Conducting Monitoring and Evaluation

One of the main reasons to undertake monitoring and evaluation is to understand how a service, scheme or communications campaign is performing so that you can identify opportunities for improvement. For example, quantifying the amount of garden and food organics currently collected in the residual waste bin and assessing this in terms of the season, alternate garden organics services and programs, and local commitment to recycling, will provide an understanding of the amount of organics likely to be collected by a new service.

Careful monitoring and evaluation of data collected from trials may provide useful information on which to base decisions when designing a new full service. For example: whether the communication material and methods are effective in encouraging participation and ensuring low contamination levels and whether investment in caddies and liners is necessary for all households.

There are fundamental differences between monitoring and evaluating a trial and the full implementation of a new service. Thousands rather than hundreds of houses will be receiving the new service, the service will be offered for numerous years rather than weeks or months, and the purpose of the evaluation is more likely to be for fine tuning a service rather than to evaluate the costs and benefits of delivering the service. This means that monitoring of a full scheme using the following indicators:

✓ Number of and nature of phone calls received on help line

✓ Gross tonnage of organics received at the processing facility

✓ Feedback from waste collection staff and organics processor on suburbs or collection routes regarding impressions of contamination and participation rates.

may be more appropriate than direct measurements such as:

✓ Door to door and focus group discussions with residents

✓ Household by household compositional audits of bins.

Following the initial role out period of a new service, customer service staff, and waste education and collection staff may not be as busy delivering material or responding to inquiries and issues. There may therefore be more resources available to do more detailed monitoring and evaluation of the new system such as visual inspection of individual bins to get a snapshot of participation rates and variation in contamination levels between households.

Both in the first few months of a new service and at least yearly, it is valuable for decision makers and householders to be made aware of the progress made; for example: x tonnes of organics diverted from landfill, generating x cubic metres of compost, x % of householders participating, and x % contamination. Celebrating householder efforts may encourage further participation, increased diversion and closer consideration of contamination.

Rewarding and recognising householders for doing the right thing with their organics recycling can motivate people to continue their positive behaviours and take further action. Rewards could include financial rewards, for example vouchers, donations to charities, cash or discounts on goods and services. Recognition could, for instance, include personalised feedback about how much a household has recycled, or a letter about how donating an item for reuse has helped the local community.

Choice of ongoing monitoring and evaluation methods will depend on the Key Performance Indicators (KPIs) chosen for the new service. During the planning stages, SMART objectives will have been set thus informing the type of monitoring that will be undertaken on an ongoing or periodic basis (see Factsheet 8).

The level of monitoring and evaluation will change throughout the life of the project. Initially monitoring and evaluation may be undertaken regularly until the KPI are consistently met. Monitoring may then become more periodic. Towards the end of a collection or processing contract monitoring may be again increased in order to inform the decisions about whether to inform, modify or discontinue the service.

Monitoring methods

There are various methods that can be employed to demonstrate the effectiveness of a scheme including:

Method	How?
1 Tonnage data analysis, for example increased tonnage of organics and decreased residual waste tonnage	Request data from facility operator
2 Waste auditing, per bin, or aggregated via a visual waste audit, or physical waste characterisation	Contract specialist company to undertake composition analysis
3 Set out and participation rate monitoring, for example identifying 80% of all organics bins are put out for collection but only 50% of them contain food organics	Identify area, conduct visual inspection on (3 consecutive) collections, record households who have placed bin(s) out for collection.
4 Organics capture analysis	As method 2, conduct a tailored waste audit
5 Stakeholder feedback	Conduct focus groups and / or surveys (door to door, roadshows, events, public places)
6 Communication evaluation	Compare baseline data and results of above methods in areas you targeted with your communications campaign

In the initial weeks of implementing a service it might be beneficial to use monitoring techniques that allow for rapid evaluation and response. Data from a compositional audit may take several weeks to analyse, whereas a visual assessment of the level and type of contamination in a truck load of waste deposited on the floor of a processing facility is instantaneous. The less accurate but instantaneous data can be fed into the contamination and risk management plans developed in the program planning stages, and corrective measures can be taken before incorrect recycling behaviours become entrenched.

When to Measure	How
1 Pre- campaign (identify a baseline)	Tonnage Data
2 During the campaign	Participation rates
	Set-out rates
3 Post Campaign	Capture rates
	Contamination rates

Sampling

Conducting monitoring often requires collection of data from a sub-set of the population of interest. Sampling is the process of identifying a sub-set that will mirror the population of interest. This will enable making reliable generalisations about the whole population. The steps in a sampling process are as follows:

✓ Define (profile) the population of interest – decide which factors are important. Use socio-demographics.

✓ Decide how to obtain a sample that is reflective of this profile.

✓ Decide how precise the results should be – the required sample size will depend on this. For participation monitoring and questionnaire surveys, 3% precision (with a 95% confidence interval) is sufficient which means a sample size of 1,100. Sample sizes smaller than 1,100 are viable but the results become less precise as the sample size gets smaller.

✓ Design the monitoring in a way which reduces bias.

✓ Conduct the monitoring and collect the data.

✓ Weight the data to match the target population.

Target population

Demographic profiling can be used to ensure that the sample is representative of the target population. Profiling is the process of describing the target population from which the sample will be drawn. How the target population is profiled will depend on which factors have been decided to be important to the study. Profiling provides useful insights about population and gives detailed socio-demographic information for categories such as age, gender, social grade, ethnicity, employment status, income levels, housing types and tenure. This information provides a good basis for defining key characteristics of the target population, which can be taken into account when selecting the sample. Property types and the urban/rural property mix will also be relevant when characterising the target population.

Representative sample

When undertaking detailed monitoring such as household compositional audits it is important to understand the principles of sample selection as it will be too costly to audit all households. Samples should be randomly selected from areas representative of the total population being analysed and be of sufficient number that variation between samples can be accurately measured. For example sampling only committed recyclers from larger households and with large gardens will result in higher organics figures in terms of kg/hh/wk, than single person households living in multiunit dwellings. Similarly with questionnaires and surveys, although these may be distributed to all households return rates will usually mean you have a sample only. Evaluation of the results needs to take into account whether the respondents are representative.

The sample must be made up of households or people with an overall profile (social/demographic) that matches the target population. This is called a representative sample. The results from observing or speaking to a sample of the target population can be generalised to that population provided the sample is representative.
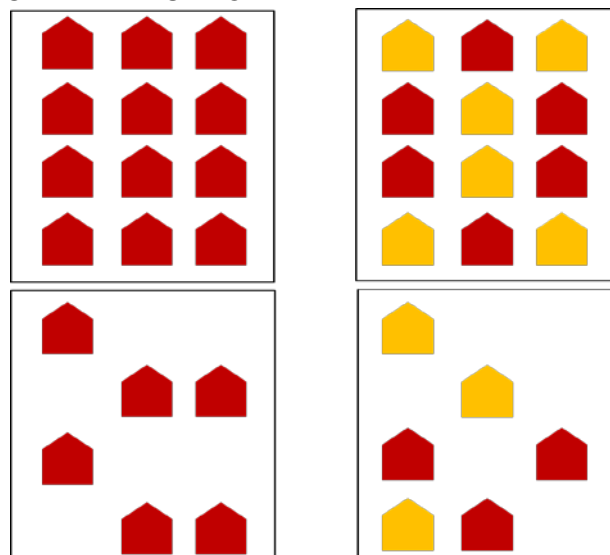
All households in the local authority, 50% red, 50% yellow and the representative sample, 50% red, 50% yellow

Sample size

The sample must be of a sufficient size in order to be confident the results obtained for the sample can be generalised to the target population.

If the sample chosen is not representative of the target population with respect to a key factor of relevance to the topic being monitored, there is risk of biasing the results.

For surveys where people can choose whether to participate or not, you will have to try to contact more people than the required final sample size. The expected response rate for the survey will indicate how many people you might need to contact. The response rate depends on the type of survey and how it is presented.

Evaluation

The information you collect during monitoring is only useful if you spend some time analysing it to understand what it is telling you. You will need to interpret the data by comparing it with other information such as previous data of the same type or findings from other areas.

Looking at changes over time

You should be looking to compare the monitoring data with the same type of data from any previous monitoring you've done to identify any patterns or trends such as increases or decreases in figures over time. The previous information, or baseline data as it is sometimes known, provides a useful benchmark against which to compare subsequent results. It is important to have baseline data if you want to measure impact (for example. before and during a pilot trial).

It is also important to understand the changing context when comparing data over time, as other factors can influence the data set. For example, changes in behaviour including increased waste avoidance can reduce the amount of material diverted.

Looking at differences between areas

As well as looking at differences over time, you may want to compare similar data across different areas that have different types of systems and/or different demographics.

Looking at different types of data together

In addition to comparing similar types of data to each other, you will also need to look across all the different types of data you have collected to see if they tell you anything useful about the underlying causes or factors that might be affecting performance. If, for instance, you have a scheme that is poorly performing on a particular round, you may want to look at different bits of data to understand why. It may be, for instance, that participation rates are generally quite high but that contamination is also high, resulting in rejection of containers by crews and therefore low capture. You can only establish this by looking at different sets of data for that round, such as participation rates, tonnage figures and capture rates.

Identify areas for improvement?

As well as identifying potential service changes to improve performance, by looking at the monitoring data you are also in a position to identify any useful lessons learned.

Having obtained and analysed the data, you should be in a position to identify potential areas for improvement. Consider, for example:

✓ Are there areas with particularly low tonnage figures?

✓ Do you have any areas with low participation rates, low capture rates or high levels of contamination?

✓ Is there a particular type of contamination affecting the service / scheme?

In addressing these types of questions about performance levels, you will need to spend some time identifying the issues that are affecting the service / scheme.

✓ Do households have everything they need to participate effectively (for example the right container, the right information, knowledge of collection days)?

✓ Are the collections happening effectively or are there service problems (for example missed collections, overflowing communal bins)?

✓ Are there extraneous factors that may be affecting performance (for example vandalism of storage sites, an increase in population following an influx of migrant workers)?

To answer some of these questions you need to look at sources of data such as surveys, complaints and feedback to call centres, and focus groups. You may find that you don't have enough information to form an opinion and need to do some more data gathering before you can draw any conclusions. Be sure to do so before pressing on to decide on potential improvements.

Case Study – Waverley and Randwick councils

Waverley and Randwick councils jointly implemented a home composting trial in 2009 called the 'Compost Revolution' involving 580 residents over 12 months. The trial involved providing the sample of residents in both single and multi-occupancy dwellings with a compost bin or worm farm (or access to a communal compost bin) and a 7.5 L kitchen caddy to use in the kitchen. The compost revolution 'brand' was developed along with a series of training workshops, group events and educational resources.

The key objectives of the project were to:

✓ Trial a method of diverting food waste from landfill other than a food waste collection system

✓ Determine an approach that is effective in a densely populated urban area

✓ Demonstrate the social, environmental and economic benefits of home composting

✓ Develop effective methods to assist residents in avoiding food wastage.

Monitoring and evaluation was built into the project planning, allowing on-going adaptive management and adjustment of the program activities and approach. Monitoring of changes in the quantity of food organics disposed was the most challenging part of the evaluation strategy. Several methods were used in combination to determine quantitative results relating to food waste diversion and these included:

✓ **Garbage bin audits** – bin composition including the weight of food disposed to garbage bins in main categories and sub-categories was measured before, during and after the trial

✓ **Food composting tallies** – volumes of food disposed to composts were tallied on-the-spot and then reported online by participants every 3 months through a detailed feedback survey

✓ **Food behaviour diaries** – detailed diaries of food purchasing, preparation and disposal habits were kept by a subsample of trial participants.

Unfortunately due to budget constraints, the methodology used for the bin audits did not produce statistically rigorous data. Further, some of the bins audited were no longer part of the trial and other variables such as seasonal variation were not accounted for. To counter this, results were cross-checked with other projects and NSW averages to rule out anomalies.

Another complication that arose in measuring the effectiveness of the program was to account for the impact of *avoided* food waste. The use of both a 'compost tally' system and a 'food diary' study provided information to estimate not only the amount of food that was composted but also the degree to which households changed behaviour to reduce the overall amount they wasted. While waste is normally measured by weight, the councils found that volume was easier for participants to measure themselves in the home. Participants were to use their 7.5 L kitchen caddy and a "caddy recorder" (a fridge magnet) to tally the number of buckets they emptied into the compost each week. In the 'food diary' study, households were requested to record a range of food-related activities on a daily basis over a week, which provided an insight into the behaviours that resulted in food waste avoidance or the use of the compost system.

After the success of the initial 12-month trial, the councils decided to roll out the program to the wider community. In mid-2011 they developed an online tutorial of the practical composting workshops to improve the cost-effectiveness of the approach. Initial results indicate that the online version is very effective, with at least 90% of the 600 people who viewed the online tutorial still using their compost or worm farm 8 months later. The website and program branding has now been made available to other councils in Australia for a small fee.

The quantitative results relating to food waste diversion which were measured through the above three methods are outlined in the following table.

Table 1: Food organics diversion results

Information Source	Average amount diverted	Comments
Compositional Bin Audit results	1.8-2.3 kg per week per household	Results differed between the audits, **1.8kg** was thought to be lower than actual due to wrong bins being included in sample in the final audit, **2.3kg** was the mid-trial result
Participants 'food waste Tally' results	3.75 kg per week per household 4.55 kg for SUDs 2.95 kg for MUDs.	Converted from volume to weight based on 240L food waste weighing 100kg
'Food Diary' results	5.01 kg per week per household	Actual results from weighing discarded food

Lessons Learnt: A key lesson that the councils learnt through this project was to use methods that actively involved participants in the evaluation process. This not only led to collection of more useful data but also served as an effective tool to improve engagement, deepen the learning experience and promote a feeling of empowerment and contribution.

Further information:

www.compostrevolution.com.au