

Report into the factors that influence community participation
in the Little Stringybark Creek project.

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1) Introduction

The Little Stringybark Creek (LSC) Project, initiated in 2004 by researchers from the Universities of Melbourne and Monash, successfully secured funding to instigate a community-focussed, decentralised approach to the problems of the ecological degradation and biodiversity loss of creeks that are caused by excess stormwater run-off. Excessive stormwater run-off is a direct result of the increased amount of impervious surfaces that are created by urban development, which leads to the problem for creeks of ‘too much water, of too poor quality, at the wrong times’. Solving this problem requires both institutional and collective individual action. The LSC project falls within broad definitions of ‘action research’, as a research approach that is concerned with “research that will have implications for public policy, whether addressing specific practical problems or transforming the broader social structure” (Kwok & Ku 2008; 278). The LSC project is driven by hydrological and ecological research and associated understandings of waterway degradation and is considered to be an innovative pilot project, which can therefore be used to influence future praxis and policy in the field of water-resource management. A central aspect of the LSC project involves the installation of rainwater tanks and the construction of rain gardens on both private and public land, in order to engender the necessary reductions in excess stormwater run-off and to attenuate water inflow into the Little Stringybark Creek following precipitation events. The LSC project is a novel and innovative decentralised approach to stormwater management; no such program has been tried to date in the urban context of Australia. It is envisaged that an evaluation of the process from a community perspective will therefore be valuable to researchers and practitioners, who are involved in decentralised stormwater-management initiatives in future.

2) Scope and structure of the report

Essentially, the success of the LSC project hinges on two key outcomes: the participation of the Mount Evelyn community, whose residents own private land within the Little Stringybark Creek catchment, and the involvement of the Shire of Yarra Ranges, within whose area of jurisdiction the project falls. In this way, the LSC project makes assumptions about human behaviour and decision-making with respect to water management, both at the household-level and that of local government. This report therefore aims to identify the key factors that facilitate and hinder community participation in the project. After outlining the research methodology in section 3, this report moves on to identify and discuss the factors that motivate community participation in section 4. Section 5 then identifies and explores the factors that hinder community participation. The findings are discussed further in section 7 according to a set of key themes that were identified by the data analysis process. A summary of conclusions (section 8) is then followed by a set of broader recommendations and specific actions for subsequent phases of the LSC project and similar future initiatives.

3) Methodology

This research draws mainly on a qualitative research methodology, which is primarily concerned with “how the world is viewed, experienced and constructed by social actors” (Smith, 2005, cited in Johnston *et al.*: 660). According to Denzin & Lincoln (2002), the richer description of social phenomena that is yielded by qualitative methods increases the ability for more accurate understanding and subsequent explanation of social processes. A case-study approach complements this perspective through an emphasis on ‘people in places’, which allows for the attainment of a depth of understanding that broader-scale research omits (e.g. Sayer, 1992; Ragin & Becker, 1992; Mansuri & Rao, 2004; Flyvbjerg, 2006).

This research draws on primary data including ethnographic data, such as field notes from participant observation at site visits, project meetings and community events. In addition, sixty-three interviews were conducted with a range of Mount Evelyn residents. A mix of formal and informal interviews were carried out with residents including successful first-round applicants, unsuccessful first-round applicants, potential second-round applicants and a limited number of residents who have not engaged with the LSC project to date. As it was especially difficult to secure interviews with the last group, successful first-round applicants were questioned about anyone with whom they had discussed their participation in the LSC project with but who had not applied. If an interviewee was able to specify a friend, family member or neighbour, the interviewee was then asked if they had discussed the reasons for their acquaintances' non-participation. Secondary data, in the form of surveys sent out before and after the first phase of the LSC project by the LSC project staff, was also used to inform the research findings¹. The surveys questioned residents about water use, rainwater tanks, rain gardens and attitudes towards stormwater management and the Little Stringybark Creek.

4) The LSC project

The LSC project used a combined incentive-based and education-oriented approach, in order to engage the community and to engender the installation of rainwater tanks and the construction of rain-gardens on private property. The first phase of the LSC project began with an auction process for funding, which incorporated a voluntary offset program. The eligibility of households to qualify for funding depended on their stormwater drainage being directly connected to the creek, whilst the amount of funding provided was determined by the 'environmental benefit' (EB) score that a household's 'disconnection' would provide. Approximately two thirds of the households within the LSC's hydrological catchment are directly connected to the creek via council-maintained drainage systems². In the first round of the LSC Project, the EB score was calculated using factors including: the proposed tank size; the number of residents per household; the amount of roof runoff that would be captured by the proposed system; and the proposed use of the tank water. Before submitting their bid, the householder was expected to calculate the amount of impervious surfaces connected to underground drains on their property, to obtain quotes for the rainwater tank and/or rain garden installation, and then to submit a bid to the project team for the works. Before submitting their bid, the householder had to make a decision regarding the level of their financial contribution towards the cost of the works. The LSC project then calculated the EB scores of the applications and ranked them. In order to obtain best value for money, the LSC project allocated money from a fixed pool of funds according to the level of environmental benefit that the applicants' disconnection from the creek would provide. As the total value of bids submitted in the first round exceeded the amount of funding available to the LSC project, some applicants were unsuccessful in securing funding.

5) Motivating community participation in the LSC project

A variety of factors were found to positively affect householder participation in the LSC project. These factors are related to householder perceptions of: economic incentives, the project ethos, institutional identity and the personality of project staff.

¹ The surveys were conducted, and associated data analysed, by Darren Bos from the University of Melbourne. His permission for me to access this information for the purpose of this research is gratefully acknowledged.

² It is difficult for the LSC project staff to ascertain with certainty whether a property is connected prior to a site inspection, as stormwater drainage systems vary significantly between households depending on the property's age and location.

5.1) Financial incentives and economic motivation

A high proportion of the interviewees had previously considered installing rainwater tanks, whereas only one interviewee had ever previously considered constructing a rain garden on their property, or rather an infiltration system with the same ultimate purpose as a formal rain garden. The financial assistance that the LSC project offers for the installation of rainwater tanks was overwhelmingly the main incentive for people to participate in the project, as they provide households with a water supply that is not subject to water restrictions, constitute a tangible asset, and can reduce water bills. Specific water uses were identified as being major drivers for wanting a rainwater tank, including: watering flowers, vegetables and fruit trees; washing cars; and topping up swimming pools. All such uses have been severely curtailed by water restrictions in recent years due to the ongoing drought in Victoria.

Several interviewees believed that the cost of mains water will increase in future and they therefore wanted to reduce their dependency on the mains water system. For instance, two applicants who were considering retiring in the near future indicated that they wanted to install rainwater tanks whilst they still had the income to generate the capital contribution towards the process, which would then reduce the burden of household utilities when their income is later reduced following retirement. Two other interviewees also referred to their strong desire for their households to be more self-reliant, in order that they were less subject to externally-driven price fluctuations.

Several interviewees observed that the notion of a deadline had added an impetus to getting a rainwater tank installed “before these things [subsidies] disappear” and “to make the most of the opportunity while it’s there”. This notion of ‘making the most of an opportunity’ was conveyed in many interviews, with interviewees reflecting that they did not want to ‘miss out’. Thus, whilst the offer of funding usually provided the main incentive to apply, several interviewees also reflected that the specific time frame of the project had forced them to act on an idea that they had often talked about previously but had never got around to doing. In the second round of the project, the pre-determined timeframe has been removed because the revised process means that it will continue to run until the available funding has been committed, which is beyond the control of researchers as it is determined by the uptake rate of the community as different EB prices are offered. This open-ended process may increase the risk that a householder’s initial interest in the project will wane or that the occurrence of other life events may subsequently prevent or hinder their participation, as discussed later in section 6.3.

5.2) Environmental aspect of the LSC project

Many first-round applicants identified themselves as being relatively environmentally conscious compared with wider society. Thus, whilst acknowledging that they were keenly drawn to the financial assistance provided by the LSC project, many interviewees also reflected that the project’s environmental objectives had appealed to them and had positively influenced their decision to participate in the project. Several interviewees conveyed an ethos of wanting “to do their bit” for the environment or for the local creek, with one resident remarking that, “you’ve hit the spot with the greater good of the creek”. It may be possible for the LSC project to engage further with environmentally-conscious residents by approaching and collaborating with local environmental organisations, such as MEEPA.

5.3) Personality and attitude of the LSC project staff

The personality of the LSC project staff, especially the main staff point of contact for householders, was a significant factor in many households’ decision to participate in the project. Many interviewees

indicated that the public face of the project was friendly, helpful, and courteous. Moreover, the project staff had responded positively and in a timely manner to any concerns or queries of the householder. This aspect had reassured several applicants who had initially been sceptical of the project and was therefore identified by them as having been a critical factor in convincing them to submit an application. The assistance offered by the project staff in filling out the required paperwork was also identified as a critical determinant of participation in the LSC project, as several interviewees reflected that that they would not have been able to complete all the forms without such assistance. Whilst highlighting the complexity of the application process, which is discussed further in section 6.2, this finding also illustrates that having the right person for the job played a key role in securing community participation in the LSC project.

5.4) Institutional identity and research-driven project

Whilst the identity of the institution responsible for running the LSC project, primarily Melbourne University, did not make any difference to some householders, a significant proportion of interviewees indicated that they wouldn't have engaged with the project if it had been run by a government agency or water authority. Their reasons ranged from historical negative experiences with local councils or water authorities, particularly with regards to previous attempts to obtain assistance and then being passed from person to person within a large institution. Hence many interviewees identified the single point of contact that the LSC project features as being a significant positive aspect of the process.

Several interviewees expressed their mistrust in the intentions of government agencies and/or believed them to be incapable of running schemes and projects effectively. In particular, there is a widespread perception amongst residents that the government will start levying a charge on owners of rainwater tanks in future. Reasons cited for this perception include: tanks were not permitted by government authorities in the past so there is suspicion regarding why the state and federal governments now endorse them; assertions that farmers are charged for rainwater tanks; claims that friends or family members have been charged for water tanks; and observations that if everyone has tanks then water authorities will need to recoup money from somewhere and there is a widespread perception that this money will be recovered from tank owners. Several interviewees cited the recent government-run home insulation scheme as an example of government incompetence in running projects. In contrast, one householder observed that it was "good to see the researchers doing this kind of thing, cos quite often you know, the research just sort of stays there in the universities and it doesn't really help anyone so yeah, we really liked that side of it". In this case, a positive impression of the LSC project has simultaneously enhanced the householder's opinion of the wider research community at large.

In addition, several participants observed that the research ethos of the LSC project had positively influenced their participation because the formal presentations given by researchers at the outset of the LSC project and subsequent meetings and information sessions had been driven by 'passion' and 'altruism' rather than simply being their job. This ethos had made participants feel enthused by the LSC project, keen to contribute and also more willing to talk about the LSC project to friends and family. As the research aspect had played a significant role in engaging the first-round applicants, many interviewees also expressed the desire to continue receiving updates about research related to the LSC project via an ongoing newsletter or some form of community-based network.

6) Preventing participation in the LSC project

Through the first phase of the project, fifty four properties installed rainwater tanks. Only seven of the applicants opted for a rain garden in addition to the tank(s). The factors that positively influenced community involvement have been explored above. The report now moves on to discuss the hindering aspects of the LSC project process, as well as the reasons for the non-participation of the remaining approximate six hundred eligible properties. The implications of the findings for the LSC project are briefly discussed within this section, whilst broader recommendations are returned to in section 9.

6.1) Community engagement

The LSC project used a series of postal mail-outs to invite householders to participate in the LSC project and to attend a number of community information events. During the first round, an article in a local newspaper also featured the project. Many successful first-round interviewees revealed that they were originally suspicious of the mail-out letters because, “you get so much rubbish through the post these days and to be honest, I don’t normally read that stuff, I just put ‘em in the bin” and that, “things like this, they normally just turn out to be a scam or some kind of gimmick thing”. Many potential second-round applicants also confirmed that they had initially been suspicious about responding to the unsolicited mail outs in the first round. Nevertheless, public trust in the LSC project has increased over time with several successful applicants asserting that their neighbours or friends who had initially been sceptical in the first round were now interested in the project themselves. These findings demonstrate that word of mouth is a key method by which information about, and trust in, the LSC project has spread between the first and second phases of the LSC project.

6.2) Complexity

In the first round of stormwater tender, residents were required to submit a two-page application form, which required them to ascertain the amount of paved surfaces connected to drains, the percentage of roof area connected to underground drains, and the area of roof unconnected to underground drains. Several potential second-round applicants indicated that they had been unsure how to obtain this information and had therefore been put off applying to stormwater tender, whilst others revealed that they had begun the application process in the first round but on finding that “it was too complicated”, had not pursued their initial interest. Additionally, some interviewees displayed a significant level of confusion towards the auction process, with one resident reflecting that her husband had “stuffed up our application” and another resident observing that they hadn’t realised that they were essentially competing against other residents for the funding and so had “just asked for what the plumber said it would cost”. Such quotes illustrate that some applicants did not realise that they were expected to contribute and/or did not appreciate the competitive element of the auction process in stormwater tender.

A large number of successful applicants identified that their personal affinity and/or aptitude with figures and calculations (resulting from their occupation or education history) had been a key factor in their willingness and ability to participate in the project compared with their fellow residents. For instance an interviewee reflected that, “it was easy for me because I’m an engineer so all those calculations were fine for me, the roof area and stuff, but for a lot of people it’s not going to be”. Many of these interviewees drew on specific examples of neighbours or friends who had been put off applying to stormwater tender due to the numerical complexity entailed by the application form and process. Consequently, the first tender process was perceived amongst all interviewees as being excessively complicated. Lessons have already been learned by the LSC project in this regard, such that

the second phase involves the amount of impervious surfaces, drainage system and the EB score being calculated by project staff during a single visit to the household.

The new emphasis on a household visit by project staff also means that applicants do not have to formally request assistance, which is considered important because, notwithstanding their numerical ability, householder personality also played a role in participation. For instance, as one interviewee revealed, "I'm the sort of person who will ask for help and I will ask again and again until I understand but most people are not like that, you know they feel stupid to keep asking". Whilst first-round applicants were offered the opportunity for a household visit to assist them with their application, very few households opted to do so. Aside from trust in the LSC project (discussed further in section 6.4 and 7.1), this finding suggests that embarrassment and fear of appearing 'stupid' may have prevented some households' participation.

6.3) Time burden, apathy and livelihoods

Several interviewees also identified the bureaucratic aspect of the application process as being a key hindrance to participation. They found the form-filling and process of obtaining plumbers quotes especially off-putting because they were time-consuming and, therefore, perceived as a hassle. A successful applicant reflected that, "I mean my wife loves paperwork but probably if I was here by myself then probably I'd have left it to be honest, maybe it would've been more hassle than it's worth". Several successful first-round applicants also drew on specific examples of neighbours who had been put off applying for this reason. For instance, "he [neighbour] said he just couldn't be bothered with all that paperwork, you know the forms you had to fill in [to apply for funding]". The second phase of the LSC project involves applicants submitting fewer and simpler forms to the project staff, which these findings suggest will have a positive impact on community interest as the time burden of engagement with the project that was previously invoked to the householder has largely been transferred to the LSC project staff.

Many potential second-round applicants identified that 'life events' had prevented them from engaging with the first round of the LSC project. For example, a young mother who had registered an interest in stormwater tender but who had not subsequently submitted a bid reflected that, "I'd just had [baby] so my mind was really just on all that and I started the application thing but then I just never really had the time to do anything about finding out all that stuff and getting a plumber to come round so you know, I just put the letter on the side and you know how it is, somehow I never got round to doing it then". Common occurrences that were cited as reasons for not applying to the first round included: expecting a baby, experiencing difficult family times, renovating a house and being away overseas. This finding strongly suggests that the use of project phases is optimal to the ultimate success of a project that requires community participation, as different people were both more willing and more able to engage with the process at different stages of their lives.

Several interviewees reflected that they didn't feel that it was worth the 'hassle' of completing the paperwork and doing the calculations for what they perceived to be only a chance of obtaining funding. Thus, the reduction in the amount of paperwork and reduced complexity of application forms in the second round are therefore likely to reduce the perceived risk that the householder is 'wasting their time' compared with submitting a bid under the auction style application process of the first round. In particular, the need for the householder to get quotes independently from plumbers was perceived as being a particularly onerous requirement, thereby supporting the more recent approach of the LSC project whereby a member of the project staff attends the household at the same time as a

vettted partner plumber. This process minimises the hassle to the householder compared with a process that involves them having to chase up quotes from tradespeople.

6.4) Financial resources, trust and risk

Several interviewees and survey respondents were put off from applying to the initial stormwater tender due to the large capital outlay that they were required to pay upfront before the LSC project's contribution would be reimbursed. Whilst several people were simply unable to afford this capital outlay, others were concerned about whether the money would be repaid once the work had been done. For example one interviewee observed that, "we were lucky cos my brother-in-law is a plumber so he did the work [...] He also didn't mind that we didn't pay him till the money came through. I mean we would also've been happy to put it on the visa card but not everyone's like that. And also there was just that worry; that maybe the money wouldn't come through and you've already got the tank then and the plumber to pay for". The size of the upfront payment incurred to the householder has been reduced in the second round by the selection of partner plumbers who can be paid directly by the LSC project, whilst the notion of trust is returned to later in section 7.1.

Whilst the original auction process entailed residents bidding for a specific amount of money, this amount was not ultimately guaranteed and several interviewees observed that they would have preferred to know the amount of assistance that they would receive from the outset even if this had been less than what they were hoping or expecting to receive. For example, one resident indicated that not knowing what they would receive from the outset had made them unwilling to apply in the first round because they felt that, "it wasn't really that clear you know and you didn't really know what to expect and all that, most people you know they like to know what they are gonna get before they say if they are gonna go for something". Another interviewee asserted that the unwillingness of the LSC project to specify a fixed contribution at the outset meant that "it all seemed a bit dodgy you know, them not saying what you could expect to get". In the end, the interviewee didn't apply to the first round because they perceived it to be some sort of scam. In the second phase, both an upfront offer from the LSC project and a plumber's quote can be provided instantly during the household visit. One partner plumber provides their quote on the spot whilst the other sends a quote by postal mail afterwards. Of the two, the former has been more successful in being contracted to do the work. Aside from potential personality and cost differences, this observation reinforces the finding that householders prefer to know what they are required to contribute upfront, which ultimately affects their perception of the transparency of the project, as illustrated by the quote above.

Two potential second-round applicants reflected that they had been concerned about contacting the LSC project in the first round because they were worried that they would be pressured into buying something. In both cases, this fear was only overcome after they had been reassured by a friend or neighbour that this was not the case. This notion of trust links back to the importance of the public face of the LSC project, not only in terms of being a person that potential applicants perceive as trustworthy (see section 5.3), but who also does not display an overly persuasive or aggressive demeanour during the household visits.

Whilst most of the people interviewed were not concerned about unknown people coming round to their property, several of them reflected that this factor is likely to have played a role in the reticence of other households that have not engaged with the project to date. For instance one interviewee remarked that, "I spoke to [neighbour] about it [the LSC project] one time and he just said what he does is his business and so he just didn't wanted to be involved with it, I think there's still the worry

that people will start charging them for the tanks one day". Some interviewees also reflected that the prospect of a house visit might appear especially threatening to single, disabled or elderly residents. Information events in 'neutral' community spaces are therefore considered to be a valuable mode of community outreach, particularly at the project outset before word of mouth begins to overcome the initial mistrust of residents towards externally-operated projects.

6.5) Household and property factors

Several household factors affected willingness of households to participate in the LSC project. Most interviewees who had successfully obtained funding in the first round expected to reside in their property for the medium to long term future. Of the two potential second-round applicants who envisaged remaining at the property only for a short term duration, one applicant decided to go through with the application because they felt that the tanks would add value to the property when they came to selling it, whereas the other decided not to participate because they didn't feel that it was worthwhile investing finance in the house. One interviewee also recounted that their neighbour had also wanted to apply to stormwater tender but had decided against it because the house was a rental property and the owner hadn't been interested when they approached them about it so they were therefore concerned that they may not see a return on any investment in the physical infrastructure of the property. These findings indicate that the anticipated duration of residence and security of tenure influence householder participation in the LSC project, in turn suggesting that this type of community-oriented initiative may be more successful in areas where home ownership amongst residents is high and where the turnover of housing stock is low.

The physical layout of the household was also identified as a constraint to the installation of tanks and the construction of rain gardens, not only in terms of the physical space required for the tank or rain garden but also in terms of the width of points of access to the property for getting the tank or an excavator (required for the construction of a rain garden) onto the premises. Similarly, several interested properties with steep gradients were also considered unsuitable for the construction of rain gardens. Thus it is recommended that future projects carry out an initial scoping study of the proposed catchment, including factors such as slope aspect and property size, in order to assess the suitability of the proposed catchment for the retrofitting of infiltration systems and rainwater tanks.

Furthermore, many people in the area already have rainwater tanks and therefore do not perceive the financial assistance for a tank as being a significant incentive to engage with the LSC project. For instance one interviewee considering applying to the second round pointed out that "to be honest with you we didn't really think it was that important cos we already have the tanks". However, many existing tanks are only used for external purposes, such as watering gardens and washing cars, and are not connected for internal household use. In order to reduce run-off to the creek, the LSC project literature could emphasise that funding is available to maximise existing stormwater storage facilities via the connection of existing tanks to internal water use.

6.6) Community perceptions of rainwater tanks and rain gardens

Several potential applicants were worried about the cosmetic appearance of tanks and the associated pipe work that is necessary for getting stormwater into the tank and the tank water to a point of use. For instance, a potential second-round applicant pointed out that whilst the "front garden would be perfect, my wife won't have one there cos it'd ruin the view from the front window", whilst other residents expressed significant concerns about the amount of new downpipes and the colour of tanks that proposed systems would entail. It may therefore be useful for the LSC project literature to

address such concerns by stating that rainwater tanks can *often* be rendered unobtrusive, notwithstanding that, in practice, this will depend to an extent on the layout of the property. However assuaging potential concerns from the outset may at least generate the initial interest required for the householder to establish contact with the project. Once the interested party has heard more about the aims of the LSC project and met the project staff, they may then be more willing to accept a degree of change to the appearance of their property due to a greater appreciation of the reasons driving the project and a greater degree of familiarity with it.

Several potential second-round applicants were also concerned about the disruption that the installation works would cause, especially of rain gardens. The partner plumbers are sensitive to this, and have been conscientious about leaving properties in a clean, tidy state. It may be useful for the LSC project literature to specifically address this concern and/or to include a link to the project website, which could feature a sequence of dated photos illustrating the quick recovery of the disrupted areas of the demonstration gardens.

Cognitive processes further influence participation. For instance, many interviewees observed that rainwater tanks have a direct and tangible benefit for the household. Conversely, most people perceived the rain garden to have only a wider, environmental benefit. The desire to possess rainwater tanks was therefore a more significant driver of householder participation than the ownership of a rain garden. Moreover, several interviewees associated rain gardens with a negative impact on the household due to their perceived creation of 'soggy' ground, such that a common concern relating to rain gardens and infiltration trenches is that they become full of water and then the ground becomes saturated causing flooding to their or their neighbours' property as a result. In this way, a common perception of an infiltration system or rain garden is associated with a negative connotation. Underlying this perception of infiltration systems is householder understanding of hydrological processes.

6.7) Conceptual understandings of hydrological processes and the Little Stringybark Creek

All the interviewees who had opted for a rain garden in the first round, or who were not concerned about installing one in the second round, demonstrated a high awareness of the hydrological principles of infiltration, either as a result of a science-oriented higher education and/or a practical farming background. In particular, interviewees who had grown up on farms demonstrated an exceptionally clear vision of how the run-off infiltration is beneficial to surrounding trees and lawns. Another participant identified how they had trained as an ecologist and now wanted to put the associated environmental principles that they had learned into practice, in order to benefit the environment. These interviewees were not concerned by the prospect of constructing a rain garden or infiltration trench on their property in contrast to the vast majority of other interviewees, who felt that they needed to know more about infiltration systems before making the decision whether to apply for an infiltration system.

The unfamiliarity with infiltration systems can be overcome. For example, several potential second-round applicants described how the demonstration rain garden day had improved their understanding of the function and operation of infiltration systems and indicated that seeing one had made them more willing to consider including one in their application. This finding further demonstrates how cognitive processes interact with community participation in environmental initiatives, and suggest that the education element of the LSC project is worthwhile and highly relevant to the project staff's efforts to trigger action and to transform behaviour at the household level. As well as the community

information sessions, a strategy of regularly featuring articles in diverse local media about infiltration systems and their relationship to creek health would also maximise community exposure to relevant concepts and increase general awareness and understanding of the issues at hand and the LSC project as a proposed solution.

Amongst many residents, there is a widespread lack of knowledge about where the Little Stringybark Creek is located, as well as a common perception that it is not a natural watercourse but a man-made drainage channel. Such understandings were explained by the small size of the Little Stringybark Creek and the confusion surrounding whether Melbourne Water or the Council of the Shire of Yarra Ranges is responsible for the Creek. The Creek also runs through privately-owned land for much of its course so, unless residents have a property through which the Creek flows, their interaction with it is limited, if at all. The small size and limited public access of the Little Stringybark Creek mean that there is an absence of community ownership of the Creek in the way that residents adjacent to a larger public waterway often demonstrate via public waterway-focused groups, such as the 'Friends of' groups. Furthermore, whilst a limited few interviewees had recognised that excess stormwater was a problem for the Little Stringybark Creek prior to the LSC project, the vast majority of interviewees indicated that they did not previously consider it to be an issue. Consequently, several interviewees asserted that the community information events on this topic had strengthened their desire to apply, even though the offer of funding had been their main motivation at the outset. In this way, human action and behaviour are observed to be linked to cognitive process, including: understandings of an issue; attitudes towards a resource; and perceptions of the existence and immediacy of a threat to the resource.

6.8) Perceptions of the LSC project

Whilst the predominant perception of the LSC project amongst interviewees was highly positive amongst successful first-round applicants and potential second-round applicants, some of the interviewees who had been unsuccessful in getting a grant through stormwater tender expressed negative feelings towards the LSC project. Specifically, they felt that the process had been misleading. These interviewees were therefore unwilling to apply to the second round; the main reason being that they felt that they had already 'wasted their time'. Two interviewees also felt that they had been misled into believing that they would receive funding and had then been disappointed not to. The LSC project originally anticipated that they would be able to fund more properties than were ultimately funded due to the costs of tank installation and rain garden construction being higher than originally envisaged and expectations that households would contribute higher amounts towards the installation costs. However, whilst the LSC project staff may have placed a greater emphasis on the probability of success, several unsuccessful applicants stated that they had been warned that they might not receive any funding. In addition, a discourse analysis of the early LSC project literature and participant observation at household visits indicates that the potential outcome of no funding was explained to applicants from the outset. Nevertheless, due to the large amount of information and new concepts that the householder was expected to engage with during their involvement in the LSC project, it is probable that the possibility of a bid being unsuccessful was either overlooked or misunderstood by some applicants.

Several unsuccessful applicants also reflected that they felt that the LSC project was unfair, as they had not been offered any funding at all whilst they were aware that others had received large grants. Moreover, the unsuccessful applicants tended to be those households who felt that they were already behaving in an 'environmentally responsible' manner (e.g. had smaller rooves, were letting

stormwater drain directly onto the ground around their property, allowed the Creek to flow naturally through their property, planted native species etc). Two interviewees therefore felt that it was especially unfair that they had been denied funding by the LSC project because it is essentially underpinned by an environmental ethos and they perceived themselves as being 'good' in terms of their environmental behaviour, whereas people who were less environmentally friendly than themselves had been given funding for a rainwater tank. Furthermore, unsuccessful applicants tended to be less affluent, with smaller houses and associated impervious surfaces, which reduced their potential EB score. Hence two interviewees expressed the opinion that it seemed unfair for the LSC project to be providing funding mainly to wealthy households. Consequently, such interviewees were less willing to recommend the LSC project to other residents or to participate in the second round. These findings also suggest that some applicants did not fully understand the funding criteria or the ultimate purpose of the LSC project. Future projects that utilise an auction process and intend to conduct several rounds should therefore give consideration to the mode and phrasing of an explanation to unsuccessful applicants regarding failed bids.

In section 5.2, the environmental objectives of the LSC project were identified as an attractive feature for motivating community participation. Conversely however, the environmental ethos that underpins the LSC project can also be a detrimental feature to householders who distrust the environmental movement. As one successful applicant said, "I've got friends who just say that it's all green lunatic nonsense so they're just not interested at all, they think it's all a load of rubbish to be honest with ya". It is unlikely that the LSC project can engage with people who are firmly entrenched in an anti-environment mindset, as they are likely to reject the project from the outset due to its environmental ethos and objectives. Such distrust is reflected in wider socio-political debates surrounding the impact of humans on the biosphere within the Australian and international media. In particular, six interviewees linked their initial scepticism of the LSC project to a recent government-run home insulation scheme, which featured environmental (in addition to economic objectives) objectives. The practical implementation of the insulation scheme was flawed and consequently received a significant amount of negative media attention in the Australian media. My findings suggest that the public perception of this scheme has negatively impacted on public receptiveness towards other projects and schemes, which involve intervention at the household level and address environmental goals.

7) Discussion

7.1) [Dis]Trust

Community trust in both the LSC project and in the project staff was highly significant in determining household participation in the project. Even amongst most successful first-round applicants, interviewees reflected that at least one household member had been suspicious at the outset and it had usually taken one member to convince another to find out more about the LSC project as an initial step towards their involvement. Even once they had submitted an application, several interviewees identified a feeling that they had 'taken a chance'. Amongst the majority of potential second-round applicants, their trust in the LSC project had increased significantly since the first round due to recommendations by local friends, family or neighbours who had been involved in the first round of the project. In this way, community participation in the LSC project can be interpreted as having increased due to an initial set of 'risk takers' who were willing to take a chance. A further set of residents were then willing to engage with the LSC project once they were able to observe or their friends' or neighbours' success. This observation highlights the difficulty for an external and/or unfamiliar institution to engage with a set of actors and has an implication for the envisaged

timeframe of a project that aims to stimulate community action. In this case, community levels of trust in the LSC project have increased significantly over time, suggesting that medium to long-term timeframes are required to achieve the requisite level of community engagement, in order that environmental objectives are ultimately realised.

7.2) Environment and society

As the roof size and any additional impervious surface areas (e.g. paved areas) of an eligible property are the fundamental drivers of its environmental impact on the creek, it is more likely that affluent properties will obtain higher EB scores, as they are generally, but not exclusively, associated with larger roofs and a greater amount of paved surfaces vis-à-vis less affluent properties. As the LSC project gains more value for money from funding properties with a higher EB score, it is more likely that households of a higher socio-economic status will benefit from the project. Furthermore, despite inter-property variation in plumbing system costs, the range of essential components (e.g. tank, filter, pump, downpipes) mean that the differential in costs between plumbing systems is driven mainly by the property layout and the intended use of water rather than by property size, which is the main determinant of the EB score. Therefore, it is more likely that larger [more affluent] households will have the installation costs offset to greater degree than smaller [less affluent] properties making it a more attractive option for them to participate at lower EB prices.

Expecting residents to pay upfront for the total cost of the works in the first round is likely to have marginalised residents from lower socio-economic groups, as they could not afford to take the risk of not receiving the rebates nor to physically come up with the necessary capital contribution for the works, whilst privileging more affluent residents who have access to higher amounts of disposable capital and who are more able to take the perceived risk of paying upfront. In the second round, the process of offering a low EB price at the outset, but which is highly likely to rise, also privileges affluent households because they are more able to take the risk that the EB price will not increase. Whilst the LSC project staff strongly anticipate that the EB price will rise and, therefore, that early applicants will have some monies refunded at a later date, the ability of more affluent householders to manage the inherent risk that comes with an uncertain and unknown price rise puts them at an advantage compared with less affluent households.

It is important to note that the central aim of the LSC project of reducing the impact of surrounding human development on the flow regime and water quality of the creek is driven by environmental, rather than social justice, concerns. As the funding of the LSC project is limited, the project therefore needs to obtain the best environmental benefit for its funds. However, the consequence of offering zero funding to some households is that the consequent negative perception (section 6.8) may impact detrimentally on the spread of the project uptake, as it was revealed in sections 6.1 and 7.1 that many applicants to the second round have been influenced by word of mouth. Thus an outright rejection of funding is likely to fuel existing concerns and some perceptions that the LSC project is more hassle than it is worth. One potential solution could be to offer a guaranteed minimum funding amount to all those who apply, which would not eat significantly into the overall budget but potentially keep people 'on side' and maintain a positive image of the project.

7.3) Social networks

People who were either plumbers themselves or who had utilised plumber friends or family members felt that they had been lucky in this regard; they felt it had made the installation process both easier and cheaper for them compared with other residents, as they had had access to favourable rates and

trustworthy advice. Conversely, several interviewees who had used plumbers that they had picked randomly had had negative experiences with the plumbing element of the project process. In this way, personal social networks had facilitated some households' participation in the LSC project.

Social networks have also played a central role in changing community perceptions of, and therefore household involvement in, the LSC project. For instance, the main approach for contacting households at the outset of the LSC project was via postal mail. Section 6.1 indicates that unsolicited post is perceived negatively by most interviewees and is consequently associated with very low levels of trust. Word of mouth has since worked positively in terms of generating further public interest in the second round of the LSC project. To increase community engagement in both future projects and the second round of the LSC project, concerted efforts to access existing informal social networks would be worthwhile. A potential strategy for accessing these more trusted networks earlier in the project would be to conduct an initial stakeholder network analysis, in order to identify and to subsequently target these existing informal networks. Interviewees indicated that the following social networks could be used to garner further support for the LSC project: Mount Evelyn Environment Protection and Progress Association (MEEPA), the Rotary club, Mount Evelyn Church, Mount Evelyn Community Link, Mount Evelyn local newspaper (the m2), the Mount Evelyn Community website (see <http://mtevelyn.com.au/>) and the Mount Evelyn Neighbourhood Watch committee. A combination of oral presentations to such groups, as well as paid-for adverts and informative articles in associated newsletters, would help to raise awareness of the LSC project and would afford residents the opportunity to meet the project staff, in order to build the familiarity that is often associated with higher levels of trust and reciprocity (e.g. Putnam, 1993; 2000; McKenzie Mohr & Smith, 1999).

7.4) Relationship between the research project and the plumbing industry

Several first-round applicants had experienced problems with the plumbers that they had used; either they had been unreliable or their work had been faulty. Several interviewees had also received conflicting advice from the listed plumbers regarding rain gardens. Whilst these interviewees separated their perception of the plumbing industry from that of the LSC project and reflected that their negative experiences of the plumbers had not influenced their overwhelming positive impression of the project as a whole, it is nevertheless an issue that could discourage other potential applicants. The decision to select partner plumbers and their simultaneous site visit with the LSC project staff for the second round not only reduces the time burden of participation for the household, but also provides more oversight of the plumbing aspect of the process.

7.5) The complexity of household decision making and participation in the LSC project

The motivations for households to participate in the LSC project that have been identified in the previous sections include the financial incentives, the environmental ethos of the project, not wanting to miss out on an opportunity, and an interest in the research aspect of the project. In reality, for the majority of the interviewees, no one single motivating factor had influenced their participation exclusively. Rather, a combination of 'internal' household factors and 'external' factors related to the LSC project had driven them to engage with the process. Nevertheless, as one interviewee pointed out, "at the end of the day, the bottom line is the economics for us". For a householder, the question of whether it is worth investing personal financial resources depended on three main factors: affluence, the anticipated longevity of residence at the property, and the intended use of the tank water. Affluence fundamentally affected whether a household is able to make a financial contribution. Anticipated length of residence determined the likelihood of the householder recouping the initial capital cost through the saving of mains water and, therefore, whether it was perceived as being

worthwhile investing both time and finances in applying to the LSC project. Finally, willingness to invest in a stormwater harvesting system was generally higher if the household had a strong desire to use water for a purpose, which is not permitted under water restrictions. The main incentives and disincentives that were associated with rainwater tanks and rain gardens by interviewees are summarised in tables 1 and 2 below.

Table 1. Incentives and disincentives of rainwater tanks from a householder perspective

Rainwater tanks	
Incentives	Disincentives
Reduced household water bills	Reduced selling potential of the property
Added value to the property	Cosmetic appearance of tanks and pipes
Provides a water source that is exempt from water restrictions and can therefore be used for garden watering and car washing	Most houses have tanks already (but most are not connected for household use)
Increased self-sufficiency of household	Distrust of a process involving the formal registration of rainwater tanks due to common perception that this will incur a charge in future
Provision of water storage for periods of fire risk	Disruption to the property during installation

Table 2. Incentives and disincentives of rain gardens from a householder perspective

Rain gardens	
Incentives	Disincentives
Contribution to healthy lawn	Dislike their appearance
Beneficial for nearby trees	Take up too much space
Environmental benefit to the creek	Unfamiliarity with their purpose and operation
Reduce flow into the Creek and therefore the flood risk to properties that are located further down the catchment	Perception that their construction will kill nearby trees by disrupting root systems
Good for native flora and fauna	Concerns that they will cause water ponding and damage to property
Like their appearance (formal rain garden)	Disruption to the garden and/or property during construction

Whilst participants in the first round identified several factors that had contributed towards their motivation to participate, the overwhelming motivation was the funding that the LSC project provided towards the installation of a rainwater tank (see section 5.1). Further interest in, and uptake of, the LSC project is therefore likely to be restricted by the fact that many people in the Mount Evelyn area already have rainwater tanks. Furthermore, it is highly likely that the more affluent and larger households already have rainwater tanks, such that the primary motivation for participating in the LSC project applies to smaller and less affluent properties, which do not have such a detrimental impact on the Creek. However, many of the existing tanks are not connected for internal household use, such that there is scope for the LSC project to reduce impact on the Creek by rendering existing household water storage systems more effective in terms of water retention. As several interviewees observed that the project promotional material was very time-consuming to read, targeted promotional material on the funding available for connecting existing tanks to internal use may reach out to more of the relevant households. However, the latter observation also highlights a key dilemma for the LSC project: different householders are motivated by differing factors to participate, yet many interviewees indicated that the length of the project’s introduction material had been off-putting to

their friends and neighbours. This finding suggests that the utilisation of a wide range of different types of media, which variably highlight different attractions of rainwater tanks and rain gardens, is necessary for the engagement of a significant number of households overall.

8) Summary of conclusions

Whilst the motivation to participate in the LSC project varied with household, the major incentive was identified as funding for a rainwater tank. Householder participation was more strongly driven by the desire for a rainwater tank than for a rain garden, as rainwater tanks are perceived to be of greater utility and benefit to the household than an infiltration system. These findings indicate that a tangible and personal incentive, or perception thereof, is necessary for triggering action or behaviour change with respect to decentralised stormwater management. Furthermore, the major determinant of most households' decision to participate is the financial cost of their participation, such that the provision of an economic incentive is likely to be the most effective means of securing public participation in a project.

Yet in most circumstances, no single factor determined household participation uniquely, rather a range of economic, environmental and social factors intersected to facilitate and constrain community participation. Key facilitating factors of the LSC project to community participation were identified as: the financial incentive, the research aspect, the environmental ethos, and the personality of LSC project staff. However, the environmental ethos also worked to the opposite effect amongst some residents, who are sceptical of environmental initiatives and the environmental movement more broadly. In this way, a feature of the project that constitutes a motivating factor for one household may represent a barrier to participation for another, which highlights the difficulty for the LSC project of ultimately realising the total disconnection of all impervious surfaces.

Whilst the internal constraint of limited funding restricted more extensive community participation in the first round (more people submitted bids than were allocated funds), section 7.1 revealed that initial distrust on the part of residents had a significant detrimental impact on community participation in the first round of the LSC project. Since then, the LSC project has secured more funding for a second round of the project and has made significant progress in terms of community trust, mainly via word of mouth amongst residents because the perception of residents who have engaged with the LSC project to date is overwhelmingly positive. Nevertheless, a key hindering factor to community participation was the perceived complexity of the auction process and, therefore, the time burden on the householder that their participation in the LSC project required. Thus, whilst an auction process may represent best value for money per environmental outcome, the research findings suggest that an auction process may not be an optimal strategy for facilitating the community participation, upon which the environmental outcome ultimately rests.

9) Recommendations

Having outlined a set of motivating and hindering factors to community participation, it is recommended that the LSC project and other similar initiatives engage in a concerted effort to mitigate as many of the barriers and obstacles to community participation as possible. As the motivation to participate varied and time poverty was high amongst householders, project literature needs to highlight the economic, environmental and social motivations to participate with varying prominence. As word of mouth played such a critical role in ameliorating community trust in the LSC project, another broad recommendation is to pursue a strategy of trust-building from the outset of a decentralised stormwater management project. The process of trust building requires time, which

therefore needs to be factored into project planning. Planning for a project to run over a significant time period is also likely to improve the ultimate success of a project, as the results showed that interested households may not be able to engage with the project if it takes place over a shorter timeframe due to livelihoods events that take priority.

Based on the findings presented in this report and discussions with interviewees and LSC project staff, a range of specific actions for further phases of the LSC project or for future similar initiatives could potentially include:

- Conduct a stakeholder network analysis at the outset of a project, in order to ascertain the formal and informal social networks that already exist within the target community;
- Establish contact with existing networks and institutions with the aim of securing assistance for the dissemination of project information e.g. via publications, newsletters or presentations to members of local clubs and societies;
- Regularly feature the project in local media;
- Construct interpretive information boards at local demonstration sites so people are able to access relevant information at times convenient to them and in a 'low pressure' situation;
- Keep project information and advertising material as brief as possible;
- Selectively target the dissemination of information and advertising material when possible e.g. highlight the environmental dimension of the project in material disseminated to local environmental groups;
- Alternate the prominence of the varied incentives to participate within the project information and advertising material e.g. economic, environmental, community benefit;
- Highlight how innovative the LSC project is and specifically point out that community participation is required to make the project a success;
- Use a variety of formats for mail-outs, including some promotional literature that does not require an envelope to be opened;
- Incorporate scope for multiple phases of the project to run over a substantial time frame;
- Create a sense of being part of a community movement with a newsletter featuring 'fun' articles and initiatives e.g. timelines, best performing streets, pick of the 'best-displayed' project boards;
- Foster a sense of competition for the funding using techniques, such as incorporating a barometer of the number of properties disconnected in promotional material;
- Use an incentive designed to entice an initial set of 'risk-takers' e.g. offer the first house on a street to sign up a guaranteed percentage or amount of funding towards the works;
- Set up an online forum or distribute a participant contact list (secure prior consent from the householder) so that participants can draw on local support for any technical issues that arise from rainwater tank or rain garden installation.

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