Water Efficiency Conference 2016

Co-watering the grassroots: combining community participation and social entrepreneurship to share roof runoff

Sarah Ward*

Centre for Water Systems, University of Exeter, North Park Road, Exeter, Devon, EX4 4QF

ABSTRACT

This extended abstract shares a firsthand narrative of a pilot project using a co-productive participatory approach led by a social enterprise to share roof runoff between different properties. Conceptually, the project was simple to formalize and initially received wide industry support. Facilitated by an 'expert' in the field and with start-up funding secured, the technical aspects of the initiative were potentially straight forward. Engagement with a community group to initiate a pilot project was also straight forward, entailing a conversation about growing plants on an allotment without a mains water connection and an enthusiasm to use roof runoff from nearby houses. However, in the co-production of the pilot invisible technical and organisational complexities were made visible. For example, land ownership and management issues meant that the actor-network concerned expanded to include a number of unanticipated organisations, applications and fees. The dynamics of these tensions are summarised, demonstrating that the interplay between the organisational and technical aspects resulted in difficulties in practice. Though not unresolvable, they significantly delayed the completion of the pilot, absorbed a substantial amount of energy from the actors involved and impeded the collection of empirical data through which to evaluate the project concept.

Keywords: complexity, co-production, participatory, rainwater harvesting, social enterprise

1. INTRODUCTION

Socio-technical approaches to urban water governance and management are recognised as key to transitioning the sector to a more resilient and sustainable future [1] [2]. Participatory methodologies are also increasing in profile in a sector that is moving beyond engagement methods such as consumer challenge groups and online surveys, to consider the role of wider citizen perspectives and service innovation within future water provision [3] [4]. There is room for top-down and bottom-up approaches, including social enterprise, in utility sectors as shown through the example of community energy initiatives [5]. Additionally, the rise of local food movements and urban agriculture [5], as well as the continuation of traditional allotment use, generates a growing demand for water that may need to be met through alternative water supply systems, particularly for the latter, which has experienced increases in mains water charges by local authorities (LA) in recent years. However, whilst bottom-up approaches to water infrastructure and services and in particular for decentralized systems such as rainwater harvesting, are visible in countries such as Mexico (project Isla Urbana) [6] [7] and India (project Aakash Ganga) [8], such initiatives are yet to emerge in the UK. Through the use of a firsthand narrative in relation to a pilot project for a rainwater-orientated participatory social enterprise ('RainShare'), this paper aims to elucidate some of the potential reasons behind the apparent lack of progress in this area.

*E-mail address: sarah.ward@exeter.ac.uk

2. METHOD

To develop the conceptual stages of the runoff sharing enterprise and initiate the participative aspects, a pilot project was established ('the pilot'), funded by a specialist social enterprise funding organisation. The pilot enabled experiential learning and co-creation to form the foundation of the enterprise from the very beginning. In the interests of anonymity regarding the community groups and organisations embedded in the pilot, generic descriptive names are utilized herein, rather than their actual names and names and locations are omitted from all Figures. In early 2015, conversations were held with several residents near and users of an allotment site illustrated in Figure 1.

Fig. 1. The pilot project allotments, adjacent row of houses and Highways adopted footpath situated between the two

The topic of conversation was water resources available to and used by the allotment holders (AH) to water their plants/crops ('plants'). It transpired that there was no mains water on site; the option had been explored but was too expensive to install. Consequently, the AH were very water conscious and were already innovatively managing water by: (i) bringing it with them from home in watering cans; (ii) capturing and storing small amounts of runoff on site via tiny improvised catchment areas (<0.5m^3) and containers; (iii) growing plants that required minimum watering between rainfall events: and (iv) occasionally pumping water from a water butt located at a nearby house through a hose to a water butt on site. Despite these interventions, the AH had a desire to improve their water availability to enable them to better cope with longer dry spells and increase the range of plants they could grow. Conversations turned to how a runoff sharing scheme could be developed based on the existing intervention outlined in (iv) above, but on a more permanent basis. This would potentially be able to provide both a source of non-potable water and also to reduce the discharge of roof runoff to the local sewer (to help maintain capacity/reduce risk of surcharge/flooding).

After some further discussions and technical evaluation of the supply-demand balance of the site, it was decided to proceed with a pilot project to connect the downpipes from one of the houses adjacent to the allotments via some additional pipework to a storage tank (1m^3) situated on the allotment site – essentially a rainwater harvesting (RWH) system distributed across two different properties. The main unknown risk identified oriented around a footpath running at the back of the houses and between them and the allotments (Figure 1). To enable the roof runoff to be conveyed most efficiently and automatically to the storage tank, a conduit with a small bore pipe required installation under the footpath. Consequently, its status as being Highways adopted or not became a primary concern for the pilot. This is discussed further in the Results and Discussion section.

By following and reflecting on each stage of the pilot's development, the conceptual and theoretically ideal process for sharing roof runoff was co-created and is illustrated in Figure 2. Through further reflexive observation in the form of a firsthand narrative (which thus reflects the author's perspectives and biases), the next section describes and discusses how the theoretical process was made real and some of the obstacles it experienced along the way.

To enable the organisational-institutional aspects to be further explored, an actor-network diagram was constructed (Figure 2) and a social network analysis (SNA) initiated (work in progress, therefore not covered in this extended abstract).

3. RESULTS AND DISCUSSION

Invisible technical and organisational complexities were made visible in the co-production of the pilot project and attempted expansion of the social enterprise to other urban agriculture projects, as well as other applications such as community RWH to provide watering water for green infrastructure. The temporal and spatial dynamics of these issues are described in detail in this section and are summarised in Table 1. Despite the landlord and residents of the 'contributor' property being ready and willing, initially complications arose due to a complex land ownership and management structure relating to the land on which the allotments (the 'beneficiary' property) are situated, as the main storage tank for the harvested rainwater was to be located on allotment land. The land ownership and management structure was being negotiated when the pilot commenced, but the implications of potential outcomes were not fully appreciated by the social enterprise or the community group at the time. The main issue was waiting for a decision to be made as to who could approve the installation of the tank on the allotment land.

As the top-half of the actor-network shown in Figure 2 illustrates, the Land Owner and land management organisation (Community Trust) were not the same entity and in addition to this neither organisation managed the allotments (this was undertaken by the Allotment Association) – involvement of these organisations were unanticipated in the original feasibility assessment undertaken. Though some of the individuals concerned were involved with multiple organisations, they were not necessarily responsible for contract negotiation or decision making and therefore both communication and decisions took time to be exchanged and completed, respectively. Due to the uncertainty of the proposed pilot scheme being accepted or not by one or all of the organisations, but not wanting to see the pilot fail due to these complexities, it was decided to persevere and delay installation of the distributed RWH system until they were resolved.

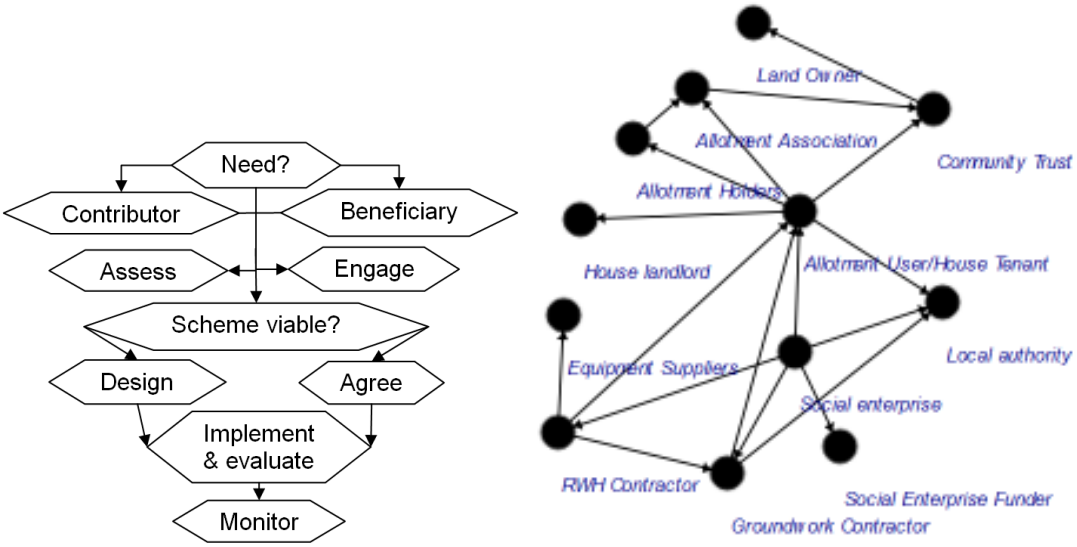

Fig. 2. Flowchart summarising the conceptual project selection process and the actor-network associated with the roof runoff sharing pilot project

Whilst waiting for the land ownership and management complexities to be resolved, attention turned to the status of the narrow footpath mentioned in the previous section and shown in Figure 1. The need for installation of a small conduit beneath the footpath necessitated establishing whether or not it was Highways adopted and therefore effectively the property of the Local Authority. Submission of an enquiry to the Land Charges team at the LA confirmed it was adopted and as the lower half of the actor-network in Figure 2 shows, the number of

organisations involved in the pilot increased further. This was primarily due to the requirement of the New Roads and Street Works Act (1991), which required submitting a Section 50 licence application to conduct work. Additionally, contractors working on Highways adopted roads or paths need to be streetworks accredited and have a Street Works Qualification Register (SWQR) card for both the operative(s) and the supervisor, which must be included in the Section 50 application. Time was spent searching for a SWQR accredited contractor that would accept such a small contract and eventually one was appointed. Negotiations were made with the contractor regarding the cost of the conduit installation, as a limited budget was available and therefore financial issues had to be regularly monitored. The contractor began to liaise with the main RWH system contractor, the residents of the contributor property and the LA regarding the Section 50 licence application.

Table 1. Timeline of activity relating to issue resolution for the pilot project

Timing	Activity	Timing	Activity
Apr *2015*	Initial discussions	Dec *2015*	Received missing form
May	Assessments & engagement	Jan *2016*	Search for contractor
July	Actor/footpath issues	Feb	Contractor appointed
Aug	Land negotiations finalised	Mar	Notice of additional fees
Sept	Footpath confirmed as Highways	Apr	Fee issue resolved
Nov	S50 forms received – 1 missing	June	Full installation completed

The LA declared that an expensive Temporary Traffic Regulation Notice (TTRN) would be required to close the footpath, despite it being a dead end and located on a spur of a crescent by some bollards that effectively made it a no through road. After assistance from a local councillor and the contractor, total fees were negotiated to a level that meant the installation could go ahead. During mid-June 2016 the installation of extra piping, water butts, diverter valves, the under footpath duct, intermediate bulk container (IBC – main storage tank) took place, much to the delight of all involved. Consequently, from initiation to implementation took just over a year. The co-creative relationship between the community and social enterprise has undoubtedly benefitted from collaborative resolution of the issues and invaluable experiential learning gained. However, the extended timescale has delayed the collection and evaluation of performance data. Consequently, demonstrating the concept of runoff sharing to the wider water industry is delayed, limiting current opportunities for wider implementation.

4. CONCLUSION

Co-production between a social enterprise and community group of an innovative initiative to share roof runoff demonstrated complex dynamics, which were explored using an actor-network approach. The interplay between the organisational and technical aspects resulted in difficulties in practice, which although not unresolvable, delayed significantly the completion of the pilot project and the growth of the enterprise. Such difficulties included high fees and delays resulting from land ownership complexities and local authority processes, as well as impeded project evaluation. Further research work will expand the SNA, undertake a project evaluation (performance and practice – data on usage and narratives on if and how allotment holder's activities have changed) and exchange insights with other international community-based water projects.

ACKNOWLEDGEMENTS & COMPETING INTERESTS

Thanks go to the family of actors involved in the pilot project, as well as to UnLtd who provided funding in the form of a 'Do It' award. UnLtd had no involvement in the study design, collection and analysis of data or in the writing of this manuscript. The author drives the social enterprise discussed in this paper, but takes a reflexive researcher perspective and there are no competing interests relating to this work.

REFERENCES

[1] Brown R. R. and Farrelly M. A. (2009). Delivering Sustainable Urban Water Management: a review of the hurdles we face. *Water Science and Technology*. **59** (5), 839-846.

[2] Butler, D., Ward, S., Sweetapple, C., Astaraie-Imani, M., Diao, K., Farmani, R. and Fu, G. (2016) Reliable, resilient and sustainable water management: the Safe & SuRe approach. *Global Challenges*, forthcoming.

[3] Wong, S. and Sharp, L. (2009) Making power explicit in sustainable water innovation: re-linking subjectivity, institution and structure through environmental citizenship. *Environmental Politics*, 18 (1), 18-37.

[4] Ward, S., Brown, S., Burton, A., Adeyeye, K., Armsden, S., Mannion, N., Tahir, S., Gordon, C. and Chen, G. (2016) Water Sector Service Innovation: what, where and who? *British Journal of Environment and Climate Change*, http://sciencedomain.org/journal/10/articles-press.

[5] Seyfang, G., Hielscher, S., Hargreaves, T., Martiskainen, M. and Smith, A. (2014) A grassroots sustainable energy niche? Reflections on community energy in the UK. *Environmental Innovation and Societal Transitions*, 13, 21-44.

[6] UN (2015) 'Water for Life' Best Practices Award 2005-2015: nomination of Isla Urbana for best practices in urban water management.
http://www.un.org/waterforlifedecade/pdf/category_1_isla_urbana_narrative_eng.pdf
Accessed 18-02-16

[7] Adler, I., Campos, L., and Bell, S. J. (2015) Community participation in decentralised rainwater systems: A Mexican case study. (pp. 117-130) In: Memon, F. A. and Ward, S (Eds.) *Alternative Water Supply Systems*. International Water Association, London.

[8] Sustainable Innovations (2014) Rainwater Harvesting: Aakash Ganga – social enterprise for drinking water. http://si-usa.org/projects/rainwater-harvesting/
Accessed 18-02-16