ANNEX 2

Focus Research Hypotheses

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Some of the analysis has already been provided in the Focus Research. This part discusses the 5 key hypotheses of the focus research and KIPRAH's response.

Hypothesis 1: SOLID WASTE IN LOW INCOME URBAN AREAS CAN BE MANAGED IN A DECENTRALIZED WAY IN INDONESIA

Based on the functional pilot implementations conducted in 4 locations: Talaga Bestari-Tangerang (2006), Ubung-Denpasar (2006), Janti-Sidoarjo (2007) and Karang Rejo- Tarakan (2007), it is proven that waste management in low-income urban areas can be done using a decentralized approach. Three KIPRAH system are fully functioning in Ubung-Denpasar, Karang Rejo-Tarakan and Janti-Sidoarjo and are managed by community based organizations (CBOs), while one KIPRAH system in Telaga Bestari-Tangerang is managed by BEST for a certain period of time.

The 3 KIPRAH units which have just started delivering their services - Blitar (2008), Sambung Jawa-Makassar (2008), and Pecatu-Badung (2008) - prove that a decentralized approach for waste management in low-income urban areas is an appropriate method and can be a seen as sustainable approach.

The four KIPRAH units which have already started functioning demonstrated a different scope of service coverage in a variety of community social conditions. KIPRAH in Talaga Bestari, Tangerang served 1,034 households in a low-cost housing complex with a total waste managed of 20.3 m3/day. In Talaga Bestari most of the inhabitants live in their own small houses or rent annually. The houses are a typical size of approximately 45-60 m2 with structured lanes and paved roads. Social cohesion in Talaga Bestari is typical of a metropolitan social environment. It is not strongly bound, especially between the inhabitants living in the housing complex and their neighbors, since most of them are visitors. The local resident of Tangerang applied an informal enforcement method where an already existing small-scale, local 'mafia-like' structure (premanisme) was transformed into a constructive community management system.

KIPRAH in Janti, Sidoarjo served about 800 households in a community cluster combination of low-cost housing complexes and urban densely populated settlements, with waste volumes managed by the operator of approximately 13.4m3/day. The biggest clusters are the urban densely populated areas, which are unstructured clusters. People there live in rental houses for years and some of them already own or have purchased the houses. The lanes in the community are mostly dirt roads and only some parts of the areas have paved roads. Most of the inhabitants are Javanese from other cities but who already live there for more than 10 years. Some of them work as scavengers or factory labors and earn daily wages. Their social cohesion is strong, especially for community efforts. Janti village is also located

near industrial areas of which some accept any kind of waste for recycling purposes. Waste residues which are considered valueless in other places, are still valuable in Sidoarjo.

Meanwhile, KIPRAH Ubung, Denpasar served about 300 households in the first stage and aimed to increase the service coverage to 1200 households by the end of the 3rd year, with waste volumes of approximately 5.9 m3/day (first stage) and 20 m3/day (final stage).

Picture-02: Structured settlement in Talaga Bestari, Tangerang

The settlement in Ubung is also considered as an urban, unstructured, traditional settlement. People who live there are migrants from other parts of Bali and from Java. Most of them have already settled there for more than 10 years but live in monthly or annually rented rooms or houses.

Its social cohesion differs from that of Sidoarjo, as this city has two different classifications for inhabitants: they are either classified as local residents (Balinese, with ID card of Denpasar City) or as visitors or non-permanent residents. The Ubung village applies different monthly charges, and sometimes also different social treatment, for local residents and visitors/non-locals. Most of the visitors work at the bus terminal, as low-skill laborers or as street sellers.

The information above shows that the clustering of the coverage service area differs from one place to another due to the different characteristics of the communities. But the approach applied in this research is a cluster or area approach so that the system can reach its economy of scale within the framework of the cost recovery system based on the existing local social conditions.

CAPACITY BUILDING MEASURES/BOTTOM UP:

After several trainings, briefings and support, CBO and KIPRAH operators have proven that they possess the adequate capacity to run and manage the decentralized community-based solid waste management projects. By the time the report was submitted, at least 9 KIPRAH Community-Based Organization/CBOs, or locally known as KSM/Kelompok Swadaya Masyarakat, were already established.Each CBO consisted at least of a Chair, a Secretary, aTreasurer plus 17 local operators in Tangerang (5 workers), Denpasar (5 workers), Sidoarjo (7 workers), who have been trained to manage the MRF (Material Recovery Facility) in a proper way: starting from waste collection at the household level according to the agreed schedule,followed by separating and composting the organic waste at the MRF, delivering the residue to the landfill, documenting waste-in and waste separation, maintaining the MRF equipment, bailing the an-organic wastes and summarizing the records on a daily and weekly basis according to the Standard Operational Procedure provided.

Hypothesis 2: A DECENTRALIZED SOLID WASTE MANAGEMENT IN LOW INCOME URBAN AREAS IN INDONESIA CAN BE OPERATED ON A COST-RECOVERY BASIS MOVE TO OVERALL ASSESSMENT

Based on the properly documented and transparent financial reports submitted by the CBOs, it can be seen that of the three functioning KIPRAH units the operational costs of the KIPRAH system, including the MRF operations, have been fully covered by the operations' incomes. Main incomes are gained from the monthly fees paid by the beneficiaries and from recyclables sales. The KIPRAH Talaga Bestari, Tangerang, which is managed by BEST and employs 5 workers,still does not fully cover its expenses. Until August 2008 the total deficit amounted to approximately Rp.866,000 at an average monthly fee of Rp.7,000/HH/month. The operational costs at KIPRAH Janti, Sidoarjo, East Java, which employs 7 workers, are also already covered by the monthly fee of Rp 5,000/HH/month and by the sales of recyclables, which adds up to approximately Rp.200,000/week or about Rp 800,000 – Rp 1,000,000/month. In KIPRAH Ubung, Denpasar, Bali, which employs 4 workers and serves about 300 HHs a surplus is gained at an average of approximately Rp 250,000/month from the total income of Rp 4,000,000 and the operational cost or approximately Rp.3,750,000/month.

Picture-03: Waste separation done by MRF workers

In order to allow transparent and efficient accounting and cost analysis of MRF operation, a local consultant was hired to develop in a participatory way an accounting and cost controlling system which is later operated by the community and backstopped by the project. The system has been introduced to all MRF units and continued coaching is conducted for the operators.

For the time being, as can be seen from the descriptions of the three locations mentioned above, it is proven that a community-based solid waste management system, if managed properly, can reach cost recovery condition. Furthermore, as a positive impact , the communities gain more confidence that they have the capacity to manage and solve their waste problems while also receiving profits, even if not yet as a business unit.

To determine the monthly fee for the waste management services is another challenge as so far no standard or benchmark exists. The monthly fee in KIPRAH Talaga Bestari, Tangerang is Rp7,000/HH/month, in KIPRAH Janti, Sidoarjo Rp 5,000/HH/month, and in KIPRAH Ubung Denpasar Rp 5,000/HH/month. However, the amount of the monthly fee is not a factor by which to compare whether a system is more expensive in one location or another. The unit cost is largely influenced by the standard of minimum wages in every region or the Minimum Regional Wage/*Upah Minimum Regional* (UMR).The UMR of Tangerang Regency is Rp 750,000/month, in Sidoarjo the UMR is Rp500,000/month, and in Denpasar City the UMR is Rp 650,000/month. The major operational expenses are workers' salaries. In every KIPRAH system, workers' salaries dominate approximately 48-59% of the operational expenses, the rest of the expenses are made up of fuel, electricity and maintenance costs.

Table-02. Operational cost comparison in KIPRAH units

EXPENSES	TALAGA BESTARI TANGERANG	UBUNG DENPASAR	JANTI SIDOARJO
Cost for transporting residues to landfill	28,26%	5,58%	5,43%
Amenities/ equipments	0,55%	1,88%	16,35%
Electricity & water	0,56%	2,74%	0,00%
Fuel	7,88%	15,92%	6,10%
Salary	54,24%	61,33%	47,97%
Equipment maintenance	3,63%	1,97%	7,47%
Vehicle maintenance	1,46%	10,58%	0,00%
Security	2,78%	0,00%	11,19%
Equipments' depreciation	0,00%	0,00%	0,00%
Vehicles' depreciation	0,00%	0,00%	5,49%
Others	0,64%	0,00%	0,00%
Total	100,00%	100,00%	100,00%

Source: Compilation of financial reports 2008 from 3 pilot projects

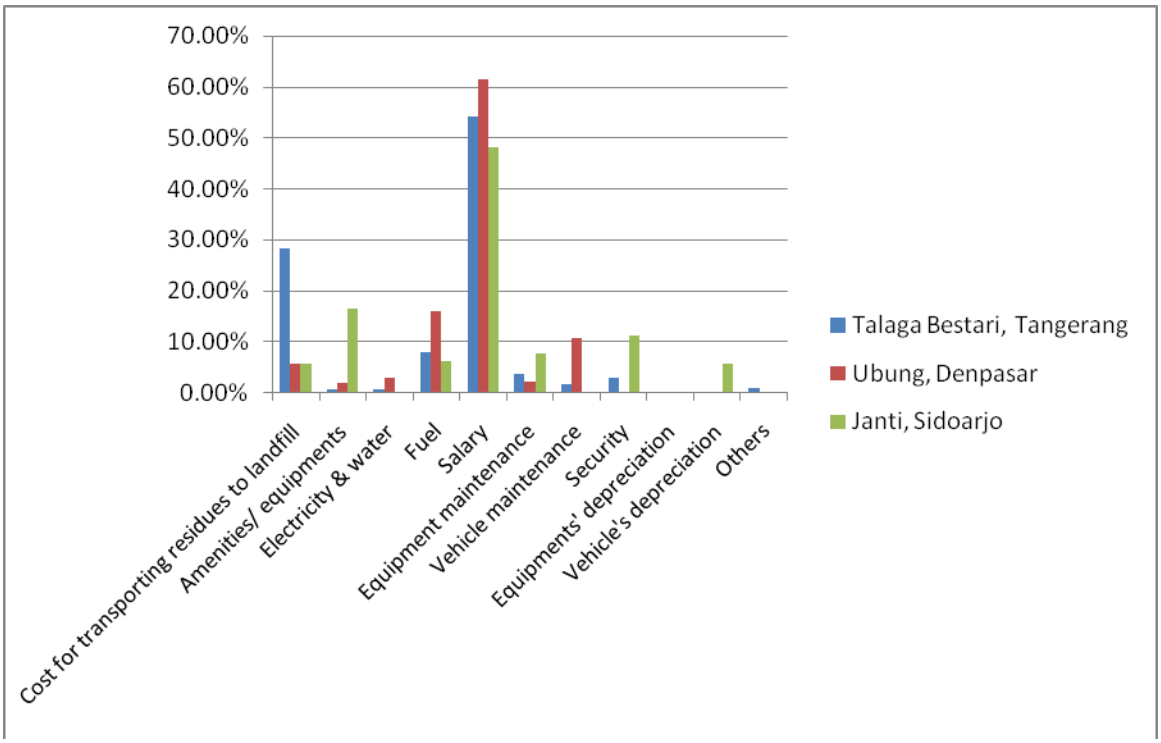


Fig.04 Operational expenses comparison in three KIPRAH systems

Other potential revenue is received from recyclables and compost. Although considered small, recyclables create a financial contribution to the KIPRAH Janti, Sidoarjo. The average revenue from recyclables is approximately Rp 200,000/week or approximately Rp 800,000 to Rp 1,000.000/month. If the management is optimized in the future, recyclables could provide an even higher contribution to the system's operation. With regards to compost, so far no significant or promising proof that compost is profitable exists, due to a question of the compost quality. There is a need to put more effort into promoting and researching a proper market for compost products, as well as introducing a composting method which can produce good quality, market acceptable compost. Up to now, compost is still not considered seriously as a potential revenue source of KIPRAH. A compost quality test from several samples in the 3 KIPRAH units is now being conducted.

If the other 4 KIPRAH units can show the same pattern of cost recovery, it can be assured that KIPRAH implementation in the low income urban areas of Indonesia can be managed under a cost recovery operational principle. Several CBOs have now started to consider formalizing and legalizing their collective efforts in order to become a business which has a strong social vision in the waste management sector. The profits gained will be redistributed to cover community activities and related projects.

Hypothesis 3: TRANSPORTATION COST TO THE FINAL DISPOSAL SITE AND SPACE FOR FINAL DISPOSAL SITES CAN BE REDUCED BY 60%

Based on the study conducted in the three KIPRAH units, the waste management system set up could reduce the transportation costs from the project sites to the landfill.

When the volume of waste sent to the landfill decreases and consists only of the residues, making up approximately 30-40%, the transportation cost as well as the required space at the landfill consequently also decrease accordingly. (This assumption is not taking into consideration the amount of uncollected waste before intervention).

This can be compared to the city-wide composting approach using the Takakura Home Method (THM) in Surabaya City in August 2008, which claimed that the reduction of waste sent to the landfill amounted to approximately 10% per year. If the KIPRAH-MRF approach is applied and the scale increased to a city-wide level, the transportation cost efficiency will be significant and the lifetime of the landfill could be prolonged.

Based on the baseline data from the pilot cities, the landfill's lifetime is designed for 25 years, however, due to the fact that the rate of waste generation increases as a direct result of population growth, and the conventional open dumping system is still practiced at the landfill (old paradigm), the landfill lifetime could be shortened. Considering the average service coverage of waste collection in every city is not yet optimized, with Tangerang at 19%, Sidoarjo at 33% and Denpasar at 70%, it can be concluded that approximately 30 - 80% of the waste is still uncollected and possibly being burned or dumped onto

unused land. KIPRAH can fill this gap and reduce the uncollected waste as well as reduce the amount of waste being burned or illegally dumped.

Hypothesis 4: THE EFFECT OF LIVING IN A HYGIENIC AND TIDY ENVIRONMENT LEADS PEOPLE TO BECOME MORE MOTIVATED TO IMPROVE CONDITIONS AROUND THEM. A CLEAN ENVIRONMENT LEADS TO LESS WASTE AND IMPROVES HYGIENIC BEHAVIOR IN GENERAL

To measure the behavioral change of the community, a Health Impact Assessment (HIA) is applied. HIA is a newly developed tool to analyze the impact of the KIPRAH program. Although it is named Health Impact Assessment, it does not merely measure the impact on health and hygiene aspects, but also socio-economical aspects of the target group. HIA measures the development of the community's condition after program intervention.

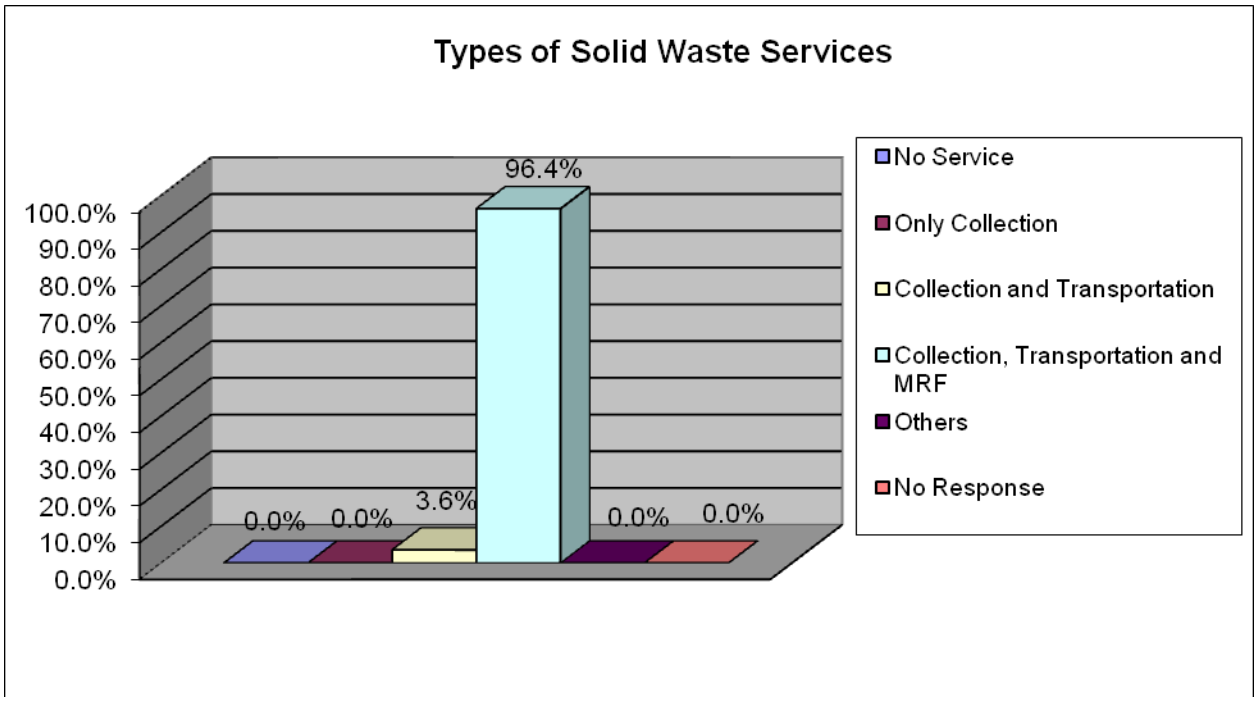
The implementation of KIPRAH has resulted in significant improvement of the community's health, hygiene and environmental cleanliness. This can be deduced from the result of the Health Impact Assessment (HIA) conducted in the target area after the program has run for 2 years. With several activities within the KIPRAH framework, the community is showing more awareness in managing its solid waste.

The HIA analysis shows that 92.2% of the total community disposes its solid waste into the waste bin. From the total percentage, 28.6% are already regularly separating the waste. This is one of KIPRAH's achievements in raising the awareness of the community through the given education and trainings. Furthermore, the KIPRAH system, i.e waste transportation to the dumpsite and treatment at the MRF level, continues the good work at the household level and thus creates a clean and healthy environment for the community. Consequently, there is no more waste scattered in the fields and in the streets.

The clean environment, both in the house and neighborhood, prevents pests, such as flies and rats, from entering. 28.6% of the community admitted that there are no flies and rats in their houses and surroundings (including sewerage). This condition has created a healthy environment, a fact which can be deduced from the 53.6% of the community mentioned that has had no solid waste-related diseases during the last year and the minority of 3.6% of the community who still has diarrhea. Furthermore, the personal hygienic behavior of the target group is improving. 92.9% of the community is practicing hand washing with soap after they handle waste and before having a meal.

Therefore, it can be concluded that KIPRAH has been proven in improving the wellbeing of the target group. Besides providing the solid waste management facility, KIPRAH is raising the community's awareness on personal and communal health and hygiene conditions as well as cleanliness of their surroundings.

Below is the example of the analyzed HIA data.



Hypothesis 5: PUBLIC PERCEPTION ON COSTLY AND PROJECT ORIENTED SOLID WASTE MANAGEMENT CONCEPTS CAN BE CHANGED TOWARDS SUSTAINABLE, DECENTRALIZED AND ENVIRONMENTALLY SOUND APPROACHES

KIPRAH provides valuable lessons learned for several parties, especially the research team, donors and governments. The functioning KIPRAH always have a number of visitors every week as shown in their guest books. Several consultants have made copies of the KIPRAH infrastructure systems without considering the management aspects, which leads to the failure of their projects. They are more concerned with the physical structures of the MRF as opposed to the total and comprehensive approach of KIPRAH.

Eventually, several LGs started to prove that community-based waste management can be sustainable, environmentally and socially accepted and economically viable, especially with the operational cost-recovery approach. The KIPRAH pilot demonstrations in 7 locations have provided the evidence for this conclusion.