

I. TITLE : THE INTEGRATED SOLID WASTE MANAGEMENT PROGRAM OF TERESA, RIZAL.

II. SUMMARY::

Eleven years ago, the Municipality of Teresa bore a little difference from any other town or city in the country in the way it managed its solid waste. Like most municipalities throughout the Philippines, Teresa had difficulty implementing Republic Act No. 9003 (or the Ecological Solid Waste Management Act of 2000) due to weak political will and ineffectual enforcement on the part of the local government. Negligent officials were not being held accountable by the public because Teresa residents' awareness of proper solid waste management was virtually nonexistent. Households and business establishments did not segregate their waste or practice backyard composting. Garbage would pile up in the streets uncollected, and open burning was rampant. Although the law mandated the phasing out of all controlled and open dump facilities by February 2006, the municipal government was still operating a dumpsite in Barangay Dalig, and all nine (9) barangays lacked their own materials recovery facilities or MRFs.

In 2004, the Municipal Government of Teresa was determined to address this growing problem of solid waste management. Mayor Rodel N. Dela Cruz, a former Vice-Mayor and Barangay Captain who was then serving his first term as Municipal Mayor, took the initiative to institute changes in the way the town administration and the community managed their solid waste. Mayor Dela Cruz recognized that real change could only begin from within the community, as modeled by its own leaders. More than simply implementing the law, a radical shift in perception, values and behavior was necessary in order for Teresa to realize its vision of becoming *"a progressive, peaceful, ecologically balanced community... is working towards sustainable agricultural and industrial development."*

To achieve this, a strategy was needed, starting with a legal framework that would set things in motion. Under the leadership of Mayor DelaCruz and the Sangguniang Bayan, Administrative

Order 07-2004 was passed creating a multi-sectoral Municipal Solid Waste Management Board (MSWMB) that would oversee all solid waste management (SWM) policies and programs in Teresa. In January 2006, the Sangguniang Bayan promulgated the *Municipal Ecological Solid Waste Management Ordinance of Teresa, Rizal*, which now serves as the legal and administrative framework for the implementation of all SWM programs within the municipality.

Empowerment of the people of Teresa : active participation of its citizenry down to the barangay level, with multi-sectoral linkages with stakeholders... key to the continued success of the Program



After the strategy came the plan. Chaired by the Mayor and assisted by the Municipal Environment and Natural Resources Officer (MENRO), the MSWMB then set to hammer out a comprehensive solid waste management plan (SWMP) also known as the *Ten (10) Year Municipal Solid Waste Management Plan of Teresa*, which is anchored on the following national laws: PD 825 (1975), RA 9003 (2000), and the Local Government Code of 1991. Key personnel were sent to study successful SWM models within the country and abroad for exposure and training. Teresa was the first municipality in Rizal to have this kind of Ten-Year Plan.

The hallmarks of the SWMP are: (a) continuous public awareness campaigns; (b) enforcement of a “no segregation, no collection” policy; and (c) the operationalization of MRFs in each of the nine (9) barangays and a municipal MRF called the Integrated Solid Waste Management Facility (ISWMP). Recovery and resale of recyclable waste and composting of biodegradable waste are done in the barangay MRFs, while the ISWMP handles further composting, residual waste processing, and the manufacture of concrete products and paper charcoal and other products derived from waste.

Now in its eleven year of implementation, the Teresa SWMP stipulates the systematic collection, segregation, processing, transfer and storage of solid waste, in a manner that protects public health and minimizes impacts on the environment. Waste diversion increased alongside waste reduction. Alternative livelihood programs were created, former waste pickers and residents near the ISWMP benefited from the program. Different organizations, communities and government agencies visited the municipality to learn the solid waste management practices. Numerous awards and recognition were given to the municipality to honor its commitment towards the implementation of sustainable solid waste management program.

Currently, an Environmental Program called “Best Performance in Solid Waste Management” is held every year to encourage the Barangays and Schools to continuously support and comply with R.A. 9003.

III. PROJECT DESCRIPTION

In 2005, the Teresa government commissioned a waste analysis and characterization study (WACS) to provide baseline data before the SWMP went full-scale. The average daily waste output of 9 barangays, 3 subdivisions and the public market/commercial area was found to total 17.09 cubic meters in volume, or 5.697 metric tons by weight. Of the waste profile, biodegradable waste amounted to 1.139 mT (or 20% by weight), recyclables amounted to 1.253 mT (or 22%), while residuals comprised the bulk of the total waste at 3.304 mT (or 58%). The waste diversion rate, or the percentage of total waste diverted from disposal at a dumpsite or landfill, was calculated at 22%, which was lower than the minimum 25% prescribed by RA 9003 for the first five years of implementation.

Two years into the SWMP, the municipal government commissioned another WACS to determine any significant decrease, if any, in the amount of waste generated by the Teresa community. The results from the July 2007 WACS showed a dramatic reduction from the 2005 figures: the average daily waste output was found to be 38% lower by volume (at 10.43 cubic meters), or 39% lower by weight (at 3.478 mT). Biodegradable waste was reduced by less than 48%, recyclables by 7.6%, and residual waste by 47.9%. The waste diversion rate was calculated to be 33%, which is higher than what is required by law. The waste generation figures indicated that the SWMP was being successfully implemented in Teresa through effective waste reduction and segregation at source. Moreover, door-to-door garbage collection decreased because of this, allowing the municipal government to cut back collection points and fuel expenses. Now on its eleventh year, waste diversion increase by as much as eighty percent (80%) and growing. It is estimated that by the year 2022, the Municipality will reach its target of zero waste management goal.

The Teresa-wide IEC campaign launched in 2005 was critical to the turnaround of the above performance indicators. The awareness level of the SWMP among school children and adults remains very high at ninety-five percent (95%). The awareness was attributable to the sustainable IEC by the implementers schedule every quarter of the year, aside from the continuous posting of tarpaulin materials in most of Teresa's conspicuous place all year round. Residents have learned to imbibe the SWMP system into their everyday life so that such terms as "nabubulok", "di-nabubulok", "nare-resiklo" and "compost" have become household words, and open dumping and open burning are now a rarity within the municipality. Barangays conduct tree



planting activities as well as the regular cleanup and maintenance of the national highway and inner streets. Rip rapping of erosion-prone areas has also been done at the site of the Teresa Integrated Solid Waste Management Facility (ISW MF) in Sitio Pantay, Barangay Dalig during its preparation.



Central to the SWMP is the ISW MF. The 2,000-sq.m. facility sits at the same site of the old Teresa dumpsite, which was ordered, closed in February 2006. With financial assistance from the Laguna Lake Development Authority (LLDA) through its LISCOP Project funded by the World Bank and the Royal Government of Netherlands, the ISW MF has grown from a makeshift structure into a well-stocked complex that houses a waste receiving area, a hazardous waste area, a mechanized composting area with an average monthly output of 8 tons, a livelihood processing center, where coconet is being produced, pillows/throw pillows production out of pulverized residual waste, paper charcoal production out of discarded papers and a processing center for residual waste where 400 kg/day of pulverized residual waste is used in making concrete products. There is also an office, a training/conference

the



center, a wellness center, and an organic garden and fishpond. There are about 35-40 part-time and full-time staff working at ISWMF.

The SWM program of Teresa, Rizal has earned numerous accolades since its implementation in 2005. Among these awards are plaques of recognition from the National Solid Waste Management Commission (NSWMC), the DENR-Region IV, the LLDA (“DangalngLawa” award for the protection and conservation of Laguna de Bay and its watershed), and the League of Municipalities of the Philippines (LMP). Two (2) barangays in Teresa were lauded by the Provincial Government of Rizal for their inclusion in the *Best Barangay Performer in Solid Waste Management Contest* in 2007. Teresa was also a finalist in the 2010 DENR Zero Basura Olympics. In 2013, the Municipality was included in the prestigious GalingPook Award. Two years in a row 2015, 2016,, the Municipality bagged the highest award, Platinum Award, of the Environmental Compliance Audit ECA, by the Department of Interior and Local Government , DILG, in CALABARSON area. Since 2006, the Teresa experience in successful solid waste management has been featured in several broadsheets, magazines and corporate publications, and also documented by media stations like ABS-CBN, GMA 7, QTV 11, NBN, UNTV, Reuters TV, AP/CNN and the Asian News Channel.



But no better impact can be found than in the words of one longtime resident, when asked to compare his past and present experience in Teresa: “Ibangibanangayon. Mas malinisnaang Teresa at masdisiplinadoangmgatao.”

IV. IMPLEMENTATION PROCEDURES

The SWMP would not have made any headway without the full engagement and ownership of the nine (9) barangays, each led by its Punong Barangay as the chief enforcer of the Program on the community level. Barangay Solid Waste Management Boards (BSWMB) were convened and, guided by the framework of the SWMP, were given the latitude to develop their own strategy on waste collection, segregation, recycling and sales, composting, gardening and beautification of their MRF and community.

BEST PERFORMANCE IN SOLID WASTE MANAGEMENT PROGRAM WEEKLY RANKING

In the spirit of mutual accountability, the MENRO started conducting weekly monitoring of barangays and schools in their solid waste management performance. The monitoring criteria developed by the Municipal Solid Waste Management Board (MSWMB) are as follows: segregation (40%), composting (30%), recycling (10%), cleanliness (10%), and unity in purpose (10%). Weekly rankings are posted in the town plaza opposite the Parish Church, which also

announces the results during Sunday Mass. The top-ranking barangays and schools are announced every December, with plaques and cash prizes given to winners. This weekly monitoring scheme has proven to be effective in keeping the public constantly aware and vigilant about proper solid waste management as it is being practiced in the various communities within Teresa. It also encourages the “bayanihan” spirit – or spirit of mutual cooperation for the common good – among the residents, while at the same time it keeps morale high by giving recognition and incentives to deserving barangays and schools.

To address the root problem of poor public education and awareness, the Municipal Environment and Natural Resources Office (MENRO) spearheaded a massive information, education and communication (IEC) campaign to launch the SWMP in 2005. The MENRO Officer conducted training and capacity building workshops in each barangay in order to cement the local leaders’ understanding of RA 9003 and their responsibilities under the SWMP. This learning was then cascaded down to the grassroots level as the Sangguniang Barangays organized teach-in sessions for their own constituents. The MENRO also conceptualized and produced the IEC materials for distribution in a door-to-door drive that reached almost 8,000 households throughout the municipality, with each household visit capped by a pledge of commitment from the residents. Slogans and reminders were also posted in public places to remind the constituents of the municipality’s seriousness in implementing the program.

IEC MATERIALS



Since the SWMP’s inception, the MENRO has called on key sectors – the schools, the Church, industry and private enterprise, and civic groups – to partner with the municipal and barangay governments in order to maximize the reach and impact of Program. One industry partner, FR Cement, pledged three hundred (300) tarpaulin posters every quarter as a commitment to the public awareness drive, while other companies like Teresa Marble Corporation and ABC Philippines donated waste bins and sacks to help jump-start the implementation of the SWMP. There are also productive partnerships with agencies outside Teresa. The municipal government conducts a quarterly river and waterway cleanup drive with the LLDA “Environment Army.” Another joint undertaking is a tree-planting drive with members of the PNP and community volunteers.

The women’s organizations have taken a very proactive role in mobilizing the citizenry. The Teresa Women’s Council, composed of the all-women Teresa Ladies Association and the Rural Improvement Club, together with three other predominantly female organizations (namely the Teresa Women’s Club, the Day Care Workers, and the Barangay Health Workers), and has been instrumental in the success of the public awareness campaigns. The Teresa Ladies Association (TLA) headed by the Mayor’s wife was tapped to produce household decor and other novelty items from cornhusk, which is considered residual waste. The association is also

at the forefront of a beautification/clean and green drive involving the various barangays. Women are well represented in the policy-making bodies, with at least one female member sitting on the MSWMB and each of the nine (9) BSWMBs. In some barangays, women are employed to sort the waste and tend the MRF eco-gardens.

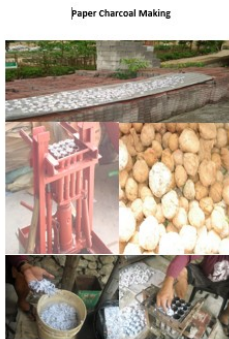
Clearly, the empowerment of the people of Teresa through the active participation of its citizenry down to the barangay level, together with multi-sectoral linkages with stakeholders, is the key to the continued success of the Program.

V. PROJECT RESULTS/IMPACTS

If one wishes to find innovative practices in solid waste management in Teresa, one need not look farther than the newly constructed Sta. Rosa de Lima Church in barangay Poblacion. The imposing structure proudly showcases paving blocks made from pulverized residual waste, all processed and manufactured at the Integrated Solid Waste Management Facility (ISWMF). Using equipment and machinery such as residual pulverizers, concrete mixers and CHB molding machines, which the municipal government purchased through the LISCOP loan-grant., The ISWMF daily converts residual waste (e.g. plastic bags and wrappers, doypacks, Styrofoam, textile, ball pens) into additives for the manufacture of non-load bearing concrete materials such as hollow blocks, floor slabs, bricks and paving tiles.



To ensure that the quality of these products would not be compromised by the residual additives, a DPWH-accredited testing company was called in to certify the compressive strength of the concrete products in compliance with the Bureau of Product Standards under the Department of Trade and Industry (DTI). The venture has proven to be a profitable one, as the ISWMF is continuously producing concrete products in response to local market demand. These products have been used to pave not only the Sta. Rosa de Lima church, but also the town hall, subdivisions, and business establishments within Teresa. Outside Teresa, bulk orders are coming in from nearby LGUs and provinces. In 2007 Teresa was contracted to supply paving blocks for the Pasig River rehabilitation project.



Paper Charcoal Making

Also located within the ISWMF is a paper charcoal manufacturing area. Made from recycled paper and cardboard, the charcoal products used to be molded by hand until MENRO Officer Marlon F. Pielago, MPA, a mechanical engineer by training, invented and assembled a compressing machine that standardizes the size, shape and weight of the paper charcoal as well as significantly increases the output per molding. Sold to Teresa residents at a lower price than the market price of regular charcoal, the paper charcoal can last for up to three (3) uses before it may be discarded.

A coconet production area was also inside the Facility. Coconet came from coco fiber derived from buko husk waste. It is grounded by decorticator machine, where the meat and the fiber

separated. The fiber is then sorted out and a rope is produced by twinning method. After the rope is twinned, it is then weaved to produce a coconet. The end product (coconet) is normally used in the soil erosion prone area before planted by trees, in rip rapping, and also in the construction of roads. All the workers in this area were former waste pickers who lost their income with the success of the municipality's SWMP.



Another significant innovation can be found in the unique relationship between the Teresa municipal government and the two cement companies in its vicinity. Although agriculture is traditionally the primary source of livelihood in Teresa, the town's physical configuration – central farmlands surrounded by mountains rich in non-metallic mineral deposits such as marble and limestone – has made it host to various extractive and manufacturing industries. In late 2010 FR Cement (Republic-Lafarge), a major manufacturing firm in Teresa, signed a Memorandum of Agreement with the municipal government to purchase pulverized residual waste which would then be co-processed in the plant as alternative fuel and raw material (AFR) in cement production. Also known as refuse-derived fuel or RDF technology, the co-processing of AFR is environmentally sound, as it contributes to climate change mitigation by essentially converting municipal solid waste into fuel or green energy, and by effectively reducing the volume of waste ending up in landfill areas.

Teresa officials are seeking to make this partnership with the cement plants more sustainable by increasing the scale of their residual waste processing. Such a strategic partnership should prove immensely beneficial to Teresa, which will be able to reach zero waste, and the cement companies, which will be able to cut fuel costs.

All these examples show that the Municipal Government of Teresa, through its MENRO Office as the main SWMP implementer, is constantly on the lookout for innovative ways to improve its existing solid waste management mechanisms, adapt to the changing economic and environmental conditions, and find creative, practical and lucrative uses for the solid waste it generates.

Seven years after its inception, the Teresa SWMP is still going strong. Several reasons account for the transferability and sustainability of the program.

First of all, it was the integrity of the planning process that guaranteed the viability of the SWMP and made its legal and administrative framework solid enough to transcend personalities and withstand the shifting political landscape. The planners understood that a long-term, well-thought-out, systematic, and flexible strategy involving all sectors of Teresa was necessary to help Teresa achieve its goals. The plan included sound policy mechanisms, such as the creation of the MSWMB, to guide the implementation on the ground. The program was also firmly grounded in national law, while municipal ordinances gave the law teeth at the barangay level. Such planning could not have come about without good governance.

Secondly, the SWMP has instituted an efficient and effective system designed to promote sustainability, profitability, and replicability. Best practices are safeguarded. The system requires a key element for its success, which is informed and active citizen participation and cooperation. As a result, implementation has run smoothly. Collection schedules are posted in neighborhoods and the “no segregation, no collection” policy is strictly enforced. Residents now segregate and practice backyard composting. They augment their income by selling recyclables and leftover food as livestock feed, while the barangays earn from the recyclables and from vegetables grown using compost from their own MRFs. Revenues go back to the barangays for the upkeep and maintenance of the MRFs. MRF Eco Boys receive a monthly allowance of PhP 1,500, but earn additional income from selling recyclables. Each component of the system works harmoniously, and the residents appreciate the logic and simplicity of it all.

Thirdly, the Ten-Year SWMP was designed for long-term socio-economic gains. The financial challenges initially encountered by the Teresa municipal government were overcome by the resourcefulness in securing funding from agencies that were willing to invest in the Teresa vision. And the rewards cannot be gainsaid: the ISWMP alone has grossed PhP 677, 743.75 over the last three (3) years (2006-2009) of its commercial operations, or an average of PhP 169, 436.00 per year. This income is derived from the combined sales of concrete products using residual mix, the organic fertilizer (which is being sold to Teresa residents as well as to agribusiness associations such as the Federation of Rizal Farmers), and, to a lesser scale, the recycled paper charcoal. The Teresa municipal government understands that financial viability is crucial to economic sustainability.



Fourthly, the SWMP is flexible enough to encourage expansion and innovation. In 2012, construction of Teresa Learning Center with Eco-Park started and by July of 2013, it was inaugurated by GM Neric Acosta of LLDA. The Eco Park house the training center, an eco-park and camping grounds, a wastewater treatment facility and wetland park, a mini forest, orchidarium, butterfly farm, nursery, a crocodile watch area, and a *Pangasius* (Cream Dory) aquaculture project. The municipal government was granted another tranche of loan-grant of the Program by World Bank, through LLDA.

Lastly, beyond the policies, system, and funding that went into the SWMP, it took vision, passion, dedication, and consistency on the part of both the officials and citizens to initiate and sustain the transformation of Teresa. By walking the talk, the Mayor then, Rodelda Cruz, and the present Mayor Hon. Raul S. Palino, inspired the municipal and barangay leaders to discharge their responsibilities under the SWMP. This same ethic as modeled by the Mayor and local officials has in turn motivated the people to work side by side with the municipal government and take full ownership of the Program.

The success story that is the Teresa, Rizal solid waste management program demonstrates how strong political will and leadership by example, coupled with a sound strategy backed by a

competent technical team acting as the focal implementing arm, and supported by the local citizenry, civic groups and industry/business partners, can create positive changes in the attitudes, values, behavior and practices of its residents, and help turn a town around towards lasting social transformation.

People's Participation & Empowerment



"Waste is a resource in the wrong place at the wrong time. Once it finds its rightful place, it will be just as valuable as any other resources."

Mother Earth... Our Responsibility!!!