Drift in policy implementation: incentives thwarted in a recycling program

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Abstract

An incentives-based residential recycling program was designed and implemented for improving residential waste sorting in Shanghai City, but showed very limited success in its performance. To identify *why*, this study systematically analysed each step of implementation using key informant interviews and site observations. Results show that policy intentions were retained in the policy devolution processes from Municipality to District, and then to Street (ward) levels, but the incentives concepts were effectively nullified in the further devolution to Community Level governance. The local implementers focused on formal KPIs in order to satisfy inspections. However, the KPIs, which had been devised to allow ease of measurement, were found to unintentionally cause divergence from the policy intention of incentivisation of residents. Furthermore, high scores for these KPIs masked the implementation failure. This identification of the effective de-railing of a policy via conscientious implementation is worth highlighting for avoidance in other programs, in recycling or elsewhere.

Keywords

Incentives, Green Account, subsidy, waste sorting, food waste, decision-making, waste policy

Introduction

Background to residential waste issues

   With urbanisation and industrialisation, the rise of municipal solid waste (MSW) has become an intensified and urgent problem. Household waste sorting is one of the most effective ways of addressing the MSW challenge (Huang et al., 2014; Tai et al., 2011). Globally, there have been different approaches established by city governments to facilitate household and/or community-level waste sorting and reduction. These include regulation enforcement, co-operation between government and organisations, community involvement, intervention programs, financial investment, and public education (Huang et al., 2014; Lee & Paik, 2011). Waste sorting clearly requires the involvement of residents, and programs aimed at the promotion of sorting certainly requires extensive community-level mobilisation and engagement. According to Suttibak and Nitivattananon (2008), the process of setting up a structure that motivates all relevant stakeholders to continuously conduct waste sorting and reduction generally requires a certain degree of financial stimulation and investment. This can be in the form of provision of adequate infrastructure, incentives, subsidies, public education or financial and/or technical support to community managers. Many countries have advanced policies which enable financial stimulation and investment to facilitate community recycling (Shekdar, 2009), but there are limited analyses of implementations of this approach.

   China began to engage in waste collection in the mid-80's and started exploring avenues for waste classification in 1995, but urban residential waste sorting programs mostly commenced in 2000 (Tian, 2015), and a national campaign was launched in 2017 (GOSCC, 2017). Over recent years, several government programs have been developed, but despite all of these efforts, the desired results were not yet achieved, reported by some as being due to a lack of government oversight and of public awareness (Zhou et al., 2014). Shanghai City was one of the earliest pilot cities (Tian, 2015) to develop a small incentive-based program in 2009, with larger pilot communities from 2015 and full city coverage (available but not mandatory) in 2016. In more recent years, the government's focus was food (wet) waste recycling (SLCAAB, 2020).

   The incentivisation of residents as a policy instrument for motivating residential recycling has been pursued at various times in many cities worldwide, and results show that they are sometimes effective and more often ineffective (an overview is provided in Li et al., 2017), although most studies only report on very short-term results. DEFRA (2007) in the UK found that rewards are generally well received by the public and are more politically acceptable than penalties. Short-term studies conducted in the UK revealed that incentives could be highly effective in increasing participation rates and/or frequency and regularity of participation, and in reducing contamination (Harder & Woodard, 2007; Timlett & Williams, 2008). On the other hand, incentives require an effective service delivery and communication in order to have effect (Maunder, 2006). Concerning durability, Vining and Ebreo (1990) postulated that incentives could lead to residents starting to recycle but they would later return to previous habits. A rare study of a large-scale, long-term (2-3 year) incentives program in Nanjing showed that it could, alongside social influence effects, achieve around 30% participation rates, but was

deemed financially unsustainable by the authorities (Li et al., 2017).

Recent studies have reported that Shanghai's residential incentives waste recycling program was not working, without identifying *why* (Wang & Zhang, 2018; Ye, 2016). Some researchers suggest that incentives programs need to be made mandatory, in order to achieve effectiveness (Qian, 2019). Others argue that to be effective, incentives programs should include not only material rewards, but also spiritual or moral satisfaction (Wang & Zhang, 2018; Wu, 2018; Ye, 2016). Studies of the ineffectiveness of such programs include questions about the usefulness of incentives to individual residents, compared to their usefulness to the end-of-the-line employees such as cleaners (Wu et al., 2016; Xu et al., 2015). This study explores the intrinsic cause of the ineffectiveness of Shanghai's Residential Waste Sorting Incentives Program, using, first, a scoping pre-study, and then a city case study approach, where every stage of evolution of the policy implementation is investigated, from policy publication to final delivery scenarios.

Background of Study

The Shanghai residential waste sorting program involves a two-step procedure: primary and secondary sorting. In the primary sorting, residents are expected to sort their waste at home and deposit it, separated, in the community's designated waste bins under the friendly supervision of waste sorting assistants. The secondary sorting takes place if and when the waste deposited by the resident is not actually well-sorted, when 'second sorting' by the community cleaner is necessary before the pick-up service. The Shanghai Incentives Program was delivered via the Community Committees of the city's residential compounds (typically containing 200-5,000 families), and includes two incentives routes: the Green Account (GA), and the Cash Subsidy (CS). The Green Account is designed to directly reward residents for correctly sorting and depositing waste via 'green credits' available twice-daily (up to 20 credits per day) and recorded onto 'smart-cards' credit assigned to each household. The green credits are later exchanged for household commodities (Wu et al., 2016), which are available through either the GA website (supervised by the Municipal government) or annual community exchange-events (supported by third-party non-governmental organisations (NGOs), or private companies). The policy intention of the GA is to encourage residents to adopt a 'producer obligation' attitude towards sorting and to form sustainable sorting habits (Huang et al., 2016). The second route, Cash Subsidy (CS), is a supplementary government fund designated for the recruitment, training and basic allowance for GA card-scanner personnel and volunteers who scan the cards twice daily. It also includes cash subsidies paid to community cleaners for their secondary sorting of impure waste, and the amount paid is determined by the number of low-contamination food (wet) waste bins collected and documented by the waste transportation service (Wu et al., 2016).

The Shanghai Government Incentives Program thus clearly incorporates several detailed steps to implement its intention to incentivise residents. However, a preliminary, scoping study for the investigation reported here showed there were difficulties in the program. For three months (July to September of 2019) we conducted stakeholder interviews and non-participatory observations with key informants from a convenience-

sample of thirty communities across Shanghai. The purpose was to scope out what was happening on the ground in an exploratory sense and looking for saturation of concepts, not for descriptive statistics. It was surprisingly found that several inconsistencies existed between the program's concept and its actual implementation, which are summarised in Table 1. Basically, residents were usually being allocated points without any link to their performance.

Table 1. Lessons from a preliminary scoping investigation of the Shanghai waste sorting Incentives Program from a convenience sample of 30 communities.

Observations:
- Only elderly residents claimed GA credits in the morning time-slot for depositing waste.
- Only elderly residents turned up at the credit exchange events to trade for commodities.
- GA card-scanner personnel generally swiped any cards presented to them by residents, without checking the quality of the sorted waste or ownership of the card.
- Some volunteers and cleaners would take over the waste sorting and depositing actions from the residents while manning the bin sites, which is unhelpful for residents to form sorting habits.

Interviews:
- Many residents simply left their GA cards permanently with the GA card-scanner personnel to obtain daily credit claims, and would not retrieve it unless an exchange event was approaching.
- Most Community Committees claimed (proudly) that they had centrally-registered the GA cards for all residents, not understanding the government's intention that residents should voluntarily register for themselves.
- Some Community Committees kept the GA cards in their office, and simply allocated GA credits onto them regularly without involving the residents (or any sorting) at all.
- Cleaners complained that the secondary sorting was too much of work, and preferred to sort at the moment that residents came to deposit their waste.

After learning from the scoping study that the practices summarised in Table 1 were – at least sometimes - taking place, the main investigation in this paper was designed to understand in detail *how* such a simple concept – incentivisation – could have been modified so much during its implementation steps, that it seemed to have no actual incentivization attributes at all for the residents by the time they were involved. And this, in an environment where the implementers seemed determined to do a good job: there seemed to be nothing but cooperation occurring along the implementation chain. To achieve this, this study systematically mapped out and analysed the entire implementation process, from the initial city-level decision-making stages, through the top-down hierarchical devolution of set targets and key performance indicators (KPIs), and thus to community-level implementation.

Methodology

This study adopts a case-study approach, with boundaries at city level, to systematically investigate the implementation steps of the Shanghai Incentives Program, including each decision-making stage, through the hierarchical devolution of set targets and KPIs, down to the community-level implementation in the field. A case study approach is the most suitable because although it was known from the scoping study that significant deviations from the policy intention take place somewhere in the system, it was not clear how, nor where the drivers come from. Thus, there was no *a priori* factorization of the problem, but rather a 'whole system' of the city's case to be investigated.

This study was thus conducted in the following sequential phases: (i) a review of policy documents (to extract the municipal government's intentions, targets and KPIs); (ii) interviews of Key Informants who have knowledge of the intermediary stages of implementation at the District and Street levels; and (iii) field work to capture the nature of the final implementation (comprising interviews of community-level stakeholders, and site observations).

In order to chose suitable Key Informants, the key stakeholders needed to be mapped out. They fall under two broad categories: the decision-making hierarchies, and a third-party NGO (Figure 1).
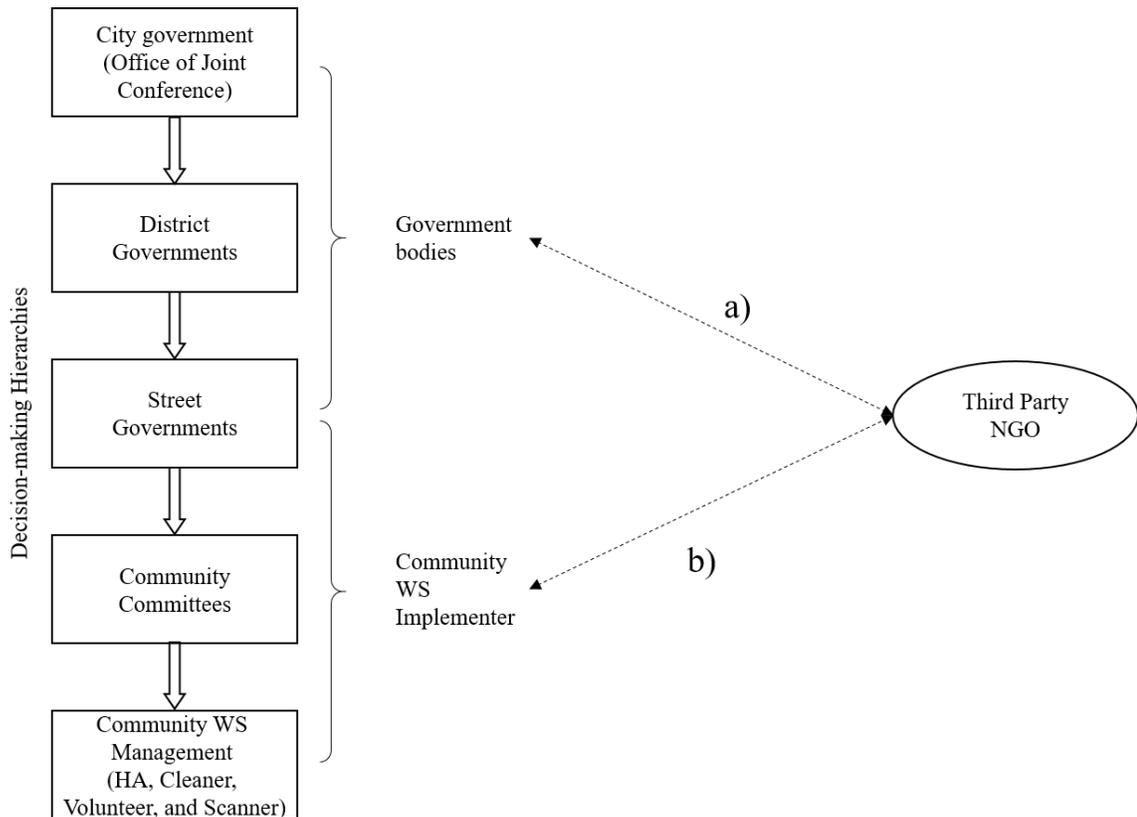
Figure 1. Decision-making stakeholders involved in the Shanghai Incentives Program. The third-party NGO interacted significantly with both the government

bodies and the community-level practitioners over long periods of time, and thus was used as the main Key Informant. Note that Residents are stakeholders, but not decision-making ones, and thus not shown.

Decision-making hierarchies include the government bodies (City, District, and Street governments) and the community-level implementation stakeholders (Street-level government, Community Committees, Housing Associations, volunteer supervisors, GA card-scanner personnel, and cleaners). Note that the Street-level government has a role in both: the bottom of the formal government stakeholders, and the top of the community-level stakeholders. Each level of government hierarchy set the targets and KPIs for the next-lower body at each level, culminating in inspections of the KPIs of the community-level implementation performance. The Community Committees (CC) act as the bottom-level liaison between formal government and residents, and are intended to serve as residents-oriented self-managing committees (although they are appointed by government, not elected). The Housing Associations (HA) are business-oriented and mainly provide estates-management services to residents. Individuals such as volunteers and cleaners are also considered part of the waste sorting management team in this study. Lastly, the NGOs are contracted by government to leverage their community-based waste sorting expertise, to facilitate the implementation process of the incentive's program at the community-level. These roles are illustrated in Figure 1.

A Chinese third-party NGO was selected as being most suitable to be a main Key Informant source for the following reasons: they have existing, long-term, contractual, collaborations and co-operation with the government in waste-sorting related programs, and possess a deep understanding of government's intentions; they cooperate with all stakeholders and serve as intermediary between them which demonstrates significant understanding of the community implementation process; and their position of neutrality should enable them to provide trustworthy comments. It was decided not to interview government hierarchy officers as Key Informants, because preliminary attempts found that the information they provided was identical to the policy documents, and they professed not to have experience of what was actually happening on the ground: they were thus deemed unsuitable for this purpose. In order to allow for richness of information to emerge, we adopted in-depth semi-structured interviewing approach for Key Informants (Babbie, 2010). Interviews were conducted with three staff members of the NGO with different responsibilities having direct access to the operations of the incentive's program: contract manager, community waste sorting practitioner, and GA data keeper (details in Table 2).

Table 2. Basic background of Key Informants chosen, and themes of the respective interview questions

Interviewee Roles		Area of expertise	Theme of Interview questions
1	Contract Manager	Contract details (what government	Government's intention; targets

		wants and requires) and the 'big picture' of Incentives Program	breakdown; requirements or KPIs; Incentive Program
2	Community waste sorting implementer	Community implementation of waste sorting and Incentive Program	Adaptation of incentives; performance of incentives; attitudes of residents
3	Green Account data keeper	Data of green account and other incentives	Incentive KPIs; completion of KPIs

Results

Stakeholder details

The Shanghai City government is responsible for waste sorting related policy-making, and these policies were found to be publicly available. From these were extracted the Incentives Program's city-level intentions, targets, implementation plans, and KPIs, for both the GA and the Cash Subsidies (CS). The actua*l implementation steps* of these policies - at each level - were then investigated through Key Informant interviews, with the themes given in Table 2.

Details of the *final delivery* of the policy were obtained via community-level stakeholder interviews and site observations, using the themes given in Table 3.

Table 3. Key expertise and, questions themes asked, of the community-level practitioners (Key Informants for expertise).

Stakeholders	Expertise and Responsibility	Theme of Interview questions	Number ppl interviewed
Waste sorting obligation			
Residents	Primary sorting; GA credits claims, and exchanges	Whether they directly control use of the GA card; whether they think it's their role to sort waste or the cleaner's role	4
Waste sorting assistants			
Cleaner	Secondary sorting; Waste bins/stations maintenance	Subsidy payment; daily work; waste sorting assistant related work	1
Volunteer	Assist primary sorting by educating and	Subsidy payment; shift schedule; assistant-related	1

	persuading	work	
Card-scanner personnel	GA cards scanning	Subsidy payment; GA usage of residents	1
Management teams			
Community Committee	Community implementation planning and executing; Volunteer recruiting and training	GA implementation detail; volunteer and card-scanner personnel arrangement; upper level requirements/evaluations	1
Housing Association	Community implementation planning and executing; Cleaner hiring and training	GA implementation detail; cleaner arrangement; company requirements and waste sorting evaluations	1

This data collection was conducted in fifteen communities, to complement the interviews with the NGO members and to allow a triangulation of understanding of the final delivery scenarios, by considering different data sources to achieve a saturation of concepts. The intention was to elicit rich information concerning personal experiences about the final policy delivery from several key local stakeholders, and for this, open interview questions are the most suitable (Babbie, 2010). Consistency was achieved across the sets of data by using the same semi-structured format for core questions, and in-depth open interviewing to achieve detail where needed (Babbie, 2010). The questions for each stakeholder category were tailored according to their respective roles in each community waste sorting and incentives implementation process (see Table 3). In each community, interviews were conducted with one person from each of the other stakeholder categories, and four residents from a convenience sample. Representative sampling of the residents was not intended nor required for our purpose of identifying (not quantifying) final delivery scenarios. However, given the opportunity, we did choose the fifteen communities randomly from a complete list of 227 communities serviced by the NGO.

Resulting information on each implementation step
Figure 2 shows a schematic of what the data generally indicated on the related processes of how decisions were made, and targets were devolved, down through the steps of decision-making hierarchies. The City-level government initiated the Incentives Program policy and passed it down to the various District governments for further implementation in the form of set targets and KPIs, which were designed to be pragmatic for ease of monitoring and evaluation (given in detail in Table 4). Each level made decisions for the next-lower level implementation of this, setting out requirements of new targets and KPIs – which differed from level to level and reflected their each specific political and operational context (Figure 2).
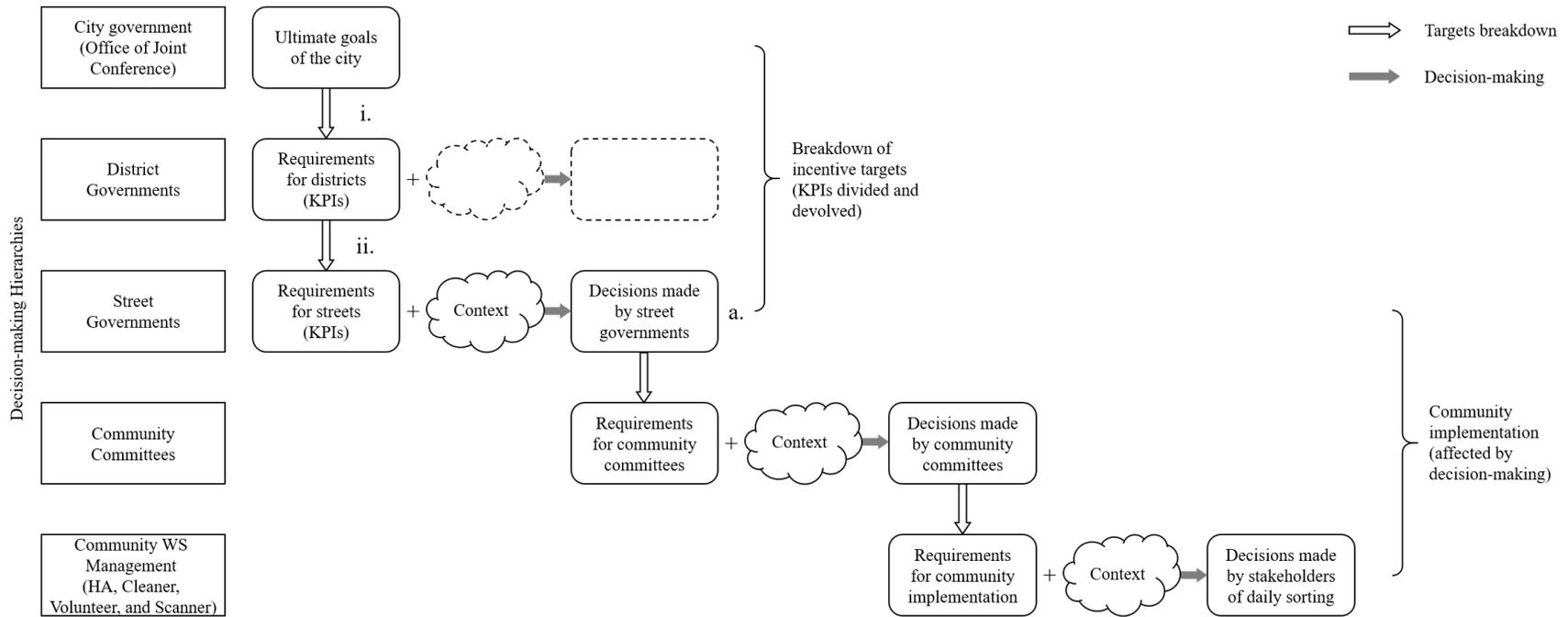
Figure 2. A schematic of the flow of impacts made along the decision-making hierarchical processes. The 'Context' cloud denotes that each level of government made its decisions not within a vacuum but within a 'Context', dominated by certain aspects desired by superiors in the level above.

Table 4 gives full details of the results: the key decisions made at each level and the context dominating their choice. The City government avoided making detailed plans and instructions, or participating directly in implementation, but instead encouraged lower-level bodies to come up with innovative plans suitable for their own domains (Zhu, 2013) – sometimes resulting in variations differing right down to the community level. At the same time, each body set its own targets and KPIs, with accompanying evaluation methods (e.g. multi-level inspections), expecting these to improve the effectiveness of policy implementation and guarantee good performance of actual waste sorting. From a municipal waste management viewpoint, localisable targets and KPIs are necessary for bridging the gap between top-level management and bottom-level practice. They are considered useful in providing clear communication, and effective evaluations.

Table 4. A key summary of the data on decision-making contexts and processes, at each hierarchical level. Decisions are made according to the requirements from upper-level government, and in their own operational contexts: these then define the new requirements for the immediate next lower-level. [PR]: policy review; [KII]: Key Informant interview; [CISI]: community-based implementation stakeholder interview; [SO]: site observation.

Decision-making Hierarchy Body	Requirements of Role (Delivered from the level above)	Context that the body operated in.	Decisions made and passed down to next level
City Government	1. Establishment of laws, regulations and standards [PR] 2. Formation of promotable household waste sorting (WS) mode [PR] 3. As one of 46 pilot cities, the recycling rate of household waste should exceed 35%. [PR]	1. One of the 46 pilot cities. [PR] 2. Believe incentive approach would motivate residents towards forming sorting habits and improving sorting results. [PR]	1. Apply incentive-based approach [PR] 2. Provide funds for incentives [KII] 3. Set up and devolve GA registration (KPI) for each district. [PR] & [KII] 4. Shift focus from registration rate, to credit claim rate, then to credit consumption rate between 2015 to 2019 [KII] 5. Set criteria for WS performance inspection and ranking [PR] 6. Inspect community-based WS results and particular KPIs. [PR], [KII] & [CISI] 7. Encourage the involvement of third-party NGOs in WS implementation [PR]
District Government	1.Achievement of GA related KPIs devolved by City government [PR]	1. One Street may be in a better position for implementing WS over	1. Divide and devolve GA related KPIs for each Street Government [KII]

	2. Community-based WS performance [PR] 3. Other WS criteria or targets devolved by City Government [PR]	another (e.g. financially) [KII] 2. Limited expertise and time [KII]	2. Sign contract with third party NGO (Including GA related KPIs and WS implementation targets) [KII] 3. Subsidy allocation to cleaner, GA card-scanner personnel and third party for hosting exchange event [KII] 4. Inspect community-based WS results and particular KPIs [KII] & [CISI]
Street Government	1. Accomplishment of GA related KPIs devolved by district: registration rate, credit claim rate and credit consumption rate [PR] 2. Community-based WS performance [PR] 3. Cash subsidy payment [PR] 4. Other WS criteria or targets devolved by District government [PR]	1. Unclear about implementation details [KII] 2. Performance varies depending on the top leader (Street Secretary): understanding ability, general competence, other political interests and level of commitment [KII] 3. May be occupied with other prioritised duties [KII]	1. Make outline plans for community implementation [KII] 2. Give flexibility to Community Committee, but expect them to accomplish KPIs by schedule [KII] 3. Overlook certain shortcuts taken by Community Committee (e.g. registration for all households) [KII] 4. Inspect community-based WS results and particular KPIs [KII] & [CISI] 5. Pay cash subsidy to cleaners and GA card-scanner personnel [PR]
Community Committee	1. Publicity of GA program 2. Accomplishment of GA related KPIs devolved by Street government: registration rate, credit	1. Acts as the liaison between government and residents, thus, in a difficult position balancing both party's desires [KII]	1. Make more-operable plans for community implementation [KII] 2. Register GA for all households [KII] & [CISI]

	claim rate and credit consumption rate [KII] & [CISI] 3. Volunteer recruitment and training [CISI] 4. Community WS implementation [CISI] 5. Sorting results [CISI] 6. Other WS criteria or targets devolved by Street Government [PR]	2. Performance varies depending on the top leader (Street Secretary): understanding ability, general competence, other political interests and level of commitment [KII] 3. Limited time and man power [CISI] 4. Would be rewarded (in millions of Yuan - ¥) if demonstration standards are achieved [KII] 5. Would receive a reprimand from Street government if ranked at the bottom three [KII] & [CISI] 6. Do not want to excessively bother the residents [CISI] 7. Trying to maintain a cordial relationship with residents [CISI]	3. Permit GA card-scanner personnel (cleaner/volunteers) to hold GA cards for households and scan them on a daily base [KII] & [SO] 4. Collect GA cards from residents before exchange event, and exchange goods on their behalf [SO] 5. Checking of sorting result [CISI]
Community WS Management (Housing Association, cleaner, volunteer and card-scanner personnel)	1. HA is responsible for cleaner hiring and training [CISI] 2. HA have to ensure good WS result [CISI] 3. Cleaners should ensure waste in bins are not mixed before pick up [CISI]	1. Residents have become less interested in GA once they formed WS habits [KII] & [CISI] 2. Exchangeable goods of GA only attractive to older generation [KII], [CISI] & [SO] 3. Inspections are from multiple parties and unpredictable, creating a lot pressure for community management team (CC and HA) [KII] & [CISI]	1. GA card-scanner personnel stands by bins, and scans cards for residents whether they sort or not [SO] 2. GA card-scanner personnel (cleaner/volunteers) holds dozens of GA cards for households and scans them on a daily basis [KII] & [SO] 3. HA persuades cleaner to do a good sorting job and check bins for contamination periodically [CISI] 4. Cleaner or volunteer assists in

4. Some residents do dump mixed waste into bins if they are not watched [CISI] & [SO]
5. HA would face punishment if waste bins were found contaminated: Bins will not be picked up and ticket requesting rectification of problem [CISI]
6. Cleaner/scanner's subsidy would be deducted if inspection results are bad: Presence of contamination and low GA credit claim rate [CISI]
7. Cleaner prefers assisting in primary sorting than conducting a secondary sorting, which is very irritating [CISI]
8. Try to maintain a cordial relationship with residents [CISI]
9. Do not want to irritate residents [CISI]

residents' first sorting, sometimes takes over [SO]

Analysis

The data was analysed within each decision-making hierarchical level. At the municipality level this only involved the review of the policy documents, but at the other levels it involved the data from the NGO and practitioner interviews as well as observations. After considering the data in detail, and examining how the final scenarios on the ground evolved, it became clear that the form in Table 4 would best communicate our findings, reflecting Figure 2. For each hierarchical level we outline the 'message received' from the level above; KPIs given; context; and decision made – and passed on to the next-lower level.

The analysis showed that the devolution of the set targets and implementation plans did not lose the original concept of the Incentives Program at the higher levels: it was preserved from Municipality down to District, and from District to Street level. The nature of the targets and KPIs devolved therein have no derailment of the Incentives concept: there is no contextual element, or driving KPI, which nudged or compelled the decision-making away from the incentivisation of residents (see process i. and ii. in Figure 2). But within the flexibilities which were allowed for decisions regarding targets and KPIs, a divergence begins to happen, starting from Street level (see process a., b. and c. in Figure 2), and there is indeed evidence for loss of the original Incentives Program concept by the end, at delivery.

In order to pinpoint the unintended derailing of incentives concept, it was necessary to analyse each decision-making process with respect to, and in the context of, the levels above and below. Noteworthy is the dual-function of the Street level government as a government body and also a community-level implementation stakeholder in the decision-making hierarchy (Figure 1 and 2), and which also works closely with third-party NGOs in terms of implementation planning (for lower levels) and reporting of inspection results (to higher levels). Therefore, the decisions made by Street government on how incentives should be applied have a very direct impact on final delivery practice. However, it was found that there were considerable tensions regarding how to deal with pressures coming from higher-level government at the same time as pressures from members of the public. The officers seemed keen to develop the simplest result-driven approach that could possibly guarantee their required KPIs, and minimise the irritating of residents. It seemed likely that in some cases, personal-political interests in getting promotion, or making the team look good, or avoiding punishment, dominated decision-making much more than other contextual elements. It could then be more easily understood how some local decisions could be made, such as paying more cash subsidy to cleaners - rather than engaging more with the residents which was time-consuming and could cause complaints against them. Or allowing 'grey areas' in interpretations concerning how performance results were documented, or green credits given out (see process a. in Figure 2) – which resulted in credits being given out uncorrelated to performance.

Among the decision-makers dominating implementation stages, the Community Committee plays a key role as a liaison between community-based policy and resident-level implementation. Since the Committee chairpersons are actually considered government officers, the committee functions more as a direct driver of government policy than as resident representatives. Though not mandatory, the committee leadership is expected to directly assist the Street government to meet its set targets, and will receive either a reward or reprimand depending on the community's actual performance (Table 2). For these reasons, the Community Committee choses its course, and the analysis shows that this results in less emphasis on the actual intentions of the Incentives Program – the incentivisation of the residents. However, the Community Committee also must maintain a

decent relationship with residents, which is vital for daily work in running the community. Taking seemingly-innocuous shortcuts is possible to avoid irritating any residents, is where the practice of interpreting KPIs slightly differently becomes the natural way forward: centrally registering residents onto the GA smart cards without involving them; permitting the GA card-scanner personnel to scan cards without checking the waste sorting quality; and exchanging goods on behalf of the residents. These actions were found to be quite normal in many Community Committees, as examples of conscientious service. At the next level of government – the Street level – such practices are often given leniency and implicit approval, as long as the formal KPIs look good. The Street officers know that the work at the community level is arduous and tricky dealing with residents, and like to provide latitude when they can.

Similarly, the Housing Associations in each community serves as a direct management body, but is not answerable directly to any government office or even to the Community Committee. They strive to achieve good waste sorting performance, but only face consequences at the end of contracted periods, when new contracts are negotiated, which could be many years. They are usually responsible for recruiting and training of cleaners, and overseeing cleanliness of the community and recycling waste stations. With the advent of community-based waste sorting their workload has suddenly increased, and they are suddenly subjected to periodic, unannounced, inspections by the government, or the third-party NGO which reports to government. From their point of view, the Housing Associations would rather not rely on the residents' complex behaviour, or enter into complex relationships with residents, but simply make arrangements with the *cleaners* and find ways to encourage them to perform secondary sorting. The extra cost was able to be mitigated in some communities by allocating the cleaner to be the 'GA card-scanner personnel' in addition. This arrangement created many 'grey areas' that the Housing Association was not driven or inclined to be concerned about: GA cards might be scanned for residents whether they sorted or not, and even universally for the whole community, every day. As long as the KPIs were produced, the HAs could feel they were doing a good job: green points were awarded, and uncontaminated waste was ready for pick-up. The fact that residents were not sorting the waste was immaterial to the implementation, from this perspective.

Discussion

This study has revealed the main reasons behind the loss of the incentive's original concept and intentions. The downward devolution in the decision-making stages - especially from the Street level to the community level - did significantly contribute to altering the original concept at each stage that new targets and KPIs are set, leading to the loss of the original intentions of nurturing sustainable sorting habits amongst residents at the community level. It was greatly driven by an underlying desire to have KPIs which were pragmatic: they had to be simple to set, and evaluate. But in focusing on these characteristics for the KPIs, the 'incentives' program naturally drifted away to a focus on 'pragmatic monitoring' instead. This caused some interesting side-effects: the intended improved recycling performance resulting from incentivised residents did not happen, but KPIs were created along the chain of implementation which could be easily returned with high scores. The program thus appeared to be successful but actually did not achieve its aim. It showed high KPIs, yet only achieved low-level and contaminated recycling materials. The "drift" of the emphasis of the policy, from its simple conceptual beginning concerning 'incentives', to its final one in the field of 'KPI-maximisation', is likely a potentially common phenomenon in multi-level governance, which merits being explicitly pointed out, planned against, and avoided - in any

kind of policy.

This study can confirm the observations of Wu et al. (2016) who commented broadly on the apparent irrationality of top-down subsidies making their way to cleaners to sort waste after residents make unsorted deposits. Cleaners are often willing to carry out such work because of their low insecure amounts of pay. The CS subsidy payment only motivates *the cleaners* to do a better sorting job themselves, rather than supporting *the residents* to accept their producer-obligation (Wu et al., 2016). The findings here show that such actions will achieve good community-level KPI results as needed for inspection purposes – not as a purposeful deviation but certainly as an effective one for inspections. But also, one which will defeat the original concept of the incentivisation of residents, and thus of nurturing a sustainable habit towards waste sorting. Even after funding the program for several years, when the subsidies that can be diverted to the cleaners are stopped…the waste sorting will stop, because the residents have not learned a habit.

This study also clarifies why the 'Green Account' program in Shanghai was not identified as failing, for such a long period. It seems that the very KPIs that were set up to monitor it were flawed, but they reinforced each other. For example, if the KPI concerning the 'number of residents registered on the scheme' was inadvertently compromised by a community committee centrally registering all residents without them knowing it, then the KPI of 'the number of bins of sorted food waste' should have been obviously contradictory. However, at the same time, different managers – usually the Housing Associations – were able to pay the cleaners to hand-sort the waste, such that at least a few bins of sorted waste could be regularly produced.

Lastly, this study makes an important point concerning the attempted use of scientific method to develop government policies such as for residential recycling or other behaviours. The point is, that if the actual factors or determinants driving or hindering the behavior are hidden by policy implementation drifts, then it is inherently impossible to analyse policies systematically or quasi-experimentally to understand which elements or interventions within them were effective in which circumstances (Miafodzyeva & Brandt, 2013). Several review and meta studies have been unable to find patterns in the published candidate determinants across tens of studies (Hornik et al., 1995; Miafodzyeva & Brandt, 2013; Rousta et al., 2017; Varotto & Spagnolli, 2017). There has been a series of linked investigations in Shanghai residential compounds working to systematically develop a typology of all key determinants of residential recycling (Xu et al., 2016), and then abductively spiral in on, at first groups of determinants (Dai et al., 2015, 2016; Xu et al., 2016) and then, precisely-defined determinants (Huang et al., 2018; Lin et al., 2016). Once a draft typology was known (Xu et al., 2016), the determinants have started to be experimentally modified in specific contexts, to build up a prescriptive theory which can make intervention recommendations for any known context. If a program such as Green Account is blindly considered to have Incentivisation as its dominant determinant, then incorrect conclusions can be drawn about the role of incentivisation in terms of human behaviour, economics, and environmental management. The analysis of this paper indicates that if the Green Account program were successful in some communities, it would be more likely due to the ability of the cleaner to cope with the tonnages of waste daily, than anything else. And a hypothesis would be when the cleaner could no longer be paid, the sorting would end immediately. A study of a similar Incentives Program in Nanjing city was carried out using the draft typology described above (Li et al., 2017; Li et al., 2020), and it showed conclusively that the success of that program was substantively due, not to the incentives even though they were reliably being routed to participating residents only, but to Social Influences due to the desire of the participants to

meet each other and the program staff for socialisation daily (Li et al., 2020). Thus, policy focus intention may not be a good indication of the scientific factor determining actual success. It might need more supporting evidence and wider awareness-raising to prevent ongoing mistakes in interpretation and further planning, from occurring.

Conclusions

This study showed how downward devolution in the decision-making stages -especially from the Street level to the community level - significantly contributed to a drift away from the central concept of a policy – incentivising residents – to a focus on defining and fulfilling KPIs that were simple to measure. This in turn actually blocked the intended behavior change intention - of residents regularly recycling. The initial idea, of providing residents with individual household smart cards to obtain daily points for depositing sorted waste, morphed instead into a program where cleaners were paid to sort the waste and the residents did not feel it was their job (Li et al., 2017). The KPIs were devised were to be simple to measure, but they were also simple to shift: community committees considered themselves to be helpful when they centrally registered residents without 'disturbing' them, and/or allocated daily points to them without any connection to the quality of the waste deposited. Because high KPI scores could be returned, the monitoring of the program did not reveal that the behavior of the residents was not being changed. The flexibility given to the lowest-level governments to decide how they implemented the program, allowed grey areas where the policy drift could take place, and result in counter-desire results.

This kind of policy drift, from a simple conceptual beginning concerning 'incentives', to a final one of 'KPI-maximisation', is likely a potentially common phenomenon in multi-level governance, which merits being explicitly pointed out, planned against, and avoided for any kind of policy.

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