From pioneer to promotion: How can residential waste diversion non-profit organizations (NPOs) best co-evolve in modern China?

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ABSTRACT

Against the background of China's policies to intensify efforts in residential municipal waste sorting, some non-profit organisations (NPOs) have shown that they can make a significant difference in changing residents' behaviours. However, this is a very new policy and implementation context for schemes of tasks, facilities and responsibilities that previously did not exist – even the formal roles for community-level governance officers, NPOs and other stakeholders are still evolving. Here we use a SWOT-PEST analysis to analyse the current operating context of six pioneering NPOs over the last year, to extract generalisable learning to accelerate scaling up as China widens the policies. The results show that the NPOs benefit much from having or establishing a network with the grass-roots level community, and nurturing a positive interaction with all stakeholders: their ability to interface lowest-level government structures with the public was key. The government's support for NPOs in terms of finance or facilities was important, but introductions to stakeholders was crucial. Most NPOs struggled with growing too fast, and insufficient expertise in operational details (such as keeping facilities clean). To be sustainable, they needed more experience in communicating their core goals (e.g. environmental), in terms that the urban planners and funders would appreciate. Non-alignment with current government waste agenda was not seen.

1. Introduction

With the continuous acceleration of China's process to urbanize by bringing rural populations to the cities, the quantity of urban domestic waste is increasing rapidly. The Chinese government attaches great importance to effective waste management, and commenced urban programs of residential waste sorting in 2000 (Tian, 2015). Between 2000 and 2016, several government initiatives were advanced, but the desired results were not achieved owing to lack of public awareness and levels of government supervision (Zhou et al., 2014). In 2017, the government launched pilots in 46 cities to implement compulsory residential waste sorting (or classification), and proposed that by the end of 2020 relevant regulations and a standardized system for waste classification should be established. The government emphasis has gradually moved from setting out guidance documents to mandatory regulations with specifically defined waste classifications including food waste, dry recyclables, hazardous waste and residuals both to recover resources and to reduce residuals which required final treatments.

It has been shown that it is difficult to achieve a significant reduction in the amount of residual residential waste in countries which rely on the singular action of government policy (Patel et al., 2011; Satori et al., 2018). Conversely, when governments involve third parties and community-level organizations such as specialized non-profit organizations (NPOs) there is evidence of improvements in establishing and managing waste collection systems and promoting awareness of related environmental problems (Virginie et al., 2019; Karanja, 2005; Tukahirwa et al., 2011; Oberlin and Szántó, 2011. The Chinese government attaches great importance to the joint efforts of all sectors of society in achieving the goal of waste sorting. A recent report by the Communist Party of China (CPC) stated, "The CPC will… strengthen the system for community governance, shift the focus of social governance to the community level, leverage the role of social organizations, and see that government's governance efforts on the one hand and society's self-regulation and residents' self-governance on the other reinforce each other (The Central People's Government of The People's Republic of China 2017). This quote highlights that the manner in which China develops social organizations is different to many other countries. The governments of many other countries do not go down to the housing

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community level, but the Chinese government does, and thus already plays some of the roles of non-governmental organizations (NGOs) of other countries in the process of facilitating waste sorting.

However, in China, it has been shown that some niche NPOs can be very valuable to work alongside the government to drive forward waste sorting in the residential communities (Dai et al., 2016; Zhao, 2019; Liu et al, 2019; Pien, 2020). The study by Xu et al. (2016) highlighted the usefulness of the NPOs with expertise in environmental behaviour that served as a broker between higher, ward-levels of government, and their community committee, as well as housing associations and volunteers, to co-develop strategies for stakeholder collaborations and responsibilities.

On the other hand, the development of such niche NPOs is uneven in China, as government policy has only recently settled down, and there is no existing formal legal framework for them to work within (Zhang, 2020; Guttman et al., 2018). For example, according to Xu et al. (2016), the roles of the NPO with respect to the two different levels of government committees (ward and community) were not well defined, or able to be well defined, as it was not clear what the relative formal responsibilities were for different partners.

In light of the above literature, this study seeks to conduct in-depth research on six pioneer NPOs to investigate their contextualized successes, difficulties and relative strengths and weaknesses so that generalisable lessons can accelerate the development of further such niche organizations which could make significant contributions to residential waste sorting and diversion in China.

2. Methodology

To analyse the development process of several NPOs in the current policy climate of residential waste sorting in China, we liaised with a funding foundation which supports many, and they introduced us to the five NPOs in their current portfolio, which generally covers all of China and both young and mature NPOs in many sectors. All five were young NPOs carrying out pilots in different cities: Chengdu, Zhengzhou, Changsha, Xiamen and Qingdao. Six structured interviews were conducted, which included one from each NPO. They each specialized in either residential waste sorting or kitchen waste composting, using various approaches of their own devising. We used semi-structured interviews with stakeholders designed for a SWOT-PEST analysis matrix (SWOT: strengths, weaknesses, opportunities, threats; PEST: politics, economy, society, technology) with the capability to provide generalizable information which can be communicated easily for adoption, replication and guidelines for young NPOs in this new policy paradigm of China's waste sorting.

Site visits were planned, but due to the global Covid-19 pandemic, researchers were unable to conduct field research. Consequently, the basic information for each organization was obtained via telephone interviews, and information which we requested that they collate for us (e.g. from the NPOs annual activity log such as work activities, facilities, working conditions, etc.). We designed this data collection for analysis with a combined SWOT- (Strengths, Weaknesses, Opportunities and Threats) and PEST- (Politics, Economy, Society and Technology) framework model, to help understand the development status of each NPO across multiple contexts, and identify the problems encountered and any similarities of processes.

2.1. SWOT-PEST matrix

This study examines diverse organizations in moderately different contexts, with final recommendations to be given for a range of contexts. Therefore, in order to avoid using data collection and analysis tools which would be too narrow, we ensured sufficient breadth to encompass exploratory, and some degree of descriptive results, and for these reasons, the SWOT-PEST matrix was found to be particularly useful. SWOT analysis is a tool that provides a framework for

Table 1

A schematic indication of the comprehensive elements of the SWOT-PEST matrix for capturing many aspects of context. SWOT- (Strengths, Weaknesses, Opportunities, and Threats) and PEST- (Politics, Economy, Society, and Technology).

	P	E	S	T
S	SP	SE	SS	ST
W	WP	WE	WS	WT
O	OP	OE	OS	PT
T	TP	TE	TS	TT

researchers or planners to identify and prioritize the goals of their enterprise, and to further identify the strategies of achieving them (Ommani, 2011). PEST analysis is also a powerful and widely used tool for identifying the changes and the effects of the external macro-environment on an organization's competitive position, and the impacts of external factors are mitigated through pre-emptive strategy (Sammut-Bonnici & Galea, 2015). The combined SWOT-PEST analysis matrix is a comprehensive tool designed to integrate the internal micro environment and external macro environment of the research object and systematically analyse its strengths and weaknesses, as well as the opportunities and risks to be faced, identifying the key influencing factors, and formulating a strategic development plan (Lu and Li, 2016). Table 1 indicates the conprehensive coverage of a SWOT-PEST analysis.

The environmental domain of sustainability is not captured in the SWOT-PEST matrix. However, it is not a focus for detailed examination in this study: ALL of the NPOs have been selected precisely because they have declared environmental goals, and are currently attempting to implement them. At this moment in time the issue in China is more about how any kind of environmental NPOs can become more successful: in the future will detailed analysis as to which approaches make more sustainability impact, be ready for investigation, but at the moment the issue of how self-start-ups can thrive is more critical.

The SWOT-PEST matrix approach has been adopted by previous researchers for similarly complex contextualized analyses. For example, Lu and Li (2016) adopted the SWOT-PEST matrix to analyze a social management scenario in grassroots public culture service to identify the difficulties encountered, and to propose some pertinent strategies. In another study, of the China sports industry, a SWOT-PEST analysis was used to understand the development phases in the context of various regulation and control mechanisms, thus revealing recommendations on the development of the sports industry (Cui et al., 2007). We are thus confident that the use of the SWOT-PEST approach will allow us to quite systematically and comprehensively collect, analyse and compare the scenarios of our NPOs, yielding useful information.

2.2. Qualitative thematic framework for data collection

When using qualitative data-collection it is crucial to use a framework in mind which includes the full range of themes to be covered. In this case we wished to elicit from the NPOs rich information which is likely to be bespoke to them, which makes closed, fully-structured data collection inadvisable and open interview questions more suitable. However, we also did not wish to have such open-ended questions that there would be no consistency across the set of data. We thus took advantage of a framework of 11 domains of residential waste sorting behavioural themes that has already been used and tested in the field, and suggested to be capable of covering all key factors (Dai et al., 2015; Li et al., 2017; Huang et al., 2018). We then used that framework to guide in-depth semi-structured interviewing of key informants (Babbie, 2010). Key informants for each NPO included members of the housing associations, community committees, block leaders, residents, and volunteers.

Table 2

Features of services provided by the six NPOs.

Service type	Label	City	Detailed features of service content
Waste sorting	NPO#1	Changsha	Recyclable and hazardous waste
	NPO#2	Xiamen	All types of waste
	NPO#3	Chengdu	All types of waste
Composting	NPO#4	Qingdao	Decentralized composting + centralized composting, building community composting gardens
	NPO#5	Zhengzhou	Decentralized composting + centralized composting, building community composting gardens
	NPO#6	Chengdu	Centralized composting

Table 3

A sample of data from all themes found in each of the sixteen SWOT-PEST elements, from the interview and activity log data of six NPOs (NPOs #1-3 of waste-sorting' type, NPOs #4-6 of the 'composting waste' type).

	Strengths	Weaknesses	Opportunities	Threats
Politics	1. The business content and scope of social organizations meet the local government's waste sorting and reduction requirements, and it is easy to obtain government support. (All) 2. The local government started waste sorting early)NPO #1, #2, #4(*"In 2017, the effect of waste sorting in our city has been very good…."* *"In order to improve the ranking of cities, our city started waste sorting last year"*	1. Lack of local government's attention (NPO#3, #6) *"… our local government has not fully promoted waste sorting, so residents have limited understanding"* 2. The local government does not carry out the policy sufficiently (NPO#1, #3, #5, #6) *"The local government is just publicizing, but it has not really started to enforce it strictly."*	1. Waste sorting will be implemented across the country (All) 2. Local governments attach importance to waste sorting (All) *"…as the whole country is carrying out waste sorting, so our local government also implemented the sorting at the beginning of the year."*	1. Local governments pursue the speed of waste reduction and focus on superficial problems (NPO#1, #3, #6) *"Many communities just set up sorting bins, but the residents don't really do the sorting."* 2. Lack of perfect legal environment (All)
Economy	1. Stable source of funds from the government (All) 2. Low operating cost (NPO #1, #5) *"Only one employee is responsible for the composting site, so the operation cost is low."* 3. Have a good economic management system (NPO#3, #4)	1. The source of funds is relatively single (NPO#1, #2, #5) 2. High operating costs (NPO#3, #4, #6) *"We need to spend a lot of funds on waste disposal…"*	1. Governments increase capital investment (NPO#1, #2, #4, #5) 2. Benefits from sorting/composting (NPO#1, #3, #6) *"We will collect and reprocess the recyclable waste."*	1. High operating cost would limit organization service scope (NPO#3, #4, #5) 2. Interests conflict between NPOs and stakeholders affect work plan (NPO#2, #5, #6)
Society	1. Early cooperation foundation (NPO #2, #3, #4, #5, #6) *"… and we have an early launch before this program, the residents believe us."* 2. Good relationship with most of stakeholders (All)	1. Lack of publicity towards young group (NPO#4, #6) *"…young groups are hard to mobilized, because they are busy at work and have limited interest on waste sorting"* 2. Poor mobilization of volunteers (NPO#2, #3, #5)	1. The awareness of residents increased with the deepening of publicity (All) 2. More organizations of the same type appear and the influence of pilot NPO is enhanced (All)	1. Lack of supervision (NPO#3, #4, #5, #6) 2. Residents' awareness of waste reduction needs to be improved (All) *"The sorting effect is good with supervision. If not, residents will start to litter."*
Technology	1. Complete facilities (NPO #1, #2, #4) *"After the NPO take over our waste sorting work, they build a new disposal station, add light bulbs, so it's easy for residents to discard waste at night…"* 2. Perfect management system and business operation mode (NPO #2, #4, #5)	1. Poor level of organization management and business operation (NPO#3, #4, #6) 2. Lack of advanced waste treatment technology (NPO#1, #5) *"Now the composting technology is not mature, it will give off a bad smell…"*	1. New technology reduces NPOs' cost (All)	1. Defects in existing relevant technologies (All) 2. Level of site and organization management is low (NPO#1, #3, #5, #6)

3. Results

All six NPOs involved in this study have been working with a local community for at least one year, and the data collected spanned the period from January 2019 to December 2019. The characteristics of their services are summarized in Table 2.

3.1. The results of the matrix analysis of the six NPOs

The data from the semi-structured interviews from each organization were transcribed, and their data then coded by two independent researchers, as well as the logs of activities, with respect to the defini-

tions of the 16 elements of the SWOT-PEST analysis matrix. The results are summarized in Table 3.

3.2. Key strengths, weaknesses, opportunities and threats of six NPOs

The data showed that NPO strengths emanated from the government's strong support for the NPO work, the stable source of funds from the government, and the ease this provided to develop good relationships with the stakeholders. Weaknesses were commonly due to the NPOs being new and/or inexperienced in organizational management, and their high reliance on local government cooperation while that body might have other areas of focus. All the NPOs reported abundant opportunities for high publicity, expansion opportunities, and investment

and capital input by government, due to the national government still building capacity in waste sorting. However, this also provided the main threats: lack of clarity of roles and responsibilities by stakeholders generally, and some competition and tensions between them while adjusting to the new policy environment.

4. Discussion

The SWOT-PEST analysis system provided a sound basis for understanding several aspects of the NPOs' development that were important for future young NPOs to learn from.

4.1. Stakeholder engagement and government introductions

It is noteworthy that those NPOs which actively involved stakeholders (in the collaborative work regarding waste sorting) were reporting stronger achievements. For example, NPO#2 and NPO#4, actively worked with ward-level government and landlords and maintained good communication and cooperation with neighbourhood associations. Through these processes, the stakeholders are able to learn strategies to influence residents and to expand the impacts to a bigger group: they are themselves empowered to act. In addition, NPO#2 was able to leverage local resources and residents, e.g. as volunteers. In contrast, NPO#1 did not have close enough cooperation and communication with the residents, and only achieved modest waste sorting results for their community.

Although it seemed important that the NPO had a strategy to involve and engage stakeholders, it was also clear that the process was made much easier in the cases where the local government made many introductions, and made clear the roles, either formally or informally. Appropriate involvement of local leaders like major landlords, communist party members, and government-appointed supervisors made a difference to how smoothly the work could proceed.

It is also noteworthy that every one of the NPOs was working very closely with local government at the community level: even in cases where those bodies were not focused or interested in the topic of waste sorting, the NPOs were interacting with them in order to achieve their goals. This is important to note, because it signals that the current niche role for NPOs in our China cases seems to be as a broker who can bring added value to government policy at the level of public interface and specialized public mobilization (in waste sorting). This is quite different to the idea of NPOs leading their own agenda.

4.2. Merits of NPO connections with grass-roots networks

All NPOs which had or developed a good relationship with grass-roots networks of residents often achieved early cooperation with the target community, which was necessary for getting the residents to engage in waste sorting. With the exception of NPO#1, all NPOs had prior collaborations and ties with the project community, and both sides had already cultivated a certain working understanding. This also created a foundation of trust for the subsequent full-scale rollouts of sorting and recycling programs.

NPO#5 had organized a couple of community activities including a series of training events and hands-on practice, which increased residents' awareness of waste sorting. It also strengthened partnerships with residents that would then often participate in NPO activities, actively respond to calls to duty, and contribute to the wider promotion of waste sorting. In the NPO#6 scenario, composting actions were integrated with other voluntary service activities, which immensely expanded their influence. NPO#4 had extensive prior involvement in local networks, including development of a system of multiparty deliberation by residents' organizations, which provided a very solid foundation to elicit input for new developments. NPO#2, NPO#5 and NPO#6 also had prior collaborations with the community- and street- level governments,

which seemed to naturally facilitate their new role in this waste sorting project – preventing barriers which might have otherwise arisen.

4.3. NPOs need to learn to make a strong case for their goals

The composting-service type NPOs were often confronted with problems relating to high cost of their very localized operations. Although the government would provide some start-up funds, the reality was that this localized approach was intrinsically more expensive than centralized composting, and would never compete. On the other hand, it produced much more involvement by residents, and possibly strengthened a sense of community. It was noted that the NPOs responded by 'hoping' that the government would still fund them in the future, but this could also be interpreted as a clear need of those NPOs to learn to make arguments in terms that the government bodies can understand. In other words, they needed to learn to make their own case for their goals, which might have a different basis – e.g. environmental interest rather than waste-diversion interest.

4.4. Importance of interfacing residents with appropriate facilities

With respect to facilities, NPO#1 has a well-developed waste processing facility system (including sorting, transportation and final disposal, treatment or recycling), but the end result fell short of expectations owing to lack of communication with residents – it was too contaminated, and residents considered the facilities dirty. NPO#3 facilities on the other hand were not well developed, which directly affected the residents' sorting experience and thus lowered the participation rate. These examples indicate that the NPOs need to carefully interface their facility types to their communication approaches to residents. NPO#2 had three constructed sorting sites which included convenient and appropriate facilities with good results: an example of what can be achieved.

5. Conclusion

This study analysed data from case studies of six NPOs in 5 pilot cities in China which specialize in residential behaviour of waste-sorting or composting, to extract useful information about any key specific aspects of their development under the new policy paradigm of waste sorting in China. It was found that the NPOs had obtained important support via the government, because waste sorting is a current priority for capacity building across the country. This included key support for staffing, some facilities, and implicit introductions to relevant stakeholders. The newness of the policy meant that all the NPOs had extensive opportunities in principle to develop their approaches, and expand and publicize if they wished to.

Some key lessons across the six NPOs included the importance of strategies for effective engagement of collaborating stakeholders, which was facilitated in cases where government bodies made introductions. This was enhanced where the government bodies also clarified roles of stakeholders. It is noteworthy that all the NPOs were local, Chinese, and had found a niche in interfacing between government bodies and the general public – but always were aligned with a current general priority of the government, i.e. waste sorting. The more successful ones had, or created, stronger links to community networks and residents, and this ability to leverage impact on the ground was key to their success. Most of them struggled at least a little with managing organizational changes and growth with their new projects, where their inexperience showed. Other areas of hindering inexperience included scaling up and/or operational details such as keeping facilities clean, and very careful interfacing of instructions to residents with the facilities being used (both well-known by waste managers). In some cases, it seemed more experience in preparing arguments to justify their core goals (e.g. environmental concerns) was needed, in terms that the government and/or other potential funders would appreciate.

China plans to achieve the goal of normalizing the sorting of urban waste in pilot cities during 2020, and then scale out to other cities. Therefore, NPOs are faced with a good policy dividend, and there is room not only for their expansion but also the entry of new actors in the field. Despite the lack of such NPO types in the past, or clear legal frameworks for them to work under, the next few years can provide ample space for new NPOs to develop, and perhaps branch out to other government-public-interfacing niches. The findings in this work can help define the space they are useful for, and which they can prepare for.

Limitations

Due to the impact of the COVID-19 pandemic, the investigation was carried out remotely rather than via field visits, so there was a lack of interviews with residents, and the information obtained was more limited than planned.

Declaration of Competing Interests

⊠ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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