MANAGING GOA’S WASTE

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Goa, home to India’s happiest citizens and the dream destination of tourists, is drowning in waste. This need not be so if Goa learns lessons from best practices elsewhere in India, especially two great examples in Andhra Pradesh and one in Kochi. But strong administrative will is a necessary first condition.

In 2004, the town of Suryapet , three hours east of Hyderabad, became India’s first dustbin-free and dumping-free city in India. Its Commissioner, S. A. Khadar Saheb, achieved this in 18 months without any financial help from Centre or State, no local NGO support and no external waste-processing or landfill site. Simply by an intensive drive to collect and transport dry waste separately, he could manage the waste of his 103,000 residents on a half-acre of inner-city land. In addition, he earned the city Rs 40,000 a month through sale of compost, and Rs 55,000 a month from sale of sorted dry recyclables.

How did he achieve this miracle entirely with local resources? He recruited eight self-help groups for door-to door collection in tractors. These new trqactors were bought with bank loans, and repayment guaranteed by the city through deductions from the rental paid for the SHG’s collection services. After five years, the tractors are fully owned by them. The tractors stop at every 5-7 houses along a street, and residents come up to it with their kitchen waste. Dry waste should ideally be collected only once a week, as retaining it separately is nuisance-free.

This food waste is unloaded at the half-acre site for stack composting. On a low platform of criss-cross bamboo or casuarina poles supported on hollow blocks, food waste is piled in 10’ x 10’ x 8’ high heaps and each layer treated with dilute cowdung solution as the stack is formed. Undisturbed, without need for turning, this becomes compost in about 4 months. There is natural air circulation within the stacks as hot air goes out the top, drawing in cold air from below the porous wooden base. To speed up matters, after 2-3 weeks this partly-stabilised waste is fed to earthworm beds for vermicomposting.

Suryapet built a large shed with partitions along the walls for storing different grades of dry waste: rigid and thin platic, paper, rubber, metals, wood. Sorting was done by employing eight traditional waste-pickers fulltime for foot-baling and stacking of different grades of waste. Scrap dealers and kabadiwalas eagerly picked up this ready-to-transport dry waste to different recycling-factory customers.

Inert waste consisting of debris, construction and demolition (C & D) waste, road dust and drain silt was cleared in the afternoons. Stretches of drain were allotted per person, to empty drain silt directly into wheely-bins pulled along their stretch and unloaded immediately into a separate municipal vehicle. No silt was allowed to remain on the ground alongside the drain, as coordination between the drain cleaners and the silt-collection service rarely happens.

Sand unloaded in front of construction sites invariably spills onto the carriageway, causing two-wheelers to skid or fall, and four-wheelers to scatter the sand into drains. This is easily prevented by a policy for sand containment and its strict enforcement . Sand is filled into empty sacks which are piled around the sand heap to confine it to the road shoulder without spilling onto the road. Onsite bricks can be similarly used for confining sand or small stone-metal heaps.

Mr B Janardhan Reddy, the Director Municipal Administration (CDMA) of AP has started a policy of holding his regional meetings only in the dumping ground of one town or another. Obviously, this triggers a cleanup drive at the selected dump. Shaikh Subhani, the Commissioner of Saluru, in the far NE corner of coastal Andhra, was so inspired by this that he pushed all his randomly-dumped waste into a perimeter bund for later treatment and sieving, converted the central area to a park, and celebrated his daughter’s wedding there, surely a global first!

Khadar Saheb, now Jt Director DMA, pulled off another miracle in Warangal last October, with full support from the CDMA and visible leadership from the young new Commissioner Vivek Yadav of Warangal, a town of 600,000. Together with four free-lance solid-waste-management (SWM) consultants, they dreamed up a way to make SWM compliance as exciting as an IPL 20-20 cricket match, through a Clean Cities Championship Campaign. The result: in just one week, this typical town of overflowing cement-ring waste-bins on roadsides became clean and bin-free, with 100% door-to-door collection of 80% fully-segregated waste in pushcarts. Dry waste collection was done at the doorstep itself, with spot-sorting into paper, plastics and combustibles. This minimized the waste dramatically as each stream went to a different unloading destination. All waste fractions were weighed everywhere that week, yielding perhaps the most comprehensive city-wide data on urban waste to date.

How was this one-week city transformation done, with just 20 days of pre-launch planning and publicity? [www.cleancitieschampionship.org](http://www.cleancitieschampionship.org) describes the awareness drive s, practical training, process and outcomes and uploads daily waste-collection data. Google street-maps of the city were used to divide the entire residential area into equal routes of 400 houses, each with competing teams of an S.I. (Sanitation Inspector), route-manager with pushcart and two sanitation staff to collect discards from homes and also clean their streets and drains. 373 such teams competed for individual cash awards, including 260 home teams from Warangal itself and the rest from 59 other regional towns supported by local workers. They were monitored by NCC volunteers for punctuality, collection efficiency, completeness of segregation and area cleanliness.

As door-to-door waste went into pushcarts, roadside ring bins became progressively empty and daily a few were removed. In 7 days, 266 ring bins and 48 dumper bins and 1200 open dump spots were removed and replaced by potted plants. A debris-clearance drive left all roads cleaner and wider. 106 tons of dry waste went to a large shed for sorting and auction, and some wet waste went for stack and vermi-composting. Thus 70% of waste was diverted from the disposal ground. Old waste lying there was formed into windrows for weekly turning. A unique new portable garbage segregation machine from JK Engineering Malegaon, fed with semi-dry old waste, instantly splits it into three clean fractions: dust-free thin-plastic fragments saleable at Rs 12 a kg, a clean fine organic fraction useful for city greening, and clean gravel/grit useful for improving internal roads there. Within a year, this machine may clear the entire site of old waste.

Besides three prizes of Rs 30,000 to 12,000 for best home teams and outside teams (Khammam was the winner), there were bicycle prizes through lucky draws for school kids with contest cards signed by the route managers for giving them segregated waste. 30 home-makers won Rs 100 each for best compliance. The CCC contest was funded by Rs 24 lakhs from the AP Pollution Control Board, probably their best investment ever, so they plan to fund similar contests in other AP cities. The CCC team, delighted with its success, has offered its services to any city that will pay for such a drive on a per-capita basis. Goa is such a small State that engaging this experienced team for a month of effort and a competition between local towns and villages can potentially clean up the entire State in just one week!

Meanwhile, Goa’s hotel industry can benefit from a visit to Kochi, where Meridian Hotel with 223 double rooms manages its entire wet waste and garden waste onsite in a large garden shed with 22 composting biobins of 40 kg capacity each. CREDAI has made 300 Kochi high-rises zero-waste just by 100% collection of unmixed wet waste by installing terrace bio-bins, thereby diverting 30 tons a day of waste from 30,000 households (150,000 persons, the size of a small town). This is spreading to many other Kerala towns. See [www.cleancity.in](http://www.cleancity.in) and a Youtube video of the same name.

Dry waste is also collected separately and recyclables are sold. Unwanted plastics (thermocole, multifilm sachets) are centrally shredded for use in “plastic roads” with 2-3 times better life than normal asphalt roads. One basin of shredded plastics is sprinkled onto heated stones and mixed for just 30 seconds before molten tar (bitumen) is added as udsual for normal mixing. This process can be used in both centralized hot-mix plants and mini-hotmix equipment. The Central Pollution Control Board has issued two downloadable Guidelines on this : PROBES/101/2005-06 describes how to use the plastic and PROBES/122/2008-09 compares the life of “plastic roads” with normal bitumen roads, based on studies of the 1200 km of such roads laid down in all districts of Tamil Nadu in 2004. Goa should make this compulsory State policy for all roads as Himachal Pradesh has done.

With rising diesel prices, a new low-temperature P2F (Plastics To Fuel) process is becoming so viable now that major scrap dealers have begun investing in such equipment. If an Amul milk-collection type model is adopted in Goa, with persons invited to bring in waste plastics for shredding and depolymerising and taking back some diesel-substitute fuel (or its cash equivalent) in return, the countryside can soon be free of windblown plastic litter.

A cap on subsidized gas cylinders is increasing the popularity of two other innovations of the CREDAI Clean City program at Kochi. Barrel-sized home biogas units can accept the food waste of one bungalow and give 2-4 hours of cooking gas daily. A similar biogas unit installed in a septic tank can also produce cooking gas while reducing the need for sludge removal.

All these measures are now necessary and will become a national norm because of the countrywide neglect and indiscriminate open dumping of mixed waste at suburban sites which were meant for stabilizing and composting of wet food wastes. Goa is already facing preventive protests by villagers asking towns to manage their waste within their own city limits. Villages around Trivandrum and Bangalore have recently closed down the open dumpsites of their urban neighbours by long-overdue protests against urban arrogance and willful pollution, leading to piles of waste in the streets. Bangalore has had to respond by a Notification requiring daily collection of only wet waste, refusal of mixed waste and once-weekly collection of dry waste at wardwise centres.

Another Notification requires bulk generators producing over 100 kg (one 200 litre barrel) of waste a day to compulsorily manage their own solid waste on-site, as is now mandatory for liquid waste in decentralized sewage treatment units. Both measures are necessary to comply with the key requirement of the Municipal Solid Waste Rules 2000 : MINIMISE WASTE TO LANDFILL.

Chhattisgarh has just resolved to become India’s first kerosene-lighting-free State by distributing portable solar LED lanterns to 13.5 lac tribal families and study lights to 16 lac students. By the very simple solution of collecting and transporting unmixed wet (food) wastes and dry (recyclable) wastes, every Goan can easily help their lovely little land to become India’s first landfill-free State if it is really serious about segregation and decentralized waste treatment.