with achievement of the result(s) being subject to independent verification. There has been increasing interest in whether and how they could be used within the energy sector to deliver more, or more cost-effective, results but, to date, relatively little work has been done on the circumstances in which different versions may be best employed. RBF can be used as a means to disburse subsidies in a market. In turn, subsidies should primarily be used to address the problem of positive externalities: When there are benefits to society as a whole from greater production or consumption of a good or service but this is not taken into account by those making the production or consumption decision. In these circumstances, subsidies can align private and social interests, and boost output in a market (ESMAP, 2013).

As the main component for the second phase of Indonesia CSI, the pilot program is piloting RBF subsidy which aims to provide incentive to participating Market Aggregators to promote the sales of clean cook-stoves. It is expected that lessons learned from the pilot program using RBF subsidy would enable Indonesia CSI to fine tune the third and fourth phase of Indonesia CSI and ultimately create sustainable market for clean cook-stoves in Indonesia.

The methodology used to M and V is vital to reliably confirm that end-users/households have bought and used certified clean stove. Moreover, monitor and verification is fundamental for RBF subsidy. However, M and V are relatively difficult to implement, costly, and time consuming. Therefore, adopting reliable methods that make difficult task a little bit easier and faster to implement as well as cost less is a challenge.

2.3. Area Coverage of the Pilot Program

Despite substantial progress on achieving universal electricity access in the region, almost half the population in Southeast Asia continues to rely primarily on biomass to meet their cooking needs. Actually not only in Asia region but it also happened in across sub-Saharan Africa. Around 2.6 billion people relied worldwide on the traditional use of biomass for cooking in 2010 (49% of the population) while the traditional use of biomass for cooking in Africa covers 698 million people (68% of the population), of which 696 Million people live in Sub-Saharan Africa; accounting for a population share ranging between 75% and 96% in different African countries (Scarlat et al., 2015). Within Southeast Asia there are a number of country-level initiatives that are aimed at the dissemination of improved cook-stoves. Many of these initiatives, for example in Cambodia, Lao PDR, and Myanmar, are supported by international donors like the European Union. In Indonesia the World Bank has been working closely with the Indonesian government to support the dissemination of high-quality improved cook-stoves (Smart Village, 2015). It means that efforts to increase healthy degree of households by disseminating improved cook-stoves have become general program in the Southeast Asia region.

In the beginning area coverage of the Indonesia CSI Pilot Program covers two provinces that is Yogyakarta Special Province and Central Java (2015). Both regions are characterized by high population density, abundant biomass resources, coverage by the LPG conversion program, and a good logistics network. In these two provinces, the rate of fuelwood use is about 40 percent; yet the region's high population density means that this percentage represents a large number of households. An estimated 4 million households in these areas still rely on biomass as their primary household fuel. Owing to the Indonesian government's Kerosene-to-LPG Conversion Program, which heavily targets provinces in Central Java and Yogyakarta, LPG is taking a greater market share, while kerosene use has decreased sharply (Yohanes, 2014). And in the second phase (2016), the pilot program is expanded to the East Nusa Tenggara (NTT) province. This province has low population density, high reliance on scarce biomass resources, and a poor logistics network. It is not covered by the LPG conversion program (It was proven in the implementation of the pilot program in Central Java and Yogyakarta, the existing of LPG in the market especially three kilos bright green gas tube quite influenced people to buying and using of clean stove). By comparing among those regions, the achievement and dynamic of the program implementation (along with its different conditions and cultures) will be more attractive.

2.4. Parties Who Get Involved and Each Responsibility

Pilot program under the World Bank's CSI implemented in China and Indonesia. The World Bank in collaboration with Directorate of Bioenergy of the Ministry of Energy and Mineral Resources launched Indonesia CSI in early 2012. However implementation of the pilot just runs in late 2014 because its preparations such as laboratory testing of cook-stoves, inviting Market Aggregators who's interested in this project, defining independent body who will responsible as M and V team, and so on.

Indonesia CSI Pilot program involving several parties with each responsibility. They are:

a. Groupe Energies Renouvelables, Environnement et Solidarités (GERES) is a French non-profit NGO created in 1976 that provide support through the StovePlus program. Funded by the French Global Environment Fund (FGEF or FFEM), StovePlus aims at facilitating access to improved cooking solutions, by providing technical support to project developers around the world. StovePlus offer service packages designed

to respond to the most pressing needs of project developers working in Southeast Asia and West Africa. GERES Biomass Energy Lab (G-BEL), based in Cambodia, provide technical support to the pilot testing laboratory. In participating into this pilot program StovePlus positions itself as a facilitator between policy makers and project holders on the field;

b. Yogyakarta Consumer Institute (Lembaga Konsumen Yogyakarta/LKY) is an Indonesian consumer organization established in 1978. The vision of LKY is to realizing justice for the entire consumer society. To achieve this, LKY has some missions: To develop critical awareness of consumers; to build of consumer solidarity; to encourage establishing of strong and critical consumer groups; to assist of weakness and poor consumers; and to struggle for consumer justice. In this pilot, LKY appointed as an independent body who has responsible in M and V process. Because of specific reason, especially in NTT area, LKY develop cooperation with Alfa Omega Foundation/AOF (an NGO based in Kupang) in implementing monitoring and verification stage.
c. Dian Desa Foundation (Yayasan Dian Desa/YDD) or "light of the village foundation" is a non-governmental organization (NGO) active in community development activities with a special focus on the development of appropriate technology. In 1972 that group was registered as a formal organization and become YDD. In the Indonesia CSI pilot program YDD responsibly in stoves testing and promoting Energy Saving Healthy Stoves to people so that people will replace their traditional stoves with healthier, energy-efficient stoves with less smoke and less fuel. The various stoves that have been developed and passed the test are then disseminated to the public. The socialization of energy-efficient energy stove is done by direct demonstration. What is demonstrated is the cooking activity by using a stove that has passed the test. Focused on cooking demonstrations, peoples can see things like: Fuel efficiency, speed/cooking time, smoke burning, and structure or interior of the stove.
d. Bank Rakyat Indonesia. Bank BRI appointed to manage the RBF fund or subsidy payment agency. Based upon each monitoring and verification report issued by LKY, BRI provide subsidy to each Market Aggregator according to their sales achievement. The amount of the subsidy is determined based on the type of stove sold and the quantity of the sales.
e. Market aggregators (MA). Market Aggregators are defined as those who apply for the pilot program subsidy incentives and are willing to take investment and performance risks. They may include stove producers, wholesalers, retailers, and other private companies which ensure that the stoves meet the technical requirements set forth in the stove testing certification criteria. In this pilot program there are ten MAs who get involved in marketing clean stove, they are: Kopernik Foundation, PT. Ditana Energy Solutions, CV. Bedog Education Center, CV. Kedung Artha Abisatya, UD. Dian Handycraft, CV. Agro Jawa Dwipa, PT. Pancaran Sinar Berkah, CV. Kaya Wahana Sentosa, CV. Cito 13, and PT. Ivy Lentera Lestari.

2.5. Monitoring and Verification (M and V) Framework

M and V is one of the most important activities for RBF subsidy pilot program since subsidy payments are tied with verifiable results. To ensure that this key activity is carried out, M and V team be assembled to basically monitor and verify that certified clean stoves are sold and bought and used by the end□users/households. To insure independent and impartiality, M and V team be out-sourced to work independently. However, the World Bank team and pilot program partner group for the environment, renewable energy and solidarity (GERES) closely supervise as well as provide technical guidance to the team to carry out the assignment (Indonesia CSI, 2015).

To ensure that certified clean stove sold to consumers can be monitored and verified, MAs that promote and sell certified clean stove under the RBF subsidy pilot program are required to develop and submit sales report. The sales report works like a tracking system which will enable monitor and verification team to follow up and confirm that clean stove sold under the pilot program are actually bought and used by end-users/households. Sales report at a minimum include: (1) Total numbers of certified clean stove sold under the pilot program, (2) serial number of all stoves sold, and (3) name, address and telephone number of end users/households that bought clean stove. It is critical that sales report must include all necessary information to locate end-users/households and stoves bought under the pilot project are actually used.

Methods to be employed for monitoring and verification involve three steps processes:

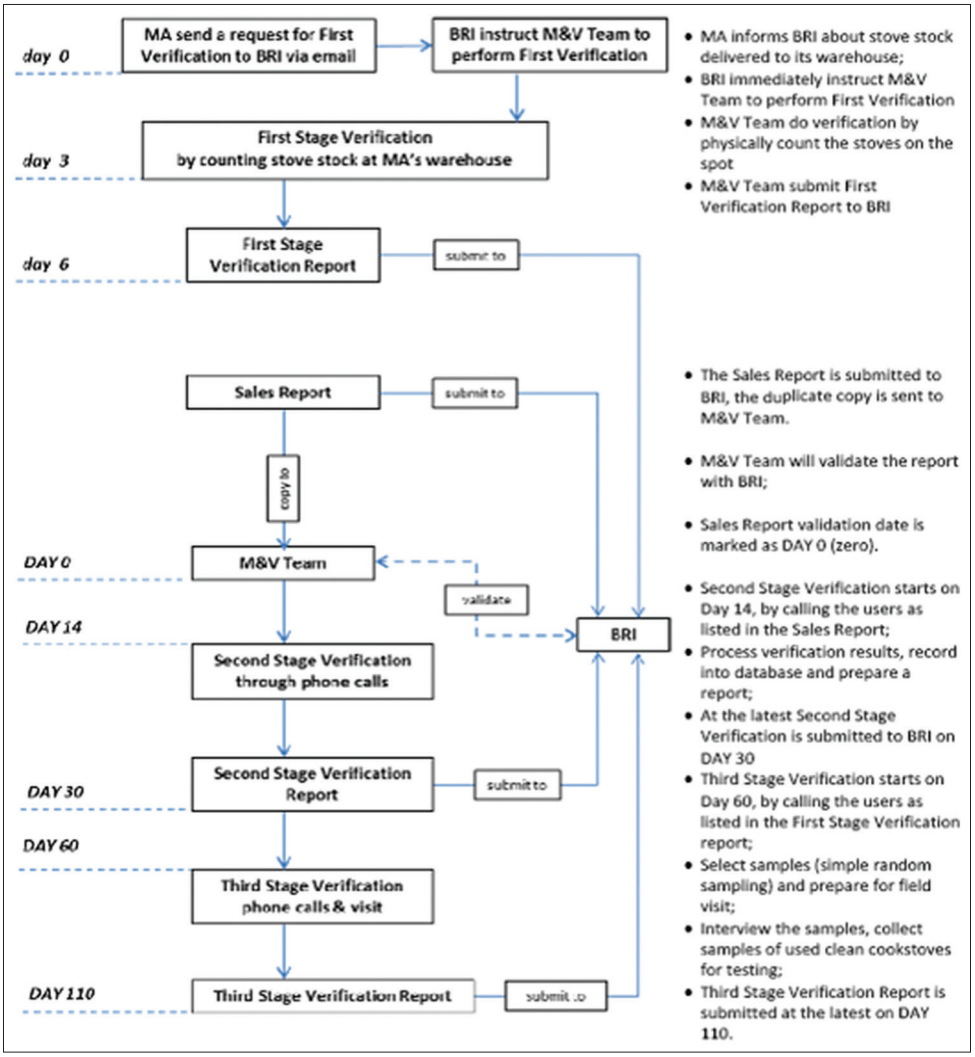
1. First stage verification requires active effort of MA to inform monitoring and verification team on the quantity and types of clean stoves have been purchased and delivered into their warehouse. Some purchasing and delivering documents needed to be verified by M and V team;
2. Second stage involves seeking confirmation from end-users/households whether they have bought certified stoves under the pilot program. This stage is conducted by calling each stove buyer as reported on the sales report by phone;
3. The third verification involves verifying whether end-users/households have been using the certified stove that they have bought. In this step M and V conducts sampling process based on certain criteria then conducting direct visit to each consumer who has been specified as a sample.

The general process of monitoring and verification can be seen in Figure 1.

3. FACT FINDING AND DISCUSSIONS

The CSI program start from February 2016 to April 2017 located in 3 (three) areas; Central Java-Yogyakarta Special Province (CJY) and East Nusa Tenggara (NTT). The MAs marketing 6 (six) types of clean stove; Prime Square Fuelwood (PSF), Prime Square Granular (PSG), UB Pellet (UBP), UB Kayu (UBK), Amarta (ART), and Keren Super two (KS2). And the 10 (ten) MAs who marketing clean stove are; PT. Ditana Energy Solutions (DES), Kopernik Foundation (KOP), CV. Agro Jawa Dwipa (AJD), CV. Bedog Education Center (BEC), UD. Dian Handycraft (DIH), CV. Kaya Wahana Sentosa (KWA), CV. Cito 13 (CIT), CV. Kedung Arta Abisatya (KAR), CV. Pancaran Sinar Berkah (PSB), and PT. Ivy Lentera Lestari (IVY). However there are only three of MA

Figure 1: Operational charts for monitor and verification



have selling the stove in East Nusa Tenggara (NTT); e.g., PT. Ditana Energy Solutions, CV. Agro Jawa Dwipa, and Kopernik Foundation (Figure 2 MAs of CSI Program).

The total respondents are 2160 (who buyer the clean stove) consists of 47% women and 53% men (Figure 3 sex of the respondents). The characteristic of respondents CSI's profession varies from, goverment official, entrepreneur, farmer, architect, poultry, teacher, construction laborers, midwife, and housewives. The respondent purchase the clean stove from resellers/agents, the nearby houses (demo how to use the stove are available), office offering with variety of price, approximately IDR 50.000 - IDR 500.000, either cash or with installments. Some of the clean stove however are given for free (LKY, 2017).

From Figure 3, it shows men respondents a bit higher than women, this probably due to the price of clean stove are related to gender relation in terms of purchasing goods (YDD, 2017). For an amount of <IDR 50.000 women or the wife can decide by themselves. And the decision making on the hands of the wife or women decrease by the increase of the amount to be spent, when the clean stove amount is above IDR 50.000 most decision have to be taken together by the husband and wife.

In Figure 4, it shows the respondents are consisting of owners of 31% Amarta (ART) stoves, 31% Prime Stove Fuelwood (PSF) stoves, 20% UB Pelllet (UBP) stoves, 8% Keren Super two (KST) stoves, 7% UB Kayu (UBK) stoves, and 3% Prime Stove Granular (PSG) stoves.

The respondents quite satisfied with the using of Prime Stove Fuelwood stove and intend to buy the stove again when it is broken (LKY, 2017). While the number of Prime Pellet Stoves are small because it is not easy to find the fuel pellet (YDD, 2017). The Amarta stove seemed to be the most unwanted commercially as some respondent is free gifts, and the rest stove sold at IDR 50.000-100.000 (LKY, 2016). The respondent also get the UB Pellet stove for free (LKY, 2017).

In Figure 5, it shows the cover areas of clean stove. 25% clean stove purchase in Central Java, 34% DI.Yogyakarta, and 41% East Nusa Tenggaran (NTT). In Central Java areas, this including: Semarang Kota and Kabupaten Semarang (Semarang Regency), Salatiga, Sukoharjo, Solo, Pati, Kudus, Jepara, Purworejo, Magelang, Banjarnegara, Blora, Boyolali, Klaten, Rembang, Banyumas, Kendal, Temanggung, Demak, Ambarawa, Cilacap, Kebumen, Grobogan, Tegal, Purbalingga, Wonogiri, Pemalang, Brebes, and

Figure 2: Sex of respondent

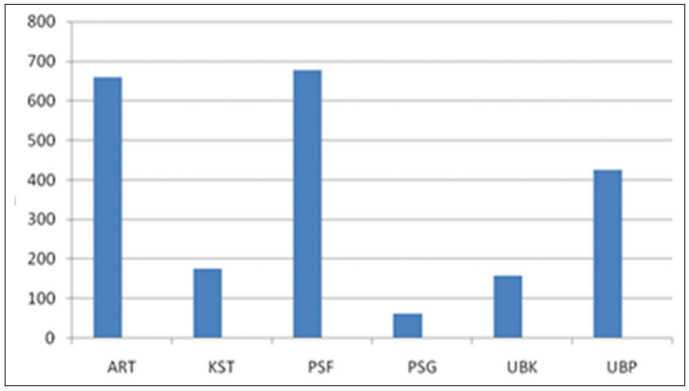


Figure 3: Type of clean stoves

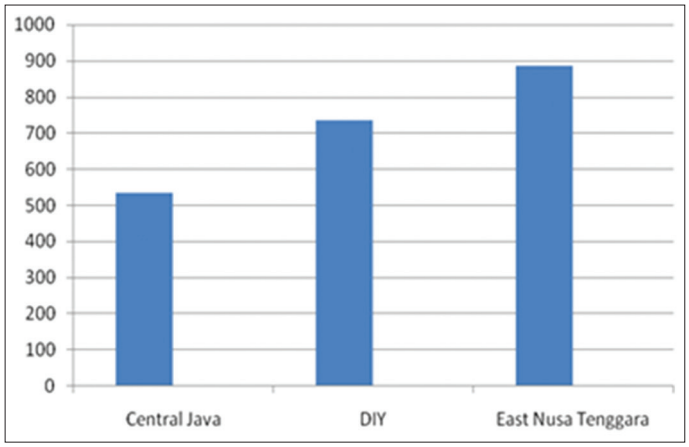


Figure 4: Piloting areas of clean stove initiative program

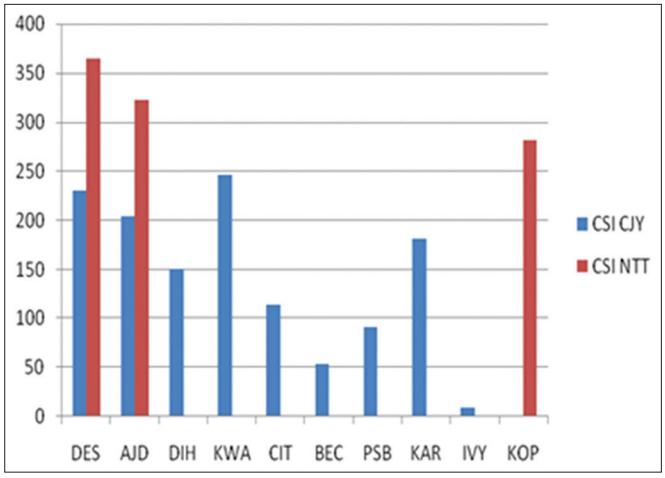
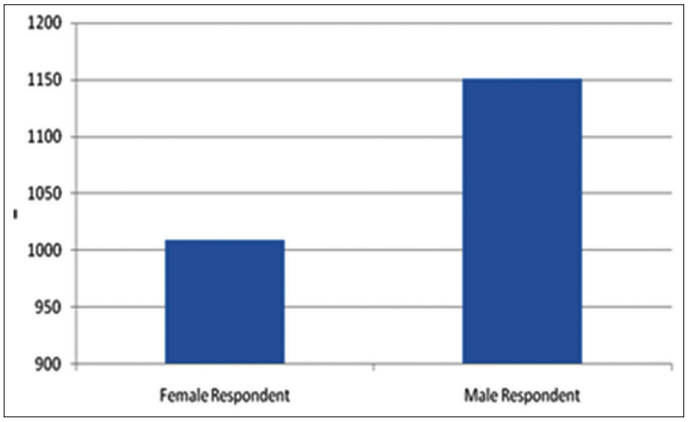


Figure 5: Market aggregators of clean stove initiative program in pilot areas program



Wonosobo. In DI.Yogyakarta, it cover 5 regencies; Bantul, Sleman, DI.Yogyakarta Kota, Kulon Progo and Gunung Kidul. In East Nusa Tenggara, it consist of 5 islands; Timor Island (Kupang Kabupaten, Kota Kupang, Belu, Timor Tengah Selatan, Timor Tengah Utara), Flores Island (Manggarai Barat, Manggarai Timur, Ngada, Sika, Nagakeo, Ende, Flores Timor), Rote Island (Rote Ndao), Sumba Island (Sumba Barat), Lomlen Island (Lembata).

The dynamic of submitting sales report by MA shows that each MA has different ability to prepare and arrange it. It can be seen on their business scale and/or company structures in which the bigger company will get better stove's selling achievement. Figure 2 shows MA's cover areas in selling clean stove. From 2160 clean stove, PT. Ditana Energy Solutions (DES) sell 27.5% of clean stove both in Central Java, DI. Yogyakarta and NTT; Kopernik Foundation (KOP) sell 9.2% of clean stove only in NTT areas; CV. Agro Jawa Dwipa (AJD) sell 24.4% of clean stove in CJY and NTT areas; CV. Bedog Education Center (BEC) sell 2.5% of clean stove in CJY areas; UD. Dian Handycraft (DIH) sell 6.9% of clean stove in CJY areas; CV. Karya Wahana Sentosa (KWA) sell 11.3% of clean stove in CJY areas; CV. Cito 13 (CIT) sell 5.3% of clean stove in CJY areas; CV. Kedung Arta Abisatya (KAR) sell 8.4% of clean stove in CJY areas; CV. Pancaran Sinar Berkah (PSB) sell 4.2% of clean stove in CJY areas; and PT. Ivy Lentera Lestari (IVY) sell only 0.4% clean stove in Central Java.

Meanwhile for MA categorized as small and medium enterprises or local company faces some difficulties to sell clean stove, at least it could be seen from their selling achievement. Moreover this project did not consider the various ability of each MA; all of them have to follow the same rules and requirements. Another indicator that showing different performance of MA was the correctness and accuracy in completing sales report. Albeit many factors could influences degree of sales report accuracy, one of the main element related to the designing of sales report was availability and readiness of MA's human resources.

Figure 6 shows the participation of the respondent captured by LKY in verification Stage 2. M and V team have to make phone call to all clean stove purchasers in 3 times calls on different days and hours and accompanied by sending text. The results confirm of the second stage verification categorized/classified into 3 grups: NR (Not Reached) for respondent not reached, NC (Not Confirmed) for respondent stating no purchase/not cooperating, and C (confirmed) for respondent confirms the purchase of the clean stove. From Figure above it shows the percentage of participation respondent/end-users in Central Java and Yogyakarta (CJY) also East Nusa Tenggara (NTT). In CJY, there are 45% NR; 44% C; 10% NC; while in NTT: 61% NR; 32% C; 7% NC. The not reached categorized is very high, both in CJY and NTT. This factors related to the contact number of the end-users is not available or it is not the end-users telephone number on the list of sales report but the re-seller/agent. Yet, the respondents is not

answer the calls/texts from M and V team. Other issues is that the consumers/buyers answer the phone but cannot substantiate the clean stove serial number which is the requirement procedur in second verification stage. As mention above, the issue of accuracy and correctness of sales report from MAs is a matter of concern.

Meanwhile Figure 7 shows participation of respondent in verification Stage 3. In this Third Stage Verification, not all of the buyers of the clean stove must be verified. Statistical sampling technique used as represent the number of households to be visited for interviews (Indonesia CSI, 2015). And the sample selection conducted by purposive random sampling methods, i.e selecting the sample with specific purpose and proporsional from cluster/region that has the largest number of clean stoves. The result of the third verification that is confirmation of continue use of the stove categorized into 3 (three) groups; NM (not met) for respondents that could not be reach/found; Y (Yes) for respondents who state using and continued use the stove; N (No) for respondents that state not use or not continue use the stove. The M and V team found that in CJY there are 23% NM; 24% Y; and 53% N, in NTT; 62% NM, 25% Y; and 13% N.

In CJY, the number of Not use or Not continue use the stove quite high. This is due to the available of LPG stove (clean stove was as a back-up stove when LPG was not available). Other reason it that the clean stove was difficult to use/impractical (difficult to lit and difficult to fill the fuelwood - need to cut the fuelwood into small piecies). That following reasons for those who never use to stove or ever use the stove then STOP to use the stove are quite similar with the survey conducted of YDD related to the result and impact of the CSI implement programme (YDD, 2017). Meanwhile, in NTT, the reason why respondent not use or not continue use the clean stove because the available of kerosene stove. Almost all household in NTT have kerosene stove (Tempo Weekly, 2016). The use of kerosene stove to emit less smoke if comparing with the traditional stove (permanent/brick). However, kerosene stove is more expensive to use. Since the local housewives reject LPG stove for fear of explosion, the CSI is one solution. This is why the use of clean stove in NTT a bit higher than in CJY, or even higher than the Not use or not continue use presentage in NTT.

However, the not met condition in NTT is very high (more than 50%). This is because of incomplete address of the buyers, and the buyers/end-users contact number is not available. In this case, the accuracy in completing sales report is a matter of concern. Others concern is that, the respondent/buyer is not the end-users of the clean stove. It is agent/re-seller who purchase the clean stove. As has been reported in one of the Third Verification Report, in this case the sales report from PT. Agro Java Dwipa, where only one name listed for 322 clean stove (LKY, 2017).

In many documents of Third Verification Report, M and V team found that the respondents satisfied with the use of the clean stove. They state that the clean stove is efficient and economist. The clean stove can use less fuel compared to LPG and kerosene. This finding inline with the YDD survey report of the impact of the CSI programme in Yogyakarta, July 2017. The respondents also favour that the clean stove can be moved (moveable) especially

Figure 6: Participation of respondent in verification stage 2

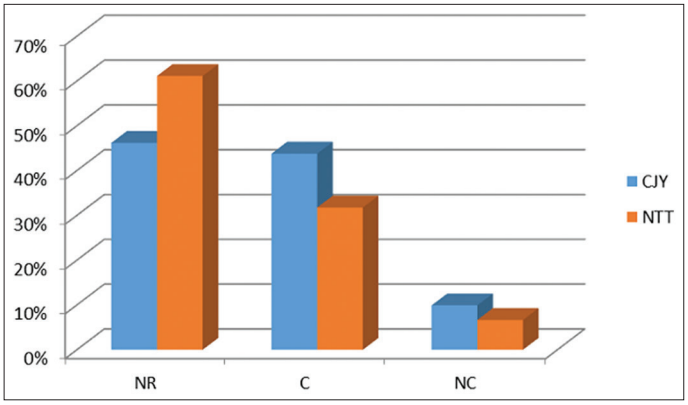
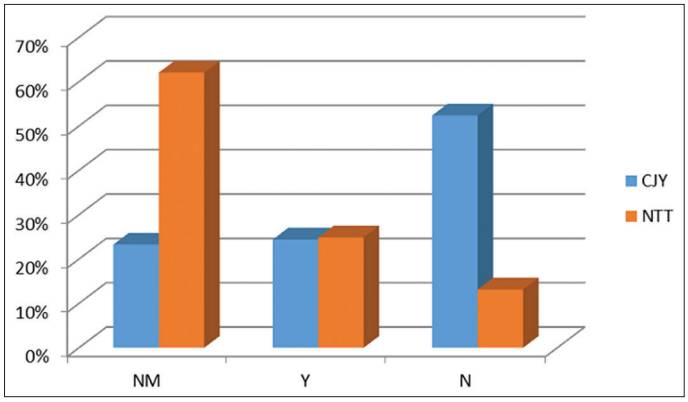


Figure 7: Participation of respondent in verification stage 3



in NTT which the majority respondent are farmers so that they can cook in the field.

Based upon the experiences in managing the whole M and V process and related to the target specified in this project, it seems that there are many interesting things to note. In M and V team point of view, the most challenging is changing and developing the guidance of M and V tools and process, in the name of pilot program. Without neglecting the implementation of the pilot program, all aspects were evaluated and criticized along with stakeholders and (if needed) it could be changed. This has an impact on changing of Operation Manual of M and V for several times. However generally the implementation of M and V process was in accordance with a period of time table specified in this pilot project.

It can be noted that time constraints at the end of the project period, forcing the M and V team to carry out their duties by ignoring the specified time period, especially at the third stage verification. This occurs because of the flexibility given to the MA to hand over more sales reports/exceed the specified time limit. Another thing that must be ignored at the end of the project, especially in NTT province, was sampling process for third verification phase. Considering the limited time, bad weather condition, and limited human resources owned by M and V partners at NTT, then the verification only prioritized/selected for the stove sold in the city/county around Kupang.

In conducting M and V process in NTT, the key success was getting support from local organization (in this case AOF) and

developing effective communication. M and V team is fortunate to have experienced local partner in conducting survey so that communication constrains because of different cultures can be resolved. AOF also have some field researchers and experienced. Support from AOF's management was also got although this project merely has limited budget. In addition one of the most challenging of M and V process in NTT was distribution of the stoves that extent to many districts of NTT. Initially, stipulated in the contract between the World Bank and LKY, the third stage verification in NTT will only be conducted in 2 districts and 2 islands. In fact the stove is distributed to many islands. One example is a stove sold by the Kopernik Foundation, spread over 3 islands, namely Timor Island, Sumba Island (West Sumba), and Lembata (LKY, 2017). Meanwhile AOF office was in Kupang city. Indeed, finally, budget determination was the main reason in conducting M and V process so that need to be adjusted.

4. CONCLUDING REMARKS

The dependency of the Indonesia CSI program to MA was so high. In the future, if this scheme will remain be used, tight selection towards the performance of MA is needed. However efforts to encourage the usage of biomass through using of clean stove must be continued because generally consumer agreed that these stoves are quite satisfactory and efficient in use (although some types of stoves were examined not easy to be operated or difficult to lit).

If the attempt to encourage the use of biomass through using of clean stoves will be developed in national level, consumer education program on using of clean stoves should be implemented first before the stoves thrown into the market. Raising of consumer awareness on using of clean stoves in their daily life is strongly important to be conducted. In other words, increasing consumer awareness relating to fossil energy crisis and the need for the development of renewable energy is absolutely required, so that when they choose to use clean stove, it should come from their awareness and knowledge that they have to participate and responsible in changing energy consumption pattern.

The development of renewable energy consumption pattern also requires involvement of potential parties such as local government, community leaders, NGOs, and universities. Various scheme should be developed to encouraging and spreading the use of clean stoves. Besides RBF system that focusing to the performance of MA, this program could also be applied by different approach such as by providing subsidy for clean stove's users. This subsidy is not necessarily a discount of stove price but also availability of fuel and spare parts of stove. However, the increased awareness of consumers for healthy cooking should also be supported with concrete facilitation such as financing, capacity building, and access to other household interest.

REFERENCES

ESMAP. (2013), RBF in the Energy Sector-An Analytical Guide, Technical Report 004/13. Washington, D.C.: The World Bank Group.

Indonesia CSI. (2015), Operation Manual for Monitor and Verification of Results Based Financing Subsidy-Indonesia Clean Stove Initiative Pilot Program. [Last accessed on 2015 Jul 10].

Indonesia CSI. (2016), Operation Manual for Monitor and Verification of Results Based Financing Subsidy-Indonesia Clean Stove Initiative Pilot Program, Addition of NTT, Sampling and Methodology Changes to Include Lessons Learnt. Last accessed on 2016 Apr 29].

Indonesian Ministry of Energy and Mineral Resources. (2003), Policy on Renewable Energy Development and Energy Conservation. Jakarta: Development of Energy to Support Green Industry.

Kleden, H.Y., Purwani, D.P, editors. (2016), Thinning Out the Smoke. Tempo Weekly Magazine.

LKY. (2016), Third Stage Verification Report of the 1st Sales Report of CV. Agro Java Dwipa (AJD) December.

LKY. (2017), Third Stage Verification Report of the 10rd Sales Report of PT. Ditana Energy Solution (DES) March.

LKY. (2017), Third Stage Verification Report of the 3rd Sales Report of CV. Agro Jawa Dwipa (AJD) February.

LKY. (2017), Third Stage Verification Report of the 3rd Sales Report of Kopernik Foundation (KOP) March.

Radulescu, D.M., Violeta, R. (2011), Educating the consumer about his right to a healthy environment. Procedia Social and Behavioral Sciences, 15, 466-470.

Scarlat, N., Motolaa, V., Dallemand, J.F., Monforti-Ferrario, F., Mofor, L. (2015), Evaluation of energy potential of municipal solid waste from African Urban areas. Renewable and Sustainable Energy Reviews, 50, 1269-1286.

Smart Village. (2015), Sustainable Dissemination of Improved Cookstoves: Lessons from Southeast Asia. Workshop Report 13, Yangon, Myanmar.

Voravate, T. (2014), Operation Manual for Monitor and Verification of Results-Based Financing Subsidy- Indonesia Clean Stove Initiative Pilot Program, 4 October.

Wira, D. (2016), Draft of Roadmap Initiative of Healthy and Energy-Saving Stove Indonesia.

Yabei, Z., Norma, A. (2015), Results-based financing to promote clean stoves: Initial lessons from pilots in China and Indonesia. Live Wire – A Knowledge Note Series for the Energy and Extractives Global Practices, 97845, 46.

YDD. (2017), Survey Analysis Result Study in Yogyakarta Report.

Yohanes, I.B. (2014), Terms of Reference Monitoring and Verification of Result Based Financing Subsidy-Indonesia Clean Stove Initiative Pilot Program, GERES.