

Master's Thesis

慈善救濟與回收：台灣慈濟無酬動機回收之個案研究

Compassion, relief and recycling

A case study of Tzu Chi in the Taiwanese recycling sector, focusing on
incentive dynamics

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Abstract

This study looks at the role of an NGO, the Tzu Chi Foundation, in the institutions of the Taiwanese recycling sector. The Tzu Chi Foundation has since relatively early on recycled in Taiwan and is a unique example globally; MSW-related literature has no reports of NGOs actively recycling themselves. This thesis views the role from a Municipal Solid Waste Management (MSWM) perspective, focusing on incentive dynamics and institutions in the sector.

These incentive dynamics are linked to interests, then activities, which in turn are related to recycling success, which here is measured in terms of ecological impact. It is argued that for the Foundation, hierarchical exclusion takes place, where the ideology incentive dictates that it does not fiercely compete in the recycling market, but instead focuses on improving environmental practice. Results include the quantity that is collected and sorted became less overtime for both paper and total recyclables, as the ideological incentive to collect recycling weakened. Volunteers are also motivated by the ideology, and relatedness incentives, which enabled the organization to grow large rapidly. The whole indicates the potential for ideologically motivated NGOs, but with a side note that ideology is hard to control or replicate.

Whereas not unexpected for a non-for-profit organization, its use of non-material incentives allow it to provide help towards improvement of recycling, and other authors that plead for increased opportunities for informal sector recycling in MSWM development are supported by this paper's results. While not directly visible through the conceptual framework used in this thesis, it is also concluded that its activities provide stimulation for other parties in a recycling sector; however, some problems are also observed considering low-income recyclable collectors known as scavengers. As a result, a framework for studying a recycling sector from an incentives perspective is also suggested.

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Key words

Incentive theory

Institutional context

MSW – *Municipal Solid Waste*

MSWM – *Municipal Solid Waste Management*

NGO – *Non Governmental Organization*

Recycling

Tzu Chi Foundation

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Abbreviations

EPA:	Environmental Protection Administration
EPR:	Extended Producer Responsibility
MSW:	Municipal Solid Waste Management
MSWM:	Municipal Solid Waste Management
NGO:	Non-Governmental Organization
PAYT:	“Pay As You Throw”, a system in which polluters pay by the amount of garbage, either in terms of volume or mass, disposed of.
PET:	Polyethylene terephthalate
R&D:	Research and Development
SME:	Small- or Medium Enterprise
TCQ:	Tzu Chi Quarterly, an English-language publication by the Tzu Chi Foundation

1 Introduction

Kathmandu, 13 May 2015. Several days ago, a serious earthquake shocked the country of Nepal and left hundreds of people dead and thousands homeless. In response, the Tzu Chi Compassionate Relief Foundation, or the Tzu Chi Foundation in short, sent its volunteers and medical experts to help out on the ground almost immediately. Today, tents, blankets and tarps arrive to provide temporary shelter to those who lost the roof over their heads, aside from food and medical supplies that already arrived days ago. Thousands more materials are distributed over the following few weeks to provide further relief (“Nepal Earthquake Relief Update May 10-May 25” 2015).

This, of course, is an impressive example of relief aid provided by the Buddhist Tzu Chi Foundation. What is perhaps more impressive, however, is where many of the materials that were provided come from; before their existence as tents, blankets and tarps: these were namely titled ‘waste’. A large share of Tzu Chi’s relief materials comes not from donations or secondhand materials, but from recycled materials (Vanloo 2015). The organization as such proves its ingenuity when it comes to solving problems, therein supported by its presence in many different layers of society.

Tzu Chi’s homeland, Taiwan, has namely suffered since the introduction of plastics and the country’s rapid industrialization from the consequences of too much waste. Landfills no longer provide a viable long-term option in the densely populated lands and incineration is not always widely embraced either, not in the last place because of air pollution and related health effects. Several government policies, involving incentives for recycling and disincentives for producing waste, have led to decreases in the annual per capita generation of Municipal Solid Waste, (hereafter: MSW) increased waste separation, and an overall increased recycling rate (Lu et al. 2006).

Aside from the actors that are common in recycling sectors across the world however, the Tzu Chi Foundation as a Non-Governmental Organization (NGO) has also provided an important- though sometimes unclear- contribution. The Foundation’s list of facilities sports over 5,000 recycling points manned by *tens of thousands of recycling volunteers*

around Taiwan according to its website (“Environmental Protection” n.d.). They base around the ‘refuse - reduce – reuse – recycle’ priority list, meaning that aside from recycling they promote less use of materials, and refurbish and resell household items and appliances that have been discarded or donated.

This thesis focuses mostly on the Tzu Chi’s role in two streams of recyclables; paper and plastics. Both entail different ways of processing, recycling, re-using and collecting. Using Tzu Chi as an example, it will analyzes the benefits as well as downsides of having an NGO in the recycling sector for these two streams, over a non-NGO (thus private, public, or a mix between those two). From a practitioner’s perspective, both in- and out of Taiwan, either on the policy side or on the not-for-profit side, an in-depth analysis of this situation provides valuable lessons on policies and practices that work or do not work.

However, also from an academic point of view, the Tzu Chi Foundation’s role in Taiwan’s recycling sector provides an interesting and unique example as to how an NGO can help working towards environmental goals. Provided the Foundation’s unique characteristics in terms of operation, combined with a unique combination of government recycling policies, there are many interesting perspectives one can take, and it is a unique case to study how an NGO can provide value- and tension- in a MSW environment.

Secondly, the theoretical basis this thesis uses for analysis is institutional- and incentive theory, consisting of behavioral- and cognitive economics, extended to public governance already by f.e. Wilson (1973), Frey and Jegen (2001) and Tang and Tang (2014). This theory is very much applicable in this situation: an NGO, and people volunteering or working for an NGO, clearly differentiate themselves from private sector and public sector workers in terms of incentives. At the same time, when looking at Taiwan’s history in recycling, it becomes clear that Tzu Chi was an early adopter of recycling practice and currently would by most standards be considered as a good recycler. This thesis wants to explore the relationship between both the incentives and this contribution further.

1.1 Aim of the thesis

The aims of this thesis are several. The main aim is to further understand the Tzu Chi Foundation's role in the institutions of the Taiwanese recycling sector, and subsequently further develop knowledge on good practice in MSW, by analyzing the advantages and disadvantages of having an NGO deeply intertwined in recycling. The analysis in this thesis is done from an incentive theory angle. A clear thing at first sight is that the incentives and motivations for an NGO to engage in recycling are fundamentally different from private sector and public sector institutions. This thesis wants to explore this difference further and see how it causes an NGO's presence in the recycling sector to affect recycling success.

As such, it hopes to lead to further understanding of NGO's potential in other countries' sectors, too; moreover, it hopes to further the understanding of incentive dynamics when an NGO operates in a sector with public- and private parties, something which is quite typical to the Taiwanese recycling sector. It is hoped that both practice and academia can develop further based on the research done.

1.2 Structure of this thesis

This thesis document will proceed as follows. After this introduction, literature will be reviewed to see how this thesis can first profit from- and subsequently add to- the existing body of literature. Literature of roughly three different branches is analyzed: institutional theory, used to outline the different actors in recycling; incentive theory, which will be the main analytical means; finally, MSWM-related literature, to understand the parties and actions that are typical to a recycling sector.

The literature will then be used to set out the directions for the research in Chapter 3, Research Methods. Firstly, research questions are defined. Then, a framework is provided, basing off the literature analyzed in Chapter 2. Thirdly, data that will be used is to be discussed, and finally, contributions to both academic literature- and practice are discussed.

Then, Chapter 4 provides background information regarding the Taiwanese recycling sector and the Tzu Chi Foundation in general. Both of these are necessary to gain a full understanding of the case, which is described in Chapter 5. The Tzu Chi Foundation case was constructed using interviews and gathered documents; a table and source referencing provide insight in where the information described was collected.

Fourthly, the case will be analyzed using incentive theory in Chapter 6 and finally, this will lead to general conclusions and recommendations in Chapter 7.



2 Literature review

This literature review will survey literature on three important points. Firstly, it will summarize and criticize literature on institutions and the incentive theories used to explain public governance to forge a pair of theoretical glasses for study. Secondly, it will survey literature regarding recycling systems and NGOs roles in it; this is done in order to be able to more accurately apply the theories. Some articles are discussed on a per-article basis (e.g. Tang and Tang, (2014); Baud et al. (2001); Wilson et al. (2006)) to observe their frameworks and critically evaluate their studies.

In the theoretical subchapter, firstly an overview is provided of institutional theory written by authors such as Selznick (1943) Ménard (1995), Hodgson (2006). Then, a study by Tang and Tang (2014), who perform a case study on a land ownership case related to ecological preservation, is taken as a basis for incentive theories. Their study looks at incentive theory and uses this subsequently to analyze incentive dynamics in the case; they observe several of the possible dynamics they pointed out in the literature, but not all. Specifically, we will look into crowding effects too, a type of incentive dynamic that was in-depth analyzed and summarized by Frey and Jegen (2001) and viewed from a distance seems to occur in Tzu Chi's case. Finally here, Bussell and Forbes summarize the literature regarding motivations for volunteering, something that is quite obviously relevant to the case as Tzu Chi's recycling centers strongly bases on volunteers.

Both Baud et al. (2001) and Wilson et al. (2006) analyze recycling and MSWM in developing countries; they provide input for this thesis in terms of means of analysis for recycling systems. Moreover, Taiwan, generally considered a developed country, adds to their body of knowledge: it is an exemplar state when considering their conclusions and recommendations, and their rapid development in the last decades of the 20th century. Mohamad et al. (2012a) and Mohamad et al. (2012b) will be analyzed; they look at the role of religious organizations in Malaysia's recycling, a place where Tzu Chi too plays a big role in the recycling sector.

2.1 Institutions: organizations and markets

Looking at organizations and institutions requires proper definitions of the terms. Several authors have focused on defining institutions and their nature. They indicate the importance of ‘rules’ in this definition; a common set of –potentially codifiable- social rules is a crucial part of a social structure that can be called an ‘institution’ or ‘institutional arrangement’, two terms that are generally used interchangeably (Hodgson, 2006; Ménard, 1995). These rules, as well as sanctions when they are broken, may either be explicit or implicit, with the latter often basing off habits and involving less measurable punishments such as social disapproval. (Hodgson 2006) However, it seems generally agreed upon that institutions are observable through behavior (Hodgson 2006; Ménard 1995). Organizations and markets, then, are specific subsets of institutions, as many authors indeed assert (Hodgson 2006; Ménard 1995; Maucourant and Plociniczak 2013).

Organizations quite clearly have a more explicit, distinguishable membership than markets do, and a defined structure with positions relating to coordination (Hodgson, 2006; Ménard 1995). Selznick (1943), citing “A theory of Organization in Public Administration” by Gaus from 1936, defines an organization as ‘*a system of consciously coordinated activities or forces of two or more persons*’. Some authors (e.g. Ménard 1995; Selznick 1943) argue that common goals and action are a requirement for an institution to be labeled as an organization. However, Hodgson (2006) fights such an idea stating that internal conflicts and tensions are almost omnipresent in organizations.

He does say that taking organization as actors is possible as the result of an *abstraction* for analytical purposes, something that is done in this thesis. On a practical level, it is clear that the Tzu Chi Foundation as a whole has different goals and outcomes from its activities in the recycling sector than its individual members, and that as such for analytical purposes it is highly useful to view Tzu Chi as an actor. This abstraction will be made to understand the role the organization plays in the sector, but with careful attention to its individual members.

Markets are different institutions than organizations are; firstly in that they theoretically have reversible positions, i.e. a buyer can become a seller, and secondly in that a market is based around competition (Ménard 1995). It is clearly a more self-organizing, organic form of institution; but how to define it remains difficult. A modern interpretation of Polanyi's study of economy and institutions define the economy as '*the interaction between man and his social environment*' and point out that not all mechanisms of exchange are markets, especially when lacking coherency, but that markets are indeed institutional constructions (Maucourant and Plociniczak 2013). As will be seen in later chapters, the exchange of recyclables in Taiwan indeed seems to be coherent and self-organizing, with many parties being both buyers and sellers.

2.2 Incentives

Incentive theory originates from behavioral and cognitive economics, and focuses on external factors influencing behavior. Many different forms of incentives have over the years been identified and studied extensively, across different fields, ranging in their definition from including non-material incentives, (Tang and Tang 2014; Frey and Jegen 2001; Wilson 1973) to exclusively material (mostly financial) incentives, such as Lyer et al. (2007) The more broad interpretation of the term is taken in this thesis.

Tang and Tang (2014) focus on how context affects incentives, to understand the concept of collaborative governance, and take incentives as a rather broad concept, in line with Wilson (1973). They apply it within a setting of land conservation to understand the dynamics between different approaches to governance and different incentives. As such, they make an important step toward a framework towards, as they put it, understanding Alexis de Tocqueville's (1945) motto "self-interest rightly understood", something that is quite crucial for proper governance.

Tang and Tang (2014) see three different approaches to governance; the first and most obvious being the regulatory one, which in case of land ownership involves using traditional government controls to prohibit certain uses of land or expropriate with compensation. This approach is mentioned to usually not be on friendly footing or sometimes possibly unethical, however, and often has legal, political and financial

obstacles. The second one relies on the market and placement of incentives, and carries the descriptive title “the voluntary approach”. Whereas this often is a more friendly approach, the final control rests with the sellers, and one landowner can block plans while the rest is willing to comply. A third identified approach accesses toolkits from either of these two where fitting, and is thus titled “the collaborative approach”.

Whereas the term material incentives is most often measurable in monetary terms, non-material incentives entail more difficult-to-measure motivators, subsequently split up by Wilson (1973) in purpose-drivers, such as ideology, pride, competence, self-determination, and solidary-drivers, such as relatedness, status and identity. (Tang and Tang 2014) Purpose-drivers are related to a feeling of satisfaction resulting from working towards a certain purpose, whereas solidary drivers relate to social benefits that can be either collective or individual. (Wilson 1973)

Often, more than one incentive is in place, and rather than simply acting in a sum, they interact. (Tang and Tang 2014) Interaction effects between the abovementioned incentives can be synergetic, crowding out, hierarchical exclusion or preemptive. Synergetic refers to effective reinforcement of incentives, thus aligning individuals towards a common goal. Crowding out is an effect in which, whereas incentives may be mutually reinforcing at first, one takes a dominant role and washes out the effects of the others. Hierarchical exclusion refers to placement of incentives in a hierarchy, where actors are not concerned by the less fundamental incentives until the more fundamental ones are satisfied first. Preemptive effects refer to early incentives ingraining themselves, and affecting actors’ stance towards any future incentives.

Analyses of incentive dynamics as such attempts to capture the context of incentives, the subsequent interpretation of these incentives and finally the resulting effectiveness in terms of behavior. As a result, it provides an effective tool for local policy analyses, but also for larger level, more structural analyses as done in this thesis. We will here attempt to capture the incentive dynamics that affect the Tzu Chi Foundation, and resulting impacts on national recycling success. As a means of analysis, incentive dynamics requires qualitative research to interpret the surrounding and interpretation of an incentive.

However, whereas the differences, advantages and disadvantages are not always fully agreed upon in the socio-psychological and management fields, studies show general differences between decision-making and incentive effects for example when working in groups or as individuals (e.g. Michaelsen et al. 1989; Kameda et al. 1990; Garbers and Konradt 2013). The brief analysis of institutional theory earlier made clear that considering organizations in this context would require an abstraction; however, it is quite expectable that for many analyses involving incentive theory such an abstraction will only be helpful towards building a full understanding of the situation if applied carefully and with attention to individual members' incentives.

In the context of an NGO operating in the recycling sector, non-material incentives are important sorts of incentive to explore further; volunteers working for an NGO have, as opposed to private sector individuals, no direct financial incentives. Frey and Jegen (2002) explore the dynamics between external interventions and intrinsic incentives, combining economic and psychological perspectives in what they call "Motivation Crowding Theory". They study the earlier-mentioned crowding out effects and its opposite, crowding in effects, in particular, and point out how the former may undermine traditional understandings of the laws of economics. "Crowding-in" overlaps with what Tang and Tang (2014) term synergy, the former of which refers to material incentives strengthen non-material incentives.

Whereas crowding-in is an effect that is in line with general assumptions rational actors maximizing their outcome, crowding-out further describes how an external incentive may undermine an actor's self-determination or self-confidence and as such reduce output or performance. On a market-level, the level of study for economists, this means that supply is reduced to below its original levels. Crowding effects thus play at a cross-section between psychology and economy. A change in motivation along a polar line running from intrinsic to extrinsic can be explained by either a) a change in preferences or b) a change in the perceived nature of the task, the task-environment or self-perception. As such, self-motivation is reduced by outside intervention (i.e. either rewards or punishments) and output or success is reduced; however, external interventions may also strengthen intrinsic motivation, which results in the crowding-in effects.

After outlining this theory, the authors continue to point out empirical evidence in the form of other studies, placing these in context of the theory. An example which is specifically important when discussing an NGO is a study by Freeman (1999). Freeman uncovered evidence that payment for volunteering work significantly reduces output, even so much that the *amount* of time individuals want to work more when rewarded does not make up for it. This would suggest that Tzu Chi members are likely to work more than when they would be extrinsically rewarded for their work.

Crowding theory, in a market where an NGO is active as the Taiwanese recycling sector is, may be a very strong explanatory theory. With their article “Motivation Crowding Theory” Frey and Jegen (2002) do not only outline in detail the mechanics of the theory, but also do they provide a very convincing set of evidence to prove these mechanics. Moreover, it is an example of how a psychological theory, playing at the individual level, can quite easily be transferred to a market-wide environment involving a large set of individuals.

General incentives or motivations for volunteering behavior are analyzed and compared from literature by Bussell and Forbes (2001). They make the assertion that much of volunteering work is done out of altruism. However, as studied by Mueller (Bussell and Forbes 2001), individuals also do volunteering for egoistic motives such as selective incentives (i.e. social status or contact), having families in the subject group of volunteering, and improvement of ‘human capital’ (knowledge and experience). The second reason is perhaps less relevant to recycling work; the first and the last may be more relevant to Tzu Chi’s volunteers.

They gather from the literature too that volunteering often is a means of expressing values. (Omoto and Snyder 1993; Bussell and Forbes 2001). As such, religious association creates a greater likelihood to volunteer, as it often allows people to express religious values. (Wymer 1997; Bussell and Forbes 2001) This value-expressive function is as such directly related to the ideological incentive. With the nature of Tzu Chi and its strong Buddhist value system, it is clear upfront that this plays a big role for many of the Taiwanese members to get involved in voluntary recycling work.

2.3 Recycling- & MSW systems

Much and more has been discussed in the literature about Municipal Solid Waste Management, or MSWM. More specifically, recycling has been discussed widely, from a vast number of perspectives too. Many of these involve the consumer end of recycling; mostly how to use policy tools to motivate consumers to recycle or which attitudes and motivations support consumer recycling. This is less relevant here, however, as this thesis does not focus on the consumer aspects of recycling so much as the organizations behind recycling.

A study by Baud et al. (2001) observed different MSWM systems in developing countries and partnerships; specifically, in Chennai (India), Manila (Philippines) and Lima (Peru). They firstly use a classification by an earlier study of the involved actors, which are the public sector, the private sector, the small-scale informal private sector and local communities and their representatives (Community Based Organizations, CBOs). (by Baud and Schenk 1994; as cited in Baud et al. 2001) They evaluate the partnerships between different groups of actors in terms of sustainable development, socio-economic equality and public health; they derive their criteria from different literature sources.

Table 1 Goals of MSWM for sustainability - Source: Baud et al. (2001)

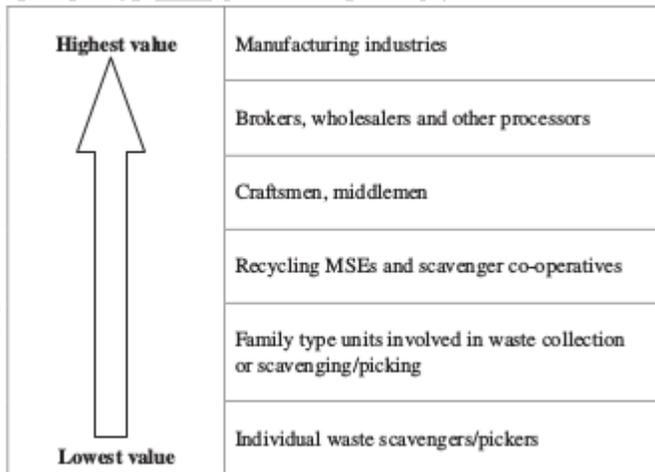
Ecological sustainability	1. Minimal household waste production
	2. Maximization of material re-use and recycling
	3. Controlled disposal of remaining waste
Socio-economic legitimacy	4. Good co-ordination within the SWM sector
	5. Financially viability for both consumers and local governments
	6. Provision of employment with a living wage and job security
Public health	7. Attention to health and safety aspects
	8. Greater effectiveness in terms of a healthy and clean urban environment
	9. Legitimacy in the eyes of consumers and actors

Several of their results may be relevant to this study. They found that local authorities strongly prefer controllability and accountability, and thus are more likely to cooperate with large-scale enterprises. Informal, small-scale actors are in the cases studied most often integrated into the MSWM systems by NGOs and CBOs, resulting in benefits on all three of the identified relevant types of goals. They thus plead for a more inclusive approach to also incorporate relationships with smaller, informal actors, so that local authorities may aim to work also with these parties.

Wilson et al. (2006), too, plead for an integration of the informal waste sector into developing countries' MSWM systems, while diving deeper into the informal sector. Their study initiates by defining the informal sector as “*characterized by small-scale, labour-intensive, largely unregulated and unregistered, low-technology manufacturing or provision of services.*” (Wilson et al. 2006). They too identify an unwillingness of the formal sector to cooperate with the informal sector; they even go further by stating that the formal, mostly public sector often regards the informal sector as impossible to cooperate with and unhygienic.

They identify a number of different types of informal recycling: a) itinerant waste collectors, who collect from households; b) street waste picking, who recover materials from the streets and bins; c) municipal waste collectors, who recover materials from collection/transportation vehicles and d) scavengers who recover

Figure a - Informal recycling hierarchy - Source: Wilson et al. [2006]



recyclables from dumps. The more organized any of these are, the authors assert, the better-protected from exploitation they usually are. The different ‘layers’ or actors of the informal sector recycling chain identified are depicted in Figure a.

Subsequently, they adapt a list of activities from several sources from the literature that occur in a recycling sector in general, not only in the informal sector. These activities are

separated and explained in how they add value along the recycling chain. This list is displayed in Table 2.

Table 2 Ways of adding value. - Source: Wilson et al. (2006)

Extracting and adding value processes	Explanation and comments
Collection	Identification and picking of items or collecting mixed waste allows the sector to acquire the waste and turn it into a resource. Most primary materials recovered from refuse, such as paper, plastics, rags, metal, glass, and food leftovers, constitute a commodity as they all have a market price
Sorting	Main process that increases the value of the waste recovered. The deeper the sorting differentiation, the higher the value of waste. For instance, if plastic is grouped into one major category, its value is lower than when it is further separated into sub-categories of hard and soft, then HDPE, PET, LDPE, etc. Sorting according to color, size, shape and potential use or re-use of the materials so as to meet the end-users quality specifications.
Accumulation of volume	Additional volume adds value: larger volumes command higher per-unit prices. The greater the quantity, the better bargaining power the trader has. For small quantities, transactions costs, such as checking quality, arranging transport and paying the seller, reduce the profit margin. Industrial feed stocks are massive in volume. It follows that storage space is required
Pre-processing	For instance: washing, changing in shape-cutting, granulating, compacting, baling
Small manufacturing craftsmanship	Creation of micro-enterprises that use the special skills of informal recyclers to transform recyclates into articles traded directly to the community and being affordable by the poor
Market intelligence	Proximity to markets where informal recyclers and traders conduct business allows for the flow of information which allows decisions to be made on accurate market prices, competitors, trading partners, etc
Trading	In informal or formal markets. Links to the secondary materials network are crucial. Traders should be financially capable to add and conserve value of recyclates. Difference between buying and selling should also provide buffer against risk

The authors explore the socio-economic aspects of incorporating an informal recycling sector. In the first, the authors point out a mutually beneficial relationship between

informal recycling systems and developing societies: they clean up waste, while providing jobs for vulnerable groups and capitalizing on a low-income, labor-intensive environment. The authors point out that where Western countries have abolished their informal sectors, they have subsequently struggled to achieve recycling rates of when their informal sectors were in place.

The authors point out public policy has largely been negative towards the informal sector. This is either by repressing, neglecting, or colluding. However, they also point out, at the time of writing their article, there was already a turnaround occurring in which informal sectors received increased legitimacy and cooperative stances. Nevertheless, stances towards the informal sector are, even in those countries where legitimacy is somewhat increased, negative in majority.

Both Wilson et al. (2006) and Baud et al. (2001) analyze recycling in *developing* countries. That would on first sight be a step away from the topic of study in this thesis. However, upon closer observation, it becomes clear that they provide invaluable input to this thesis, for three reasons. Firstly, they form a small body of literature that explicitly considers NGOs and the informal sector as a possible part of a recycling system and thus are related to the topic considered here. Secondly, they argue for systems similar to that in Taiwan, in which the informal sector is cooperating with the formal sector, rather than following the Western example of eradicating the informal sector completely. That makes a study such as the one proposed here key: Taiwan's system and the integration of Tzu Chi as an NGO could provide highly valuable lessons to countries that are currently developing their MSWM systems. Thirdly and finally, related to the previous argument, Taiwan's general economy developed more rapidly and recently than most Western developed economies, which are more widely considered as examples in MSWM literature; yet, this places Taiwan as a whole closer to economies that are developing today, as economy and waste processing seem to be linked from earlier studies by Okumura et al. (2014) and Vujić et al. (2015).

Two publications that are also highly related to the topic of this thesis were written regarding religious organizations in the recycling sector. These include Mohamad et al. (2012a) and Mohamad et al. (2012b); both publications focus on Malaysia, a country

where less than 1% falls under the label of agnosticism or atheism. These studies are related to the one in this thesis due to the religious values of the Tzu Chi Foundation; moreover, they (however implicitly) focus on incentives, too.

The main question asked by Mohamad et al. (2012a) regards which motivations can increase effective community participation to recycling, which they underline is crucial in terms of 1) sorting at the community level and 2) recovery of high quality recyclables. The authors, as the previous paragraph suggests, focus on answering this question looking at successful recycling programs by religious communities, suggesting harnessing the values of the religions of Malaysia’s largely religious society. ‘Successful’ here is defined as the organization having established long-lasting operations after a number of stages outlined in Table 3. It becomes quite clear that Tzu Chi in Taiwan has already long reached the status of successful following this definition:

Table 3 Successfulness of recycling programs. - Source: Mohamed et al. (2012a)

1. Knowledge: Member of religious community knows about recycling and gains understanding about it.	 Higher level of adoption
2. Persuasion: Members of religious community actively seek for more information about recycling, and forms favorable attitude towards it.	
3. Decision to adopt: Members of religious community consider adopting recycling activities after consciously weighing its advantages/disadvantages.	
4. Implementation: Members of religious community have experimented with recycling activities either in a short-term or ad-hoc manner.	
5. Confirmation: Members of the religious community conduct the recycling activity in a more continuous manner and try to improve the activities overtime.	

The theoretical lens they apply is a framework named the “Technological Transitions Framework”, developed by Geels (2002). The framework explains sustainable

development as something that is initiated locally in- and between ‘niches’. This subsequently spreads through a ‘network of regimes’, a larger collection of ‘niches’. As this then becomes regular in the regime, it jumps over to other regimes, finally impacting the larger landscape.

Specifically interesting in the study by Mohamed et al (2012a) is the role that the Tzu Chi Foundation plays. In Malaysia, they run one of the most successful recycling programs in the country (Mohamed et al. 2012a; Mohamed et al. 2012b). The volunteers in Malaysia operate largely on their own, but cooperate with local municipalities in Malaysia and receive support from the liaison office in Taipei and trainings from other Tzu Chi branches, the authors of Mohamed (2012a) point out.

Mohamed et al. (2012b) provides extensive insights in the common success factors of the studied religious recycling programs. Firstly, they point out, all of the programs studied are highly systematic in collecting, segregating and subsequently selling the recyclables. Secondly, the religious groupings all execute their recycling in the long-term, with eye for improvement. This, however, was already suggested in their criterion for the organization to be ‘successful’, and selected for both studies, as discussed above. A further point of critique is that neither seem to explain *why* religious groups in this case would perform better than others.

3 Methodology

This chapter will further dig out the main aim and research methods that will be used for the proposed thesis. The research will look at the NGO in the recycling sector will be looked at in terms of the incentives that surround it. A secondary aim is to learn more about the theory surrounding institutions and incentives, and the dynamics between incentives; the expectation is that specifically, motivation crowding effects will be observed. These are likely to play between monetary incentives, and the incentives as a result of the NGO's ideals- as a result, monetary incentives may undermine or come to overrule intrinsic motivations at the organizational level. If these, however, are not found, it would be interesting to see how both incentives coexist and synergize to align actors.

Clear from the beginning was that recycling done by the Tzu Chi Foundation, and its interaction with the rest of the institutions in the recycling system, would be used to answer the above question. This makes Tzu Chi in the Taiwanese recycling sector a case study; the literature analyzed in the previous chapter has made clear that there is not yet any research done related to this question. Tzu Chi's large-scale presence along the recycling chain seems an oddity for NGOs. Whereas the Tzu Chi Foundation is by no means the only recycling-related NGO, or even the only NGO engaging in recycling activities, the scale of their operations is- as far as the author is aware- unique, and may provide beautiful learning opportunities.

This chapter will therefore start by building a framework for further analysis, based on the literature. Secondly, case data will be considered in terms of types, collection methods and analysis. Thirdly, this chapter will discuss what contributions this thesis will aim to make to the existing literature. Finally, a last brief subchapter will discuss early insights and a brief collection of expected results.

3.1 Research questions

The main research question that was already phrased above is formulated as:

“What are the incentive dynamics for an ideological NGO operating on a large scale, along the value chain, in the recycling sector, and how may this affect its contribution to recycling?”

To narrow this down and answer it, several case-specific sub-questions need to be considered. Regarding general incentives that are in place, that will be the following questions:

- 1. What incentives did Tzu Chi as an organization have to operate in the recycling sector over time?*
- 2. What incentives does the Da.ai Technology Corporation have over time?*

Regarding the interaction of these incentives, that will be the following

- 3. How did the incentives of the Tzu Chi foundation interact and change over time?*

Regarding the effects on recycling success:

- 4. What have been Tzu Chi's and Da.ai's recycling activities?*
- 5. What have been their effects on Taiwan's recycling success?*

Regarding theoretical lessons:

- 6. How can this example be generalized to understand the potential role of an NGO?*

3.2 Conceptual framework

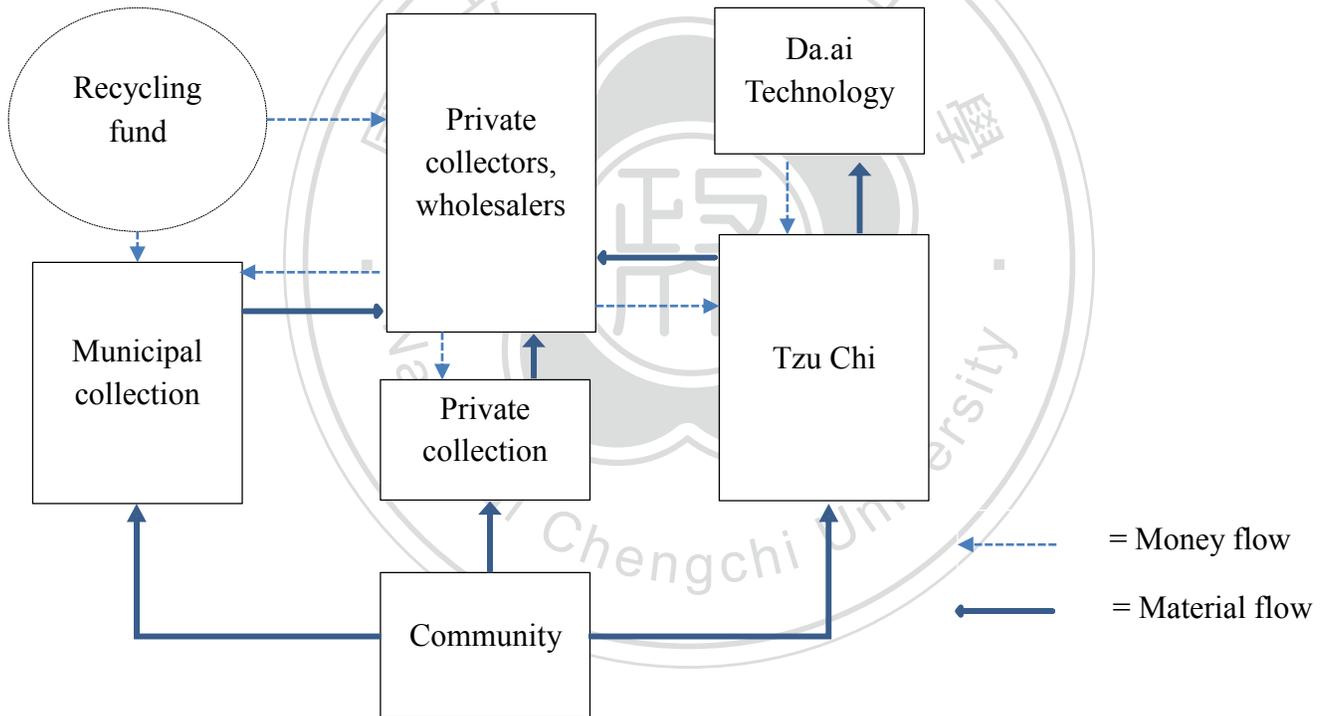
The literature reviewed in chapter 2.2 has brought up several important parties and relationships within recycling sectors that are commonplace. Subsequently, a framework is constructed to investigate the dynamics between the different institutions in recycling, with a focus on the role of Tzu Chi as an NGO.

The key actors in the framework to study will –quite evidently, from the previous analyses- need to be the private sector, the public sector, the community and the Tzu Chi Foundation representing the NGO section. With the exception of the Recycling Fund

included in the diagram, the rule is: the higher up in the picture, the higher the position in the value chain identified by Wilson et al. (2006) (chapter 2.2, figure a)

The visual outline depicted below in figure b bases off the ‘map’ of the recycling sector by Bor et al. (2004), that will be further discussed in chapter 4.1.2, and forms a means of understanding the structure of the Taiwanese recycling sector.. Moreover, as it is less relevant to the topic of study, the producers paying into the fund have been left out. Please do note that this is not the conceptual framework yet; it displays the Taiwanese recycling sector, based on which the framework will be set up.

Figure b - structure of the Taiwanese recycling sector. Source: adapted from Bor et al. [2004]



Within this system, the community, through consumption, produces recyclables that are collected by municipal collectors, private- and sometimes informal- collectors such as scavengers, and the Tzu Chi Foundation. Most of these are sold to wholesalers and larger scale private collectors, who receive money from the national recycling fund to operate; money that thus trickles down to the other actors, too. These wholesalers and collectors typically sell it on as a resource to industry, sometimes already pre-processed. The Tzu

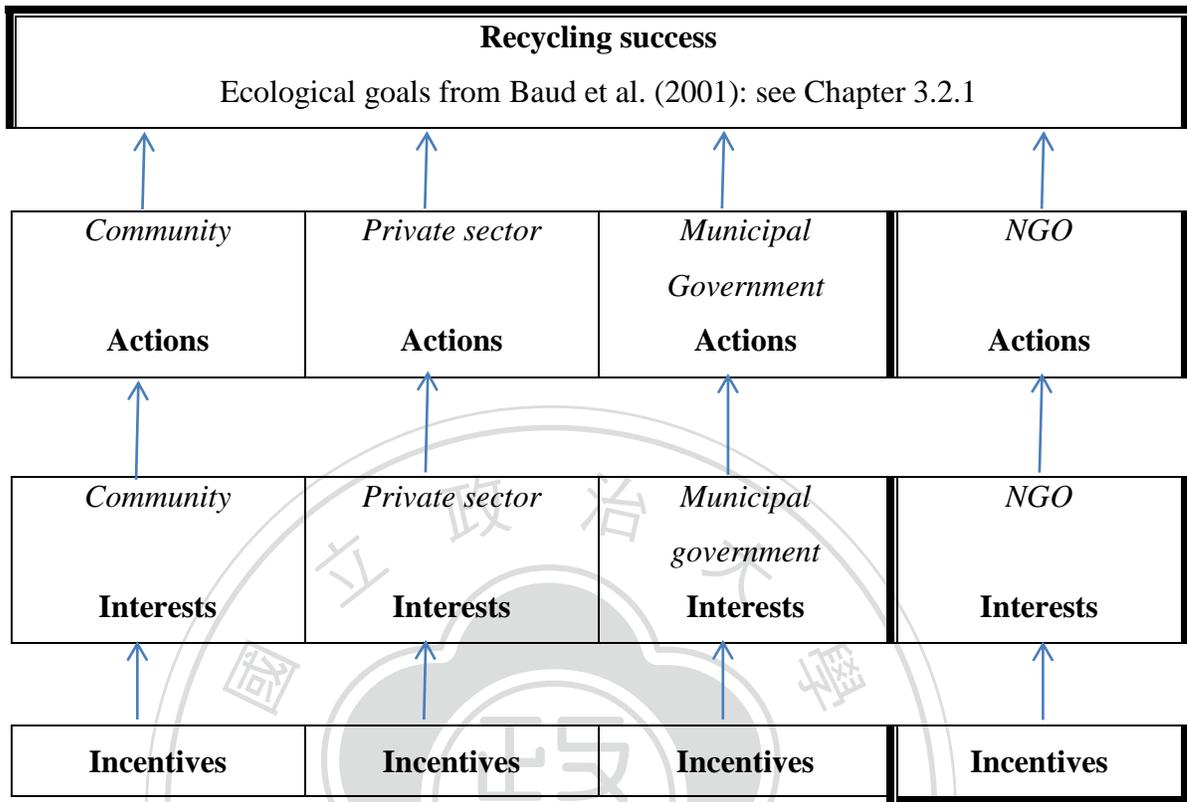
Chi Foundation however sells a large share of its collected PET-bottles, and in recent year also other recyclables, to Da.ai Technology.

Da.ai Technology is a recyclable processing and Research and Development (R&D) company that was initiated by Tzu Chi volunteers, some say at the suggestion of Cheng Yen. Its equity is in the hands of the Tzu Chi Foundation, and its profits get donated back to the Tzu Chi Foundation. It purchases its recyclables only from the Tzu Chi Foundation, and makes and sells emergency products such as blankets and prefabricated housing, all made out of recyclables, back to the Foundation. When considering Tzu Chi's recycling activities, it will thus also be a relevant actor to consider in this structure.

The right hand side in the diagram is reserved for Tzu Chi and Da.ai, whereas the center (aside from 'community') includes government organized institutions. On the left, there is the private sector, which is visibly quite well integrated in the system, as opposed to the Tzu Chi Foundation. A final note must be made regarding the top arrows flowing from the NGO and industry entities; these flows are not topic of study, and would most likely involve a plethora of actors such as consumers, other industry parties, and Tzu Chi's aid recipients. For simplification, these are regarded as flows in- and out of the system.

Following the theoretical work done by Frey and Jegen (2001) and Tang and Tang (2014), the set of incentives that are in place in the institutional environment will be taken as a key topic. Observing how these affect the Tzu Chi Foundation's interests, and subsequently actions, the dynamics between the incentives will be determined, as well as the impact of the organization on recycling success.

Table 4 - Conceptual framework. Source: own.



This research focuses on the influence of the NGO on the right hand side, and the incentives that are in place for the NGO; the variables will thus only be considered for the Foundation. However, following Hodgson's (2006) assertions that organizations are comprised of individuals and should be studied with consideration of them, individual incentives of Tzu Chi Foundation volunteers will be taken into account for completeness; but in order to make an analysis of the impact on the whole system, the organization will be considered as an actor, thus requiring focus on communications from the organization as a whole.

Through the framework, the impact of the *set* of incentives on the Tzu Chi Foundation's and its volunteers' interests and subsequent behavior is analyzed for a number of different identified periods of time. Then, it is compared in terms of its contribution to national recycling numbers to observe its contribution to recycling success. Whereas an earlier goal was to incorporate the whole of Baud et al.'s (2001) goals for recycling success, this is simplified to focus on numbers that are publicly available, which

concern total recycling of paper and plastics. Finally, the evolving incentives over time become subject of scrutiny, to understand how these interacted and developed, and structurally impacted recycling success.

The framework furthermore separates ‘incentives’- i.e., the factors that motivate- from the resulting view of the actors’ interests, to get a clearer picture of how incentives are perceived and lead to action. Generally, incentives are studied as to how they affect behavior- for example, in Lyer et al (2007)- but to display the interaction, the extra ‘interest’ variable is displayed, attempting to capture how incentives are interpreted and subsequently affect the behavior- i.e. actions- of the NGO.

3.2.1 Operationalization

The above framework, though correct, is still a general one. When using this framework, it is useful to zoom further in on only one or two streams of materials. This framework cannot be applied to some streams, as they for example do not fall within the Recycling Fund or within Tzu Chi’s scope of activities. Therefore, the focus will be on plastic and paper, which following table 6 on the next page are two recyclables that fall within the Recycling Fund (EPA, n.d.), are also recycled by the Tzu Chi Foundation (Tzu Chi Foundation website, 2011) and consistently make up two of the largest classes of recyclables in Taiwan (EPA, 2016a)

Case studies, as seen from the literature review, are an often-used tool when observing MSW-systems and recycling systems. Gerring (2007; p. 19) defines a *case* as a “*spatially delimited phenomenon (a unit) observed at a single point in time or over some period of time.*” It is thus important to stipulate, apart from the phenomenon, a time-period or point in time. The period in time in this thesis will be from the beginning of Tzu Chi’s recycling until the start of the study. The case studied is the recycling done by Tzu Chi as a part of the Taiwanese institutional recycling environment.

A point worth mentioning here is that the plastic bottles processing are legally done by another organization, Da.ai Technology. However, this organization, which calls itself a ‘non-profit company,’ was started by the Tzu Chi Foundation, still holds intensive

operational ties, is owned by the Tzu Chi Foundation, and donates its full income after expenses to the Foundation. For analytical purposes in this thesis, it will therefore mostly be assumed to be under the label NGO/Tzu Chi.

For measuring recycling success, Baud et al.'s (2001) definition would be ideal. However, to avoid over-complication, the analysis in this thesis focuses on the ecological sustainability goals, as these have public statistics available and can thus be analyzed more exact than most others; nevertheless, establishing a direct statistical link is not attempted. These statistics provide an image of the trend and are related to qualitative sources throughout the analysis.

Table 5 - Ecological Sustainability (Recycling Success). Source: Baud et al. (2001)

Ecological sustainability	1. Minimal household waste production	EPA statistics; MSW/capita/day (kg)
	2. Maximization of material re-use and recycling	Recycling percentages of Tzu Chi and EPA.

Table 6 MSW composition in Taiwan - Source: EPA website (n.d)

Period	Total	Physical Composition (On Dry Base)										
		Combustibles								Incombustibles		
		Sub-total	Paper	Textiles	Garden Trimmings	Food Wastes	Plastics	Leather & Rubber	Others	Sub-total	Iron	Other Metal
%	%	%	%	%	%	%	%	%	%	%	%	
2002	100.00	90.43	30.01	3.65	4.43	23.34	20.23	0.60	8.17	9.57	3.07	
2003	100.00	92.98	32.97	3.78	3.88	27.19	21.36	0.22	3.58	7.02	2.58	
2004	100.00	93.57	31.56	4.90	4.91	29.76	20.60	0.87	0.98	6.43	1.89	
2005	100.00	95.97	38.64	2.38	1.93	38.15	13.78	0.43	0.67	4.03	0.85	0.29
2006	100.00	97.64	44.30	1.84	1.74	34.57	14.63	0.19	0.36	2.36	0.50	0.33
2007	100.00	97.61	41.75	3.20	1.83	32.86	17.13	0.51	0.33	2.39	0.41	0.25
2008	100.00	97.84	44.54	2.63	1.99	30.56	17.28	0.36	0.48	2.16	0.33	0.22
2009	100.00	97.93	38.87	2.29	1.76	37.42	16.74	0.41	0.44	2.07	0.35	0.25
2010	100.00	97.10	39.57	2.52	1.74	35.68	16.57	0.51	0.52	2.90	0.33	0.34
2011	100.00	97.44	38.31	2.04	1.39	39.21	15.66	0.23	0.61	2.56	0.22	0.30
2012	100.00	97.46	38.85	2.52	1.46	38.33	15.61	0.20	0.49	2.54	0.28	0.22
2013	100.00	97.88	41.71	2.35	1.32	35.07	16.57	0.36	0.52	2.12	0.27	0.21
2014	100.00	98.01	39.42	2.34	1.31	37.64	16.56	0.14	0.60	2.00	0.21	0.30
2015	100.00	-	-	-	-	-	-	-	-	-	-	-

3.3 Methods

This chapter will outline what types of data were collected, how this was collected, and how it was analyzed, respectively. For the analysis, the Tzu Chi Foundation in the Taiwanese recycling sector will be taken as a case study of an NGO in a recycling sector. As much of the information sought relates to qualitative information, a case narrative is built describing organizational interests, individual interests, main courses of action, activities, and contributions towards recycling success.

3.3.1 Data

For the background understanding of both Taiwanese recycling and the Tzu Chi Foundation as a whole in chapter 4, the literature was used and cross-referenced to come to a full understanding; a major source of literature regarding the Tzu Chi Foundation was one ethnography published by Huang (2009), but other sources were used as well. Additionally, some laws and policy documents published by EPA were obtained online.

For building the case, mostly qualitative data was gathered. The data that was collected to form Tzu Chi's case was limited by language barriers; for example internal documents are on a large scale an unlikely means of building the case. Interview data, however, is very interesting and provided insights on the motivations and goals of those involved in Tzu Chi's recycling. This data thus provides a further understanding of the incentives that are in place for the Tzu Chi Foundation and its members, and being primary data this source provides unique opportunities to clarify where other sources lack.. Effects of incentives on its interests, actions, and subsequent impacts on recycling success, were observed.

Qualitative, secondary data was also obtained from the Tzu Chi Quarterly. While this is a magazine that the NGO itself publishes, and thus allows for a considerable level of self-filtering, self-censoring and idealized images, it does allow sequencing recycling events that play a role within the organization, and provides an insight into incentives, interests and activities across the organization. Supplemented by aforementioned interviews, it provides a whole picture of events, actions by the organization, and their motivation.

Also, secondary quantitative data was obtained regarding the volume of recycling over time. This was used to identify trends, place information into context, and understand the scale of Tzu Chi's operations within the Taiwanese recycling sector.



3.3.2 Collection

Quantitative data

Quantitative data about the general Taiwanese sector are published by the EPA (regarding recycling done by government agencies over several categories) and quantitative data about Tzu Chi's recycling was published yearly since 1995. National Taiwanese statistics are available since 2001 at the EPA; statistics from 1998-2000 were found in the literature, recorded by the EPA and preserved in an article by Lu et al. (2006). Tzu Chi's data is available online for the period 2005-2015 in Tzu Chi's Yearbooks (*Nianjian 年鑑*) in Chinese, and the data for the period 1995-2005 was obtained through hardcopy versions of the report under the same name.

For Tzu Chi's quantitative statistics, no consistent system seems in place; on a yearly basis, some extra categories are created, such as 'plastic bags' in 2009. Nevertheless, a category 'plastic products' includes plastics that are not separately reported; a total of Polyethylene terephthalate (PET), plastic products, and since 2009, plastic bags, was taken as a total of plastic. Paper has consistently been reported since 1995. Total numbers were published every year except for 2001; the reason for this is unspecified.

National Taiwanese statistics are published online by the EPA. The agency both published numbers about specific products that fall under the recycling fund (see Chapter 4.1.1 for an explanation) and more general categories of recyclables, recycled only by government agencies. The more general statistics were observed in this case. Whereas these would not include the Tzu Chi Foundation's recycling, they do provide the most complete available overview of Taiwanese recycling amounts.

Qualitative data

Interviewees were approached through an initial contact person in the organization, who introduced the researching student to two other contacts; from here, further contacts were sought. This resulted in 5 interview sessions with 6 interviewees. Of these 6 interviewees, 3 were Da.Ai Technology employees, 5 were volunteers, 1 was a Tzu Chi Commissioner and 1 held a leading position at a recycling station, and 1 had functioned as a tour-guide

around the recycling station. All interviewees were selected on the basis of their experience; more experienced volunteers can logically be expected to have more knowledge of the organization through exchanges between stations and central events. Every interviewed volunteer had experience of five years or more with the organization.

Before interviewing, stories from the Tzu Chi Quarterly (TCQ) were collected. Stories were collected over 1996-2007 and 2011-2015. Before 1996, and between 2007 and 2010, the Tzu Chi Quarterly was not retrievable. In total, 28 stories were found, from which a further understanding was built of Tzu Chi's recycling events, motivations and strategies. All these stories included insights from individuals or projects that the Foundation deemed desirable, indicating where its incentives lied. Almost all stories were reports of volunteers and described in detail processes at the recycling stations; 3 stories were editorials.

Interview no.	Code	Position	Volunteer	Experience with organization (approx.)
I	Da01	Employee at Da.ai Technology	Yes	5 years
I	Da02	Employee at Da.ai Technology	No	?
II	To01	Former tour guide at recycling station	Yes	10 years
III	Co01	Tzu Chi Commissioner	Yes	26 years
IV	Ma01	Recycling station manager	Yes	10 years
V	Da03	Da.ai Technology Employee	Yes	8 years

Additionally, visits were made to the Tzu Chi recycling station in Neihu to observe and talk to volunteers. Approximately 8 hours of time were spent on observing- and participating in- collecting and initial sorting of the recyclables.

3.3.3 Analysis

The interview data was analyzed and structured after transcription. Quotes relating to certain topics from both interviews and the TCQ are mentioned in Appendix 2. The information gathered from this is built into a logical narrative after careful consideration of the evidence. This narrative will subsequently be analyzed together with the recycling background using the theory, looking for incentives, interests of actors, and resulting outputs of organizations in the recycling sector, to observe dynamics between incentives. In terms of ‘actions’, both trends- as well as clear-cut decisions are distilled from the case narrative.

With both qualitative data sources used, it is important to control reliability of the information. Both external media sources and quantitative data were used to cross-reference with descriptive data and to put it into context. However, no quantitative links are established. Where specific events or policy changes that can be factually checked are observed, literature and then media will be the preferred options for cross-referencing. Answers from interviewees are compared to each other and media sources; contradictory information is left out or, if such a contradiction is considered relevant to understanding of the case, made explicit.

4 Backgrounds

This chapter will provide the background information to the case: Firstly, what the Taiwanese recycling and MSW sector is and how it has grown into what it is today, and secondly, the background of the Tzu Chi Foundation. As such, it provides a further understanding of the case that will be presented after it, forming organizational- as well as macro-level context. This chapter bases largely off secondary sources; the EPA's information, news outlets, and literature, but where possible it will also be supplemented by fragments and examples from Taiwanese recycling and MSW laws and directives; several of these have been translated into English by the EPA itself, and if necessary, a translation will be provided here.

4.1 Taiwanese MSW

Despite perhaps running relatively smoothly in modern times, Taiwan's recycling is a development of the last few decades. This chapter will first provide a history of a developing legal framework for MSW and recycling in Taiwan, then continuing to briefly discuss collection and processing methods, then the informal sector, after which it will focus on the more recent sector characteristics, and analyze different incentives that are and were in place.

4.1.1 A chronology of policies and incentives

Taiwanese attention for responsible handling of waste began in 1974 with the implementation of the "Solid Waste Disposal Act", before which open dumping without environmental regard was common practice (Pariatamby and Tanaka 2014; Solid Waste Disposal Act 2013). Even until ten years after the implementation of this directive, which has been revised 12 times since its implementation, many still describe Taiwan's MSW as having been virtually nonexistent. Open dumping and uncontrolled landfill facilities were still commonplace (Houng 2013; Ho et al. n.d.).

In 1984 legislators showed that they had become more aware of waste during a time of rapid economic development and subsequent increases in waste production. The so-called

“Municipal Solid Waste Disposal Plan” was implemented, ordering sanitary landfilling as the short-term solution to MSW and incineration as a long-term goal. (Ho et al. n.d.; Houg 2013; Pariatamby and Tanaka 2014) Accordingly, in 1991 the construction of 21 incinerators around Taiwan began. (Ho et al. n.d.; Houg 2013; Pariatamby and Tanaka 2014) Most of these finished around the end of the 1990s, some in the 2000s. During construction, local and central EPAs were under fire of numerous NIMBY movements that opposed incineration in their neighborhoods. (Hsu 2006)

Also incineration was soon considered an insufficient means of disposal by itself, and the inception of modern recycling began with the EPA announcing implementation of Extended Producer Responsibility (EPR) for several product types, leaving responsibility for recycling with producers, importers and sellers; this was stated and specified over the period 1989-1997 according to Lu et al. (2006). The same others point out that this is when environmental messages were promoted by the government to encourage households to recycle. It is an example of a regulatory approach, where the responsibility for recycling is forced on those that initially produce the recyclable materials.

Slightly later in 1998 the “4-in-1 program” was established, that involved integration of a recycling fund, which is to be paid for by said manufacturers, producers and importers; the name furthermore refers to the community; the government and the private sector. The recycling fund was to be used to fund a recycling and disposal system, removing the responsibility for actual recycling activities for most product groups from producers, sellers and importers and instead switching to a financial contribution for these. (Lu et al. 2006; Lee et al. 2000) The new system thus focused on price-control, rather than quantity control, through a market-incentive system by subsidizing collectors, traders and recyclers of both government and (audited) private parties. (Bor et al. 2004)

Table 7 MSW collection during the 1990s and early 2000s - Source: Tsai and Chou [2006]

Year	Amount collected (metric ton)
1991	7,239,000
1992	7,979,000
1993	8,217,000
1994	8,493,000
1995	8,708,000
1996	8,713,000
1997	8,882,000
1998	8,882,000
1999	8,566,000
2000	7,854,000
2001	7,255,000
2002 ^d	6,734,000
2003 ^d	6,161,000

The recyclable market was effectively after 1998 the main institutional disseminator of financial incentives for collectors, traders, and the Tzu Chi

Foundation, too. However, this market, providing resources materials to different industries, is heavily subject to substitution. The main reason recyclables are attractive are for their lower prices for resources; if market prices for ‘fresh’ raw materials drop, then recyclables lose their attractiveness and will experience a price drop, too. This has occasionally proven itself problematic, for example for the already vulnerable scavengers described in subchapter 4.1.2.

The 4-in-1-system is a much more voluntary approach than what was maintained before; on the whole, this program initiated the collaborative policymaking in Taiwan on the recycling topic. Nevertheless, increased regulations were placed to further reduce production of recyclables, rather than only collaborating to increase recycling.

During the late 1990s, the main value framework became the “3R” approach, centering around Reducing, Reusing and Recycling waste products where possible. (Houng 2013) As a part of this, plastic bags became a paid commodity rather than a free handout at stores. This became official in 2001, with the “Environmental Protection Convention on Use of Shopping Bags Instead of Plastic Bags”, which also outlined that plastic bags should be more durable so that they can be used more than once. (Houng 2013; Pariatamby and Tanaka 2014) As a result of promotion efforts and several regulations such as the abovementioned and the “Restriction on the Use of Plastic Shopping Bags and Disposable Tableware” in 2006, banning disposable tableware in schools and government agencies, MSW production reduced sharply.

In 2003, the Taiwanese EPA adopted its current “Zero Waste Policy”, setting targets to reduce landfilling and later too incineration, leading to an action plan for reduction in 2005. (Allen n.d.; Lu et al. 2006; Pariatamby and Tanaka 2014) Consumers were since 2006 also required to separate recyclables from general waste, risking a fine of NTD1,200 to 6,000 for offenses, which is currently outlined in the Waste Disposal Act Article 50 and 12. This followed successful policies of similar nature at municipal level in several places. (Chiu 2004; Solid Waste Disposal Act 2013)

In 2010, the EPA started promoting the C2C philosophy, which pleads for a circular economy and essentially focusing on fundamentally contributing positive elements, rather

than reducing negative elements, to the environment, through product and service design (Pariatamby and Tanaka 2014; McDonough and Braungart 2002) In 2012, the EPA became part of the C2C Strategic Alliance, led by the consultancy company that invented the philosophy and actively leads the alliance. As a promotion effort for example, in 2014 the EPA organized a design competition with financial remuneration of up to NTD310,000 (“Win Yourself A Prize with Innovative Design” 2014).

A comprehensive map of the organizations in the recycling- and MSW sector was drawn up by Bor et al. (2004; see Figure c). A simplification of this map was also used for further understanding of the framework in chapter 3.2. This figure shows us many of the monetary rewards that are in place in the recycling sector, too; many of these, as becomes clear from the figure, are in place through the market in recyclables, and trickle down through auditors and industry towards the market. What is not fully explained by Bor et al., (2004) is the flow from recycling fund to community. This relates to the deposit system, which was for most goods discontinued early in the 2000s, but still in place for glass.

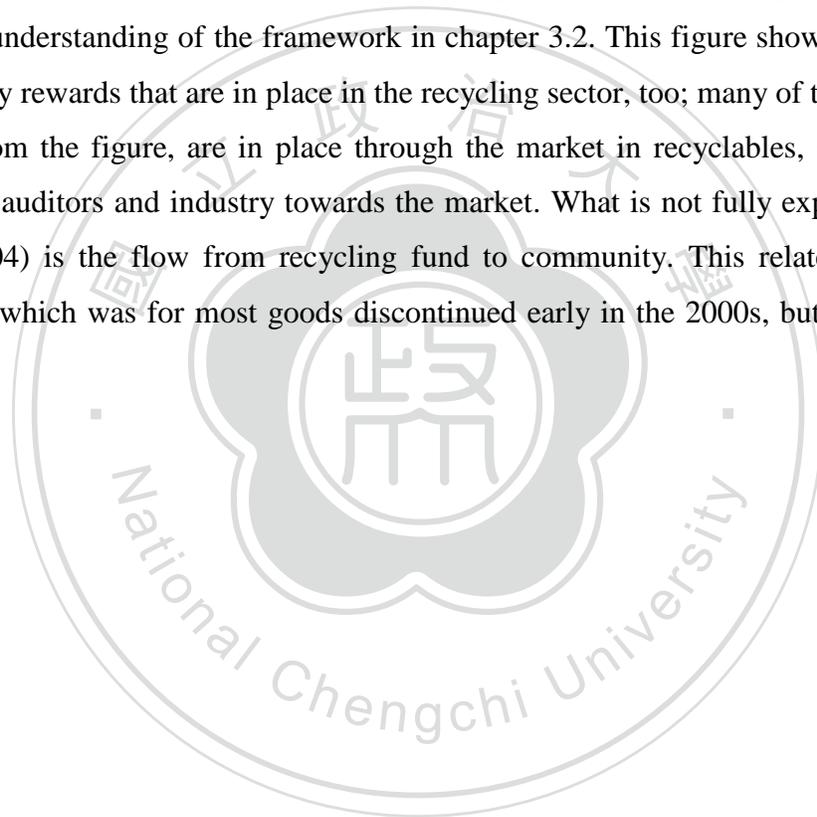
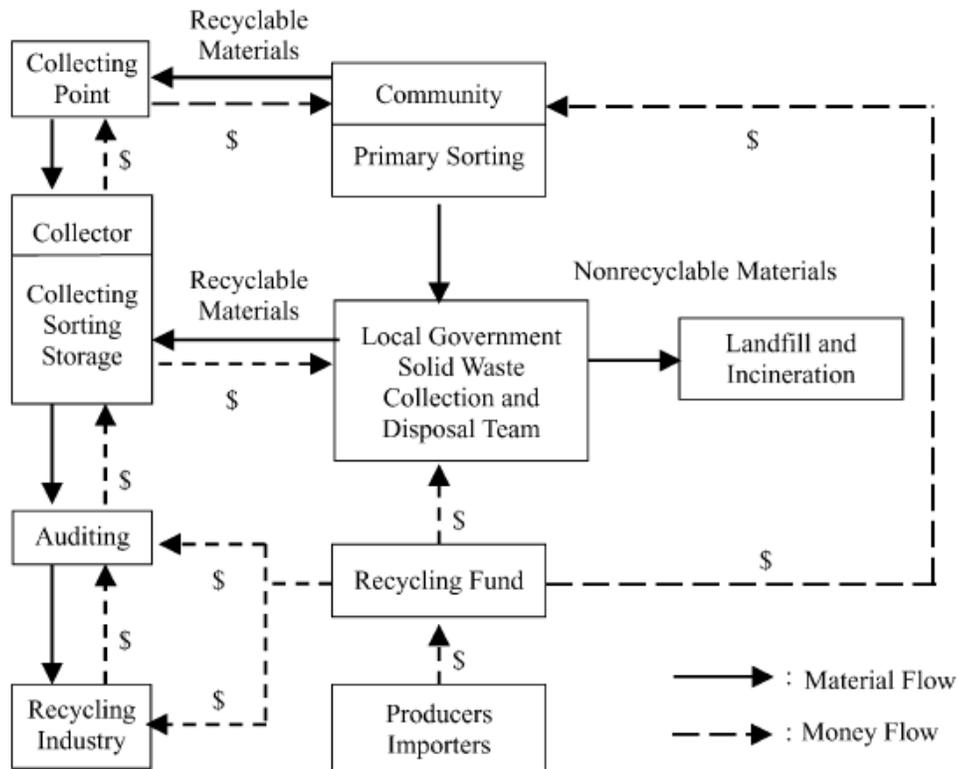


Figure c - Taiwan's recycling sector - Source: Bor et al. (2004)



4.1.2 Collection and processing

Collection of MSW since 1988 is arranged by municipalities and typically done at set times during the week; the community people are since 2006 required to hand in their garbage, separated from recyclables, in person at the truck. These hand-ins subsequently get checked by the recycling truck personnel and refused if not according to sorting standards (Lu et al. 2006; Pariatamby and Tanaka 2014). Since the implementation of the 4-in-1 recycling system, the proceeds from recycling are used to reward communities, responsible organizations and collection crews (Lu et al. 2006). For recyclables, an early unsuccessful attempt was made in 1990 to make communities recycle by installing collection bins in several neighborhoods (EPA 2012a).

In Taipei City in 2000, a Pay-As-You-Throw economic incentive system was implemented, where community members pay for regular waste bags, the only bags that are accepted by the municipal garbage trucks, and handing in recycling is for free. As

such, sorting of wastes is encouraged, and generation of non-recyclable waste is discouraged (Lu et al. 2006). In theoretical terms, this is a perfect example of the collaborative approach; it is mandatory to do recycling, and also made beneficial to do so.

There is, however, still a private sector collection channel for recyclables, which is rarely described in both English-level literature and official statistics. From empirical observation, it seems clear that lower-level informal collection is a very common thing; in many neighborhoods around Taiwan, people can be seen collecting recyclables at roadsides and around municipal collection points. Very little is formally documented about these private collectors in literature, but one needs to visit Taipei only one night to observe that their activities are common and widespread. From reports by several news outlets it becomes clear that private small-scale recyclable collectors are mostly part of the lower-income layers of society, using recyclable collection as a means to provide themselves with at least minimal level subsistence, and that this is a relatively old practice said by some to have flourished before Taiwan's current, public-led recycling sector emerged.

The only brief academic analysis of scavenging and roadside collection of recyclables in Taiwan that was found is a Master's dissertation and dates back to 1996 (Yeung 1996). This thesis describes how, at the time, PET bottles were collected by scavengers and sold to local collectors, who were officially contracted by the appropriate parties to take these back; this leaves an important function for them, despite this author also pointing out that their role has reduced since recycling became a government directed activity.

Estimations on the size of the private sector collection in terms of employment differ heavily. Hsu et al. (citing their own works from 1998 and 1999 in Bor et al. (2004)) estimate from survey research that job opportunities provided by businesses that focus on waste packaging containers, merely in the collection and sorting part, equaled around 15.816 in 1998, with 96.79% provided to people with education levels of senior high school and below. For the same year, Hsu and Kuo (2002) estimate the total employment opportunities provided by collection and sorting to be at 182.538, over ten times the number the previous study reports.

In terms of waste processing and recycling, by far most seems to be done by government organizations when considering official statistics. Statistics from EPA show that in 2015, government services collected and disposed of 7,228,217 (EPA 2016a) metric tons of MSW, of which 3,373,190 tons (rounded) (EPA 2016a) was recycled by government agencies. Other officially verified volumes of recycling add up to 683,812 tons of recyclables processed in the same year (rounded; calculated from statistics by EPA (2016b)). Figure d through g provide an overview of processing methods employed by government agencies and their share of total collected MSW, for the period 2001-2015 at 5-year intervals. (note: earliest statistics available were from 2001, so this data was taken instead of 2000.; 0% in 2010 and 2015 comes from 'other' processing methods. Numbers include kitchen waste and bulk waste recycling, which were initiated in 2003 and 2005 respectively and thus partly explain the jump in 2001-2005)

Terminology in the Taiwanese EPA's statistics was experienced as sometimes confusing; there is for a document showing numbers that relate to "Disposal of Municipal Solid Waste", of which the 'recycling' numbers do not fully match the numbers presented under "Certified Recycling Volume". For the visual display in the figures d-g, the numbers in the document "Disposal of Municipal Solid Waste" were used.

These figures show three things about the public Taiwanese MSW sector that can be concluded. Firstly, recycling has gone from being the third method of disposal after landfilling and incineration, at only 12.68% of the total in 2001, to being the method accounting for the largest share of waste disposal at 55.23% in 2015. This is in accordance with the Resource Recycling Act, Article 6, which stipulates that recycling is preferred over energy recovering (incineration) and means such as landfilling (Resource Recycling Act 2009).

Figure d - Total MSW disposed of: 7.228.217 metric tons- Source: own figure. Statistics: EPA [2016a]

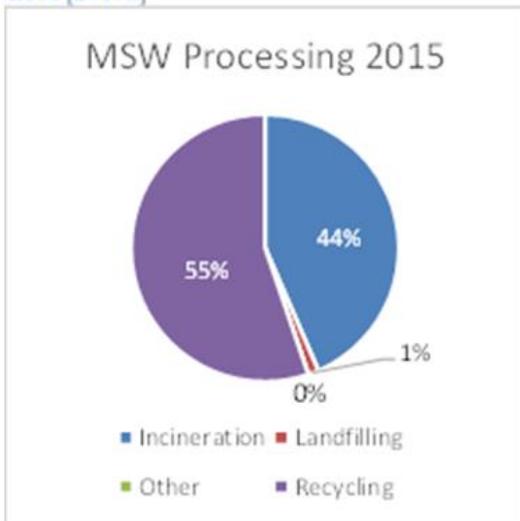


Figure e Total MSW disposed of: 7.957.601 metric tons- Source: own figure. Statistics: EPA [2016a]

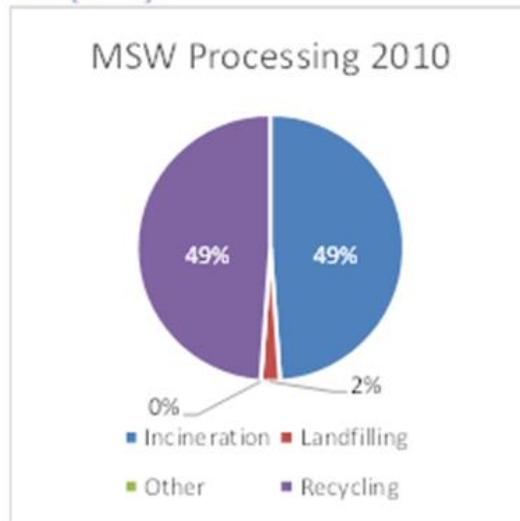


Figure f - Total MSW disposed of: 7.828.685 metric tons - Source: own figure. Statistics: EPA [2016a]

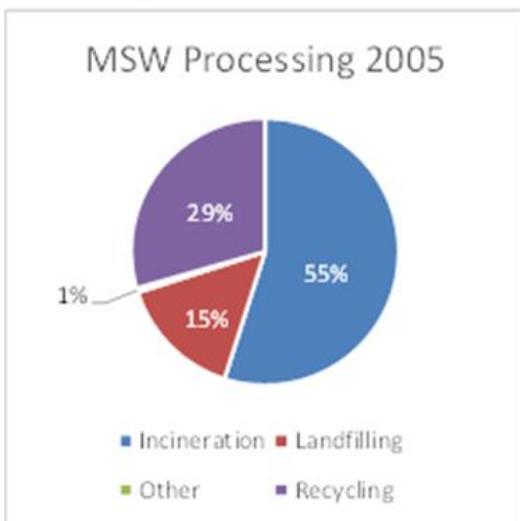
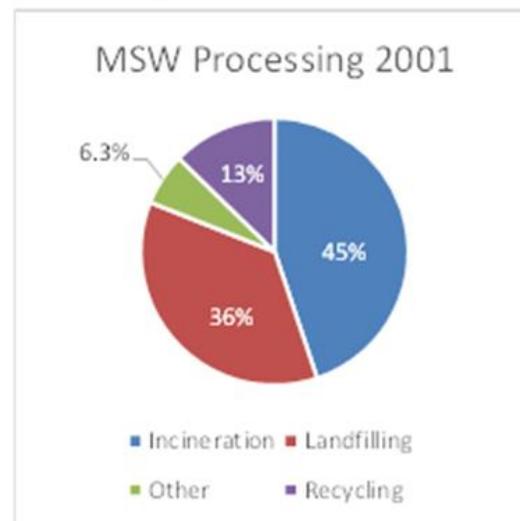


Figure g -Total MSW disposed of: 8.333.806 metric tons - Source: own figure. Statistics: EPA [2016a]



Secondly, it is clear that though incineration has decreased in relative importance as a disposal method, it still is the second preferred method at 43.48% of total waste disposal in 2015; quite likely, this is explained by related economic benefits. Taiwan itself does not possess many means of generating energy, and currently leans on imports for vast shares of its energy generation (e.g.: in 2014, Taiwan relied on petroleum products, of which it does not generate its own, for 48.18% of its energy generation (EPA 2016c). Moreover, the energy generating incinerators represent an already made investment by both private investors and government; abolishing these may lead to protests, lawsuits and other unwanted consequences.

Figure h - Total recyclables collected and sorted by government agencies. Source: own. Statistics: EPA (2001-2015); Lu et al (2006) (1997-2000)

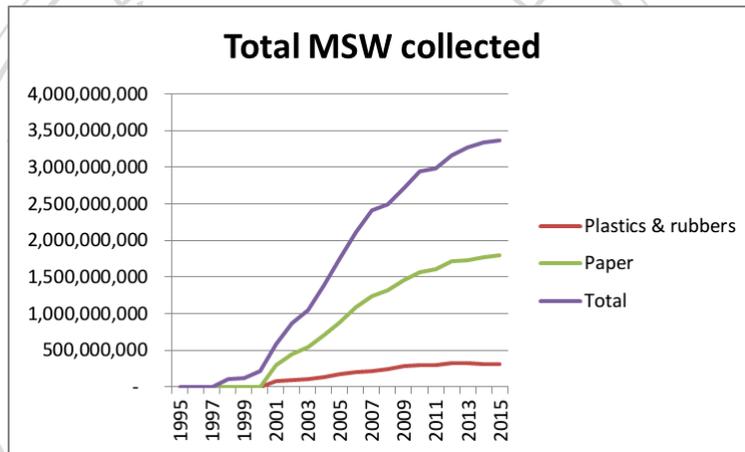
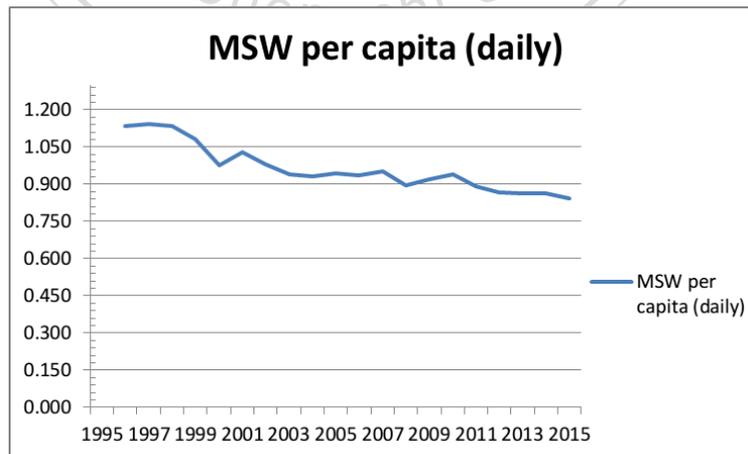


Figure i – Daily MSW per capita. Source: own. Statistics: EPA (2001-2015); Lu et al. (2006) (1996-2000)



As an observation from the total figures, figures h and i, Taiwan has managed to bring down its MSW production over 2001-2015 by 13.27%, an impressive decrease of 1.029 kilograms per capita per day to 0.844 kilograms per capita per day. This is the result of effective communication, mandatory recycling, and the earlier mentioned PAYT system in both Taipei and New Taipei City.

4.2 The Tzu Chi Foundation

The Taiwanese Tzu Chi (慈濟) compassion and relief foundation was founded in the 1960s on the east coast of Taiwan, in Hualien. According to stories, it started with a Buddhist nun, now often referred to as the Venerable Master Cheng Yen, who became a Buddhist and lived in Hualien after her father's death. Several stories are told as to how she came to initiate the Tzu Chi Foundation. The dominant story seems to be one where she observed, as described in Ho (2009), an aboriginal woman being rejected help in a hospital because she could not afford the safety deposit of US\$200. After this, she and her fellow nuns decided to start saving and donating small amounts of grocery money on a daily basis: around 0.02 USD a day. This practice spread through and across the Taiwanese counties and eventually led to establishment of the Buddhist Compassion Relief Tzu Chi Foundation in 1966.

Over the years, the organization grew and grew. The author mentioned earlier, Gary Ho (2009), describes how the organization developed from a few hardworking nuns and housewives supporting less fortunate families, into providing relief efforts starting from the 1970s, into the organization that in 2009 had around ten million members and one million volunteers worldwide, and is known as an influential body with a yearly income of several hundreds of millions in USD (Ho 2009). Along the road, the organization has expanded into a multitude of countries; remarkably also into countries that are predominantly of religions other than Buddhism, and even into the CCP-ruled mainland since 1991.

4.2.1 Beliefs and values

The organization is obviously heavily inspired by Buddhist values and brings together lay Buddhists. Teachings of Master Cheng Yen, that guide members of all the organization, are heavily inspired by the idea of Bodhisattva and Mahayana Buddhism. Self-sacrifice and guidance on the way to enlightenment are crucial values within this. As a part of the Tzu Chi organization, Cheng Yen also leads a group of nuns and monks that desire to dedicate themselves to Buddhism (Ho 2009).

Despite this religious nature, Tzu Chi is still most often viewed as an NGO, despite some definitions explicitly excluding religious organizations when talking about NGOs. This can be justified through three reasons. Firstly, the Tzu Chi communicates, more than religion, values *deriving* from its religious core, which is an important nuance. As a result, its aim is not necessarily to convert or recruit new Buddhists. Secondly, the organization itself is open to members of any religion as long as they uphold these values; in some other countries, the members and volunteers are for example mostly Muslim. Thirdly, in its disaster and relief operations, volunteers are explicitly instructed *not* to attempt to convert people to Buddhism, a point that quite likely has helped a great deal when Tzu Chi first moved into China in 1991.

At the core of the organization's ideology are three goals, set by the Venerable Cheng Yen and related to Buddhist teachings: to purify people's hearts; to bring peace into the world, and to end disaster. Its approach is very much centered around Cheng Yen's- and by now some of the Tzu Chi members'- charisma, which is used to inspire movements within communities. This bottom-up approach relates to the belief that it is key to dedicate oneself to helping nature and people laboriously.

Cheng Yen's charisma has been the topic of extensive analysis by Huang (2009). She defines this 'charisma' as "*a quality that appears in the interaction between a magnetic person and others, one that often has a far-reaching impact on those who are engaged in it.*" (Huang 2009, p. 38) Promotion of this charisma, she points out, has led to glorification, such as the members of the Tzu Chi Foundation referring to the Venerable

Cheng Yen as *shangren* (上人) or ‘the supreme person.’ However, the charisma is not used with the goal of success, but rather with the goal of ‘the experience.’

4.2.2 Organizational structure

Most Tzu Chi Foundation volunteers operate on a fairly self-governing basis, often starting projects in their own communities, but let themselves be led by the principles outlined by Venerable Cheng Yen and supported by the nearby liaison office (Mohamed 2012b). These liaison offices are by now present in around fifty countries and activities are global; most liaison offices are established in a similar way as projects are started, first as something spontaneous and informal, but later officially recognized by the main office in Hualien (Huang 2001).

The organization is in effect an umbrella organization, with the Venerable Cheng Yen at the top; her philosophy and charismatic leadership is at the core of the organization’s decisions (Huang 2001; Huang 2009). Many examples and anecdotes given throughout the literature and in Tzu Chi’s own magazine *Tzu Chi Quarterly* describe how people donated their own plots of land and money, and put in labor, out of respect and praise for Venerable Cheng Yen’s purposes and personal example (e.g. see Huang 2001; Huang 2009; Ho 2009). This is what seems to make the organization very strong in motivating grassroots movements, which is part of what the organization and specifically the Venerable Cheng Yen aim for.

Halfway through the 1980s, as a result of rapid growth, the Tzu Chi Foundation started to institutionalize and custom-make its own managerial system, resulting in a system where a managerial system, led by several layers of managers with Venerable Chen at the top, overlooks operations of the different mission offices; at the time of designing this system, these missions concerned were education, culture, medical help and charity (Huang 2001). Since then, the number of missions has increased to eight as the organization mentions on its website, adding on to the previous four with international relief, bone marrow donation, environmental protection and community volunteering.

As a result of aforementioned transformations, the Tzu Chi umbrella organization became a combination of two organizations: the Tzu Chi Merit Society, which is the volunteering organization, and the Tzu Chi Foundation, which is the non-profit organization that hires staff in its mission offices. The way in which the Merit Organization and the Foundation interact seems to be different; there is no clear hierarchy or structure between the two, as Huang notes (2009). Of the foundation, the CEO is Cheng Yen, who as a result takes final decisions on the organization's actions with three vice-CEOs heading the three mission offices Cultural, Medical and Educational (Huang 2009). The last publication observing the organization structure was however from 2009; the missions have changed as mentioned earlier and as a result, the organizational charts may have transformed as well.

The non-profit Foundation however would be nothing without the contribution from the volunteers of the Merit Organization. Tzu Chi volunteers coordinate their activities with the corresponding mission center. Within the Merit Organization, amongst the volunteers, there are differentiated levels in the hierarchy, depending on seniority and money and time contributed to the organization's activities. A comprehensive overview of roles and positions in the Merit Organization is provided by Huang (2009).

An important group to point out here are commissioners, who stand higher than volunteers in the Merit Organization, and are thus a desirable position. Commissioners typically wear the Tzu Chi uniform, consisting of a navy-blue polo shirt and white pants. They are the religious followers, expected to provide an exemplary role, and typically key in establishing a local Tzu Chi branch (Huang 2009).

Despite its now considerable size, the organization refrains from having formal ties with politics; its philosophy dictates that its members should focus on more direct, on-the-ground help (Laliberté 2004). The latter it often provides through emergency aid after disasters, but also through more structural projects such as its recycling activities and setting up of schools, hospitals and living facilities in areas that are in need of these. Nevertheless, the Tzu Chi Foundation does cooperate with governments to achieve its goals, but while doing so *“neither (flatters) nor (criticizes) the authorities.”* (Laliberté 2004)

Nevertheless, when the organization reached a scale on which it nearly had a ‘monopoly on philanthropy’ in the 1990s, it garnered a lot of critique from around society for its monetary means and multi-million dollar fundraisings. Critique supposedly focused not so much on the organization’s actual spending, but rather about the size of its wallet. This resulted in the organization becoming much more opaque about its financing, whereas previously transparency about the size and destination about the Foundation’s funds were stressed (Huang 2001).



5 Case description: Tzu Chi's recycling

This chapter will outline the information gathered from interviews, external media sources, and Tzu Chi's own sources, to put together a narrative of Tzu Chi's recycling of plastics and paper in Taiwan. The next chapter will then analyze this case using the theory provided in the literature review section of this thesis. The case is constructed using outside literature, media reports, 27 reports from the Tzu Chi Quarterly, statistics from 20 of the Foundation's annual reports and four interviews. These are used initially as evidence and for understanding of the case; in Appendix 2, a coding table is furthermore provided to show relevant quotes and citations that back aspects of the case.. To provide more background than regular referencing, this table also shows the edition of the Tzu Chi Quarterly or interview the quote was in, the author and translator of the piece, and finally the quote itself. This as such allows for scrutinizing by other researchers.

5.1 Early recycling

The Tzu Chi's recycling story starts in 1990 in Taichung ("Environmental Protection Starts at Home" 2010). The event that truly marked the start, mentioned by all sources, was a speech by Master Cheng Yeng on August 23, 1990 at a business school in Taichung. In the stories told and documented now, she is quoted by the Foundation's own sources and this research's interviewees as well as outside media to have stimulated Tzu Chi volunteers to "*start recycling with your clapping hands*" (Daai Television 2010; O'Neill 2010, p. 167; "Environmental Protection Starts at Home" 2010; Tzu Chi Foundation 2012; Mohamed et al. 2012, p. 146; See Appendix 3, no. 1). The speech was, according to current stories, on a different topic; however, on the way to the venue, Master Cheng Yen observed a street littered with garbage. Finding this absolutely despicable, she felt the need to address it during her lecture that day, aiming to get people to recycle. Recycling for the Foundation has since meant collecting, sorting and accumulating volume, to speak in terms of Wilson et al. (2006).

Interview respondents mention that recycling subsequently started in the backyard of one Tzu Chi member, who effectively was the first recycling volunteer. This is very illustrative of Tzu Chi's grassroots stimulation approach, which uses Cheng Yen's

teachings to inspire small, community level movements that are meant to snowball into larger movements, that was mentioned in last chapter. Remarkable is that this anecdote of the speech, followed by grassroots movements, is the only aspect of the time between 1990 and 1995 that is widely documented. All interview respondents, as well as sources concerning this period, tell the same stories in somewhat differing levels of detail but with the exact same storyline.

Empirical data at this point is scarce, as the Tzu Chi yearbook did not appear until 1992, where it did not contain recycling statistics until 1995. The Tzu Chi quarterly is available as far back as 1996. Interviewees, too, are no more than vaguely familiar with this period, either because they had not yet started volunteering or because it is too long ago for them to fully remember. O'Neill (2010) however, provides a collection of stories gathered from inside the organization that provide some insight into this time.

O'Neill (2010, pp. 166-169) describes how Tzu Chi's recycling rapidly expanded after the speech. Supposedly a month after, a young volunteer told Cheng Yen that she had started recycling paper, cans and bottles from local families, which earned her NT\$5,000 to donate to the Tzu Chi Foundation. An entire village followed her example, collected recyclables and gave these to a local Tzu Chi commissioner to sell, which earned a donation for the Foundation worth NT\$8,000. Upon hearing these successes, Master Cheng Yen urged other members of the organization to start recycling too. Over the following years, the Foundation's recycling rapidly established itself, developing into the 'Confirmation'-stage of Mohamed et al.'s (2012; 2012b) recycling innovation classification system.

He furthermore continues to sum up Cheng Yen's goals through pushing for recycling, which are roughly two-fold. Firstly, she aims to save the earth's ecological system from destruction by mankind's greed. Secondly, she aims to make people practice the Foundation's Buddhist ideals: to make members provide firsthand support on the path towards world-improvement (O'Neill 2010, p.166). In addition to regular volunteers, commissioners are required to spend a part of their time as volunteers for the Merit Organization, part of which is spent recycling, and enjoy a higher position in the social hierarchy (See Appendix 3, no. 2).

In summer 1996, the Foundation reports 100 recycling points in only the Tainan region (Tzu Chi Annual report (慈濟年鑑) 1995; additionally, see Appendix 3, no. 3). This was during the period where national recycling was not completely documented; processing of recyclables was often done on a buy-back basis of packaging by the original producers, importers or retailers for those materials that fell under the EPR arrangement described in chapter 4.1.2. It is not clear through which channels the Tzu Chi Foundation sold their recyclables at the time: either the original producers of packaging or wholesalers and traders.

A lesson that the recycling stations learned quickly was that well-sorted and well-packaged recyclables fetched a higher fee than unsorted recyclables (Appendix 3, no. 4). This goes beyond the level of sorting plastic from paper from aluminum cans: different plastics are separated and even paper is cut up to separate the blank segments from the printed parts. As such, most of the Foundation's recycling plants continuously seek to maximize the fees they receive for the recyclables that are channeled away through the market. Appendix 3, no. 4 shows quotes from five stories in the Tzu Chi Quarterly that convey this, and a volunteer mentioned the same in one of the interviews.

During the 1990s, a few reports indicate that street-sweeping was a maintained way of collecting recyclables (Appendix 3, no. 5). After, the collection seems to have taken place partly from local small or medium enterprises (SMEs) such as shops, market stalls and partly from collection points within the community, providing a relatively convenient way of recycling at the time, and lowering the barriers to recycling. This is the strategy that was still found to be in place right now, during visits and personally shadowing and supporting the recycling teams.

At the end of the 1990s, in 1998, DaAi Television Channel was established nationwide in Taiwan and later worldwide. At this point the income gathered from recycling was used to fund this TV channel, which operates exclusively on the Foundation's funding; no direct corporate sponsors and thus no paid advertisements are accepted. The recycling income is thus an important way of funding what quite possibly has become the biggest communication channel of Tzu Chi's cultural mission- and also the rest of the Foundation- to the rest of the world.

Before the establishment of DaAi Television, it was less clear for what purposes Tzu Chi's recycling income was used, as the finances of the Foundation since the early 1990s are inaccessible to the public. Early proceedings are mentioned in the Tzu Chi Quarterly of 1997 to have been donated to the Tzu Chi Construction Fund; some other volunteer funds also seem to have received money. Quite certain is that the funds were already a significant source of income; the Tzu Chi Quarterly reports a NT\$11.9 million revenue for the Tainan region alone in 1995 (Appendix 3, no. 6).

Thus, since the beginning of Tzu Chi's recycling, the organization has focused on collecting recyclables, subsequently sorting them and packaging them, effectively preparing them for re-use as resources by industry with the market as a mediator. This means that overtime, some recyclables may run into problems; one interviewee told that currently, due to extremely low oil prices, it is impossible to find parties that procure soft plastics, and these are thus thrown away.

The collecting is typically done within the local community, by connecting with both small businesses such as markets, restaurants and shops and households. These subsequently sort the recyclables, and depending on the deal made may have the recyclables picked up by Tzu Chi volunteers or they bring them to a central collection point. Typically, these are then transported by truck to a recycling station. In the case of the Neihu recycling station, the recyclables were picked up by Tzu Chi on a night where the government does not do pickup, so as to not collide- and provide an alternative for community members that are not available during government pickup times.

This localized approach correlates with the organization of the recycling stations, which are largely autonomous. They firstly set up their own collection. Stations do their own experiments with new recyclables, and decide to visit other stations for learning opportunities, through their own organization. It is, however, true that there are many stations that are set up by volunteers and commissioners that have gained experience at other stations; in this way, knowledge between stations is exchanged and many stations copy common practices.

In the early 2000s, Tzu Chi's recycling continued to expand. Using its ever-growing base of recycling volunteers and an increasing number of recycling stations, the Foundation recycled 10.70% and 10.62% of what government recycled in 2002 and 2003, respectively (See figure k in subchapter 5.3). Government agency recyclable collection grew at a higher pace than the Foundation's recycling, however. Figure k in subchapter 5.3 shows that the Foundation recycled over 50% of what the government recycled (all recyclables; plastics and paper are unknown at this point) in the first year EPA reportedly started collecting recycling. This quickly diminished to a rate below 10% for plastics, papers, and the total for all classes before 2005.

5.2 The formation of Da.ai Technology Corporation

In 2006, Tzu Chi expanded its recycling activities beyond sorting and recycling. As described by two of the interviewees, in this year, some Tzu Chi recycling volunteers and commissioners that were experienced businesspeople observed Tzu Chi members in Indonesia setting up an entrepreneurial project to clean one of the main rivers in Jakarta.

This, as it was mentioned during one of the interviews, (Appendix 3, no. 7) inspired them to initiate a structural project focusing on textile fabrication out of PET-bottles, also to look at means to improve the actual use of recyclable resources. Using existing technology to build upon, this was successfully developed into a way of making blankets used for emergency operations.

From the initial movement, the volunteers invested their time and money in establishing Da.ai Technology Corporation in 2008. This company, that was initiated legally separate from the Tzu Chi Foundation, formed coalition of textile industry actors, to successfully make useful textiles out of PET-bottles, something that was previously not yet possible. Their current products range from relief operation blankets, to clothing, to carpets, to medical textile products, and are under continuous development by its R&D department.

After setting up this company, the volunteers that initiated it donated its profits back to the Tzu Chi Foundation, and their initial investments too were donated to the Foundation. This means the organization now formally too is under Tzu Chi's control, as it's the only

shareholder. Yearly, Da.ai donates its profits back and the company as such describes itself as a non-profit company. The interviewees from Da.ai Technology mentioned also that it is selective in its projects, looking for things that fit with its ideals. Occasionally the company donates its profits from a project back to a client, for example when it was working with another NGO that provided paid jobs to people with learning difficulties (Appendix 3, no. 8).

As the interviewees at Da.ai Technology mention, the company operates mostly independently from the Tzu Chi Foundation however. Despite being what they term a non-profit company, they operate on the basis of a business model; earning money and selling products is their right to existence. Yet the guiding principle, as described above, within this is to do moral business. One interviewee described that one of the ideas was to provide managers and businesspeople an opportunity to contribute by something more than solely donating money (Appendix 3, no. 9).

An important aim since the founding of Da.ai's existence is not only business development; it is development and pioneering of different technologies that increase attractiveness of recycling. Da.ai was one of the first to gather attention for PET-recycling technologies that produced usable textile, developed based on earlier technologies (Appendix 3, no. 10). This subsequently became 'big business' in Taiwan; to illustrate, nine football teams during the 2014 FIFA World Cup wore shirts that were made out of recycled PET-bottles, made by Taiwanese companies though not by Da.ai ("Nine World Cup teams play in Made-in-Taiwan uniforms" 2010).

Information from media sources and other companies' websites contests that Da.ai was the first in Taiwan to develop PET-fabrics, saying that the technology has been under development since roughly halfway the 1990s or according to some even the late 1980s (Super Textile n.d.; Yang 2011; Chung 2014). However, even companies and entrepreneurs involved in this are quoted mentioning the key role of the Tzu Chi Foundation and Master Cheng Yen's message in promoting PET-recycling, and the leading role that Da.ai has taken in the industry since its establishment (Chung 2010; Yang 2011). Moreover, many are keen to point out the unique purity of Tzu Chi's sorted PET-bottles, which is crucial for producing textiles; the difference at Da.ai's initial stage

was made by sorting the caps and the rings from the bottles, which Tzu Chi volunteers do by hand (Chung 2010) (See Appendix 3, no. 11).

Da.ai Technology is, just as any company, a paying employer. Its interviewed employees however mention that for some working for the company is not so much a salary choice. It seems that especially for more senior workers, salaries at other (recycled) textile companies lie much higher. Instead, the feeling of working for a company closely related to the Tzu Chi Foundation is said to be an additional incentive by one of the interviewees (Appendix 3, no. 12). It must be noted too that many of the employees at Da.ai Technology were also said to be volunteers for Tzu Chi during their free time.

Since working on textiles made from PET, Da.ai has continued to increase its range of recycling technologies. Currently, they have projects focusing on retrieving oil from plastic products, making plastic into wood substitutes used in for example garden furniture, and on recycling used textiles. Moreover, many of the support materials they use abroad, such as foldable beds and prefabricated houses, are made and developed further by Da.ai.

5.3 Recycling since 2006: new goals

In 2006, news of Tzu Chi's efforts to turn PET-bottles into textiles spread rapidly and both led volunteers to work harder towards collection of these, while also increasing willingness of community members to separate and donate their PET-bottles to the Tzu Chi Foundation. This is what is pointed out by an interviewee as the reason for a rapid increase in plastics recycling by the Tzu Chi Foundation in 2006 (Appendix 3, no. 13). Tzu Chi is indeed commonly recognized as the pioneer, after successfully developing recycled PET-based textiles in Taiwan (“垃圾分類造永續 環保公益遍全球” 2016; “寶特瓶也能做衣服” n.d.).

After 2006, government and private recycling efforts increased significantly when the 4-in-1 recycling plan had successfully been established, several regulations restricting plastic containers were implemented, and the Zero Waste Policy was accepted. Tzu Chi's recycling quantities of plastic, paper and the total, nominally decreased after 2006 (See

table 13 in Appendix 3 and figure j). Around the same time, market competition for recycled products increased, which can be partly attributed to Tzu Chi's display of the business potential of recycling technology, and the advances it made in technology. Recent media reports underline this boom in recycling industry; The Diplomat reported an increase from \$840 million USD in 2003 to \$2.2 billion USD in 2013 ("Taiwan's Recycling Boom: A Shining Example for Asia, the World." 2013). The competition in the market for recyclables subsequently increased, in turn reducing Tzu Chi's share of paper, plastics and even total recyclables. The Foundation and Da.ai Technology however are reportedly positive about these developments, as it is in line with their aim to increase participation in recycling (Appendix 3, no. 14).

Figure j - Tzu Chi's recycling. Numbers are in kilograms. Note: in 2001, no total number was published, and due to inconsistencies in reporting format this could not be calculated. Source: own. Statistics: Tzu Chi Yearbook (1995-2015)

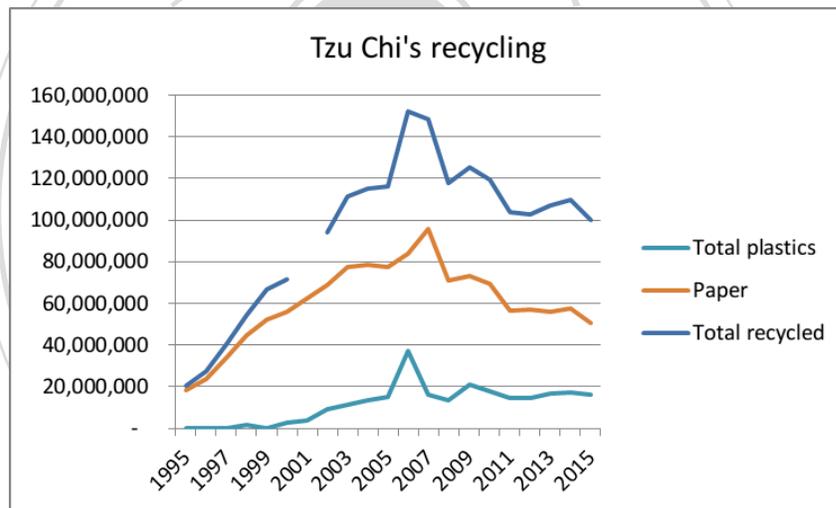
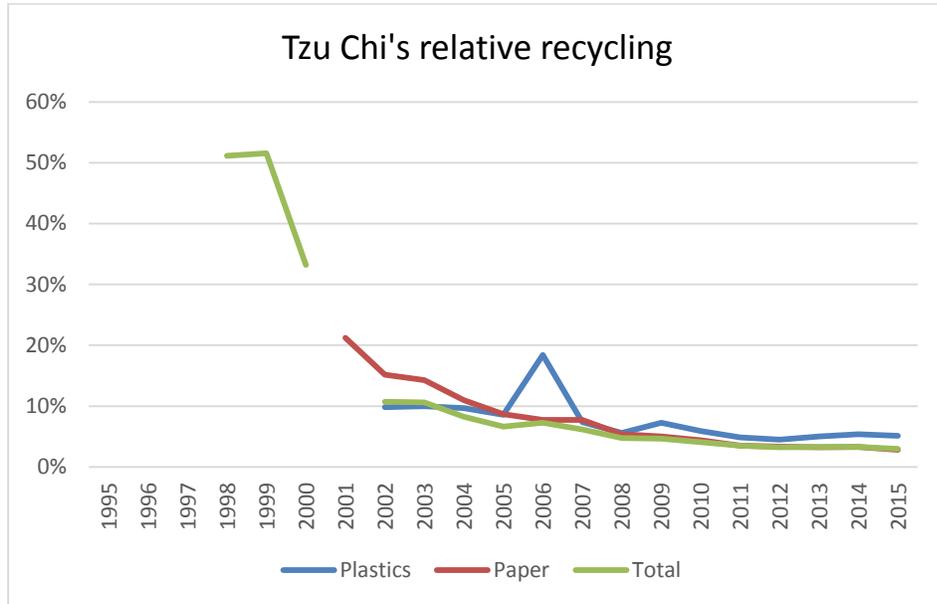


Figure k - Tzu Chi's recycling as a percentage of recycling by Taiwanese government agencies. Note: this is a relative measure; government numbers do NOT include Tzu Chi's recycling. Source: own. Statistics: Tzu Chi Yearbook (1995-2015); EPA (2001-2015); Lu et al (2006).



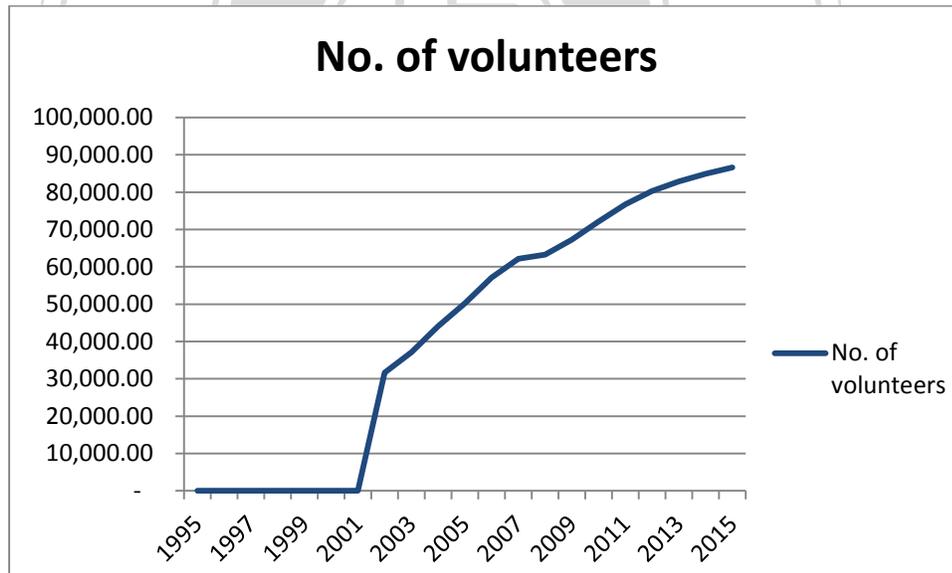
At the same time, for community, interviewees and a media report by the Taipei Times (Lin et al., 2014) show that the Tzu Chi Foundation has had more trouble motivating community members to get behind their goals in recent years. Lin et al. (2014) summarize allegations that the Tzu Chi Foundation competes with scavengers, relying on its volunteers, and are in line with an increased trend of resistance described by one interviewees and mentioned during observation and participation at the recycling station. Over recent years, several collection points in the neighborhood that was studied had to close down over complaints of smell and noise (Appendix 3, no. 15).

Since 2006, the goal has become not so much to increase recycling activities anymore, which is reflected in the numbers of total recycling and paper. Plastic has remained similar. Instead, sorting has improved, and the Tzu Chi Foundation aimed to focus more on education of community members, who regularly visit the plants in tour groups (Appendix 3, no. 16). This education, too, has evolved from procedural instructions about recycling provided at the recycling station, to communication of a message of both resource reduction and recycling since approximately 2010 (Appendix 3, no. 17).

The Neihu recycling center, as one early example, has set up an elaborate education center around 2010. In this center, tour groups are introduced to the Tzu Chi Foundation's message and its activities through a series of interactive expositions. One of the volunteers reports that this became normal at other recycling stations as well, in order to inform visitors about the Tzu Chi's philosophy, activities and environmental and consumption views.

The only number that has without fail increased since the Tzu Chi started recycling in 1990 is the amount of volunteers that focus on recycling (See figure 1). This depicts quantitatively a quote from one interviewee, who pointed out that for volunteers, recycling has become much less about the work, but more about it being a social activity; suggesting that actual quantity of recyclables was less important to them (Appendix 3, no. 18).

Figure 1 - Number of Tzu Chi volunteers active in Taiwanese recycling. Note: numbers before 1997 are unavailable. Source: own. Statistics: Tzu Chi Yearbook (1997-2015)



5.4 A new model: Cooperation in Pingdong City

The Tzu Chi Quarterly of winter 2014 gives a detailed description of a smaller-scale case that marks a completely different approach from what was- and still is- common in Tzu Chi's recycling. Both the (Chinese-language) China Times and CNA provide additional

coverage of these events (Hesheng Lin 2014; “屏東市里長盼資源回收繼續” 2014). Whereas the organization since the inception of its recycling operated separately from the central and local governments, the Foundation started cooperating with the local government to collect recyclables. Once every week, 100 collection points are set up throughout the city. Here, residents are also informed by Tzu Chi volunteers on how to sort and clean their recyclables; a part of the points are run by private collectors and scavengers (Appendix 3, no. 19).

This cooperation was implemented in 2014, after the municipal government had dealt with problems finding a successor to its recycling collection contractor. According to the TCQ, (Appendix 3, no. 20) the government provided trucks, which the contractor paid a set fee for; the remainder was for him to use to hire personnel and as profits. However, reportedly profits fell below break-even levels, as a result of which the contractor was left unable to continue his services. In the process finding alternative disposal methods, and due to high cost unwilling to set up its own collection teams, the city government decided to request help from the Tzu Chi Foundation. This was reportedly fed back with Master Cheng Yen, who agreed with the project as it allowed to involve and educate more people in recycling, which was deemed in the organization’s interest.

Figure m - Recycling in Pingdong over 2008-2015. Source: own. Statistics: EPA Pingdong County Government (2009-2016)

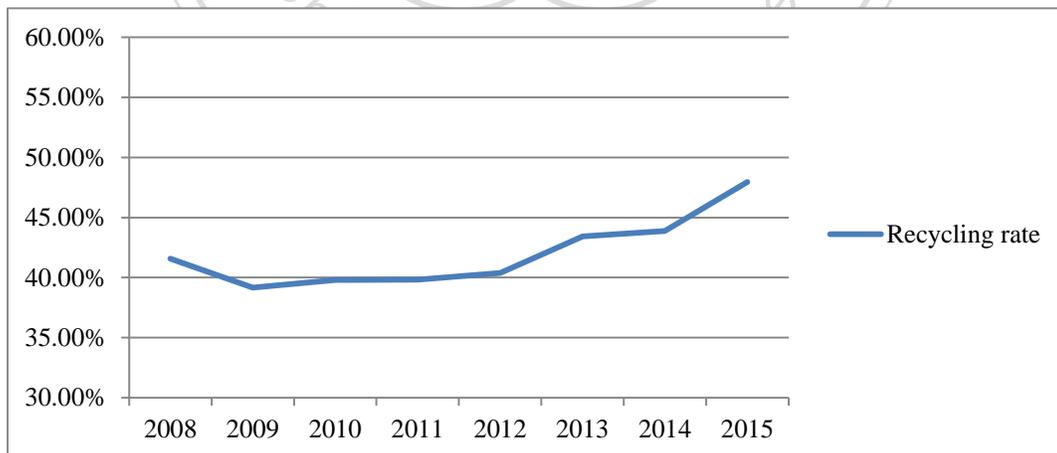


Figure m shows that, as a result, there was growth in the recycling rate over 2013-2015; a growth of 4.51 percentage points to 47.95% in Pingdong City. Looking at the seven year trend this is a fairly sudden and significant jump. Despite already existent growth, the

cooperation meant a fundamental reform of the recyclable collection system, and shows itself to be more effective than before.

A significant downside, although not described in the TCQ, could be the jobs that were provided by the private contractor; most of these are no longer available after the work is done by volunteers. Arguably, the city government may have been able to set up a program under which these employment opportunities were kept, though according to TCQ, (Appendix 3, no. 21) this would have cost investment of tax money. Additionally, specific collection points were reserved for private individuals and scavengers; the scale of both are however unknown.



6 Analyses

This chapter will combine all the chapters before to come to an analysis of the Tzu Chi's incentive dynamics and its resulting impact on the recycling sector. First, it will place Tzu Chi's recycling in context, combining chapters 4.1 and 5 to observe incentive dynamics, split over three periods. In-text, the broader Taiwanese recycling sector will be discussed together with the Tzu Chi Foundation's incentives and activities, and at the end of every period's analysis, a table will sum up the incentives, interests, actions and subsequent impacts of the Foundation and its members on recycling success. The analysis will consider incentives for the organization, but without disregarding incentives for smaller parts of the organization; additionally, it will discuss the situation of the broader recycling sector in Taiwan. In subchapter 6.2, this will finally be further scrutinized to come to a final understanding of how Tzu Chi's incentive dynamics contribute to the Taiwanese recycling sector.

6.1 Combining case and context

Within the Taiwanese recycling sector, when observing incentives, four different periods can be distinguished. Firstly, the period before 1988, of which very little is currently known, which will therefore be disregarded. Secondly, the period between 1988 and 1997, in which an EPR Program was put in place. Secondly, the time between 1997 and 2006 when the 4-in-1 Program was implemented. Then finally, the period after 2006, when many new regulations had been emplaced, including mandatory recycling. These periods also coincide with several of the most important changes for the Tzu Chi Foundation, as described in the last chapter.

The analysis in this chapter will distill from the case narratives the variables outlined in chapter 3.2, looking at both the data collected and the broader recycling sector. It will determine the organization's incentives, while considering whether these were in line with the incentives inside the organization, its interests, activities and impact on recycling success of the broader sector. Mainly for the latter, the description of the Taiwanese recycling sector in chapter 4.1 will be crucial input. Important to note, too, is that primary data obtained relates to a number of individuals in the organization; the analysis thus

relies on the information provided by them to be accurate and generalizable. It will also attempt to tie individual incentives to the organization's incentives where possible and appropriate.

Before 1988, waste reduction and recycling were overlooked as options for MSWM by the central government. Despite there being news reports that state there was a small group of recycling firms, very little is known of these; Lu et al. (2006) furthermore stated that no government recycling was taking place during these years. There is one news report from 1991 that mentions a recycled paper industry that exists since 1985, but there is not enough further information available from this period for proper analysis (Yu 1991). This period will therefore be further disregarded from this analysis; whereas informal recycling is relevant to this thesis, information at this point is too scarce to further investigate.

It is however certain that this caused the displays of public littering that in turn caused Master Cheng Yen to mention recycling in her speech, initially with purely ideological goals. These ideological goals included both environmental preservation and first hand engagement of all levels of society in working towards a better world. One of her followers started doing so, quickly followed by others. This small, initial group gained a financial contribution from collecting and selling recyclables, after which recycling rapidly spread amongst Cheng Yen's followers.

6.1.1 Between 1988 and 1997

Between 1988 and 1997, several policy changes had been made however. The government attempted to tackle the problems related to MSW that had been plaguing the country since the rapid economic development. Collection and recycling of specific products was done on a mandatory basis by the original producers, effectively making it financially more attractive for them to either avoid certain regulated materials or to come up with ways of making said materials more recyclable. The central government also started educating the community about recycling and resource reduction. This was without much avail for the latter: daily MSW generation per capita peaked in 1997 at 1.143 kilograms (Lu et al. 2006) .

It seems that unstructured collection and lack of real incentives could not get the Taiwanese community to focus on recycling, which is in line with McCarty and Shrum's (2001) conclusion that convenience is a crucial factor for many consumers when they consider recycling. Municipal collection, namely, was still only for regular garbage; the central government was unable to provide sufficient funds to collect- and further process recyclables in a coordinated fashion (EPA 2012b).

Furthermore, in the early 1990s the central government funded construction of incinerators, which were in the medium term expected to be the main disposal method for MSW. This further drained any funds that could have been put towards recycling for this period, as it was not in their interest to divert from these already-made costs. Later in the 1990s and the early 2000s, local and central EPAs were under fire of numerous NIMBY movements that opposed incineration in their neighborhoods (Hsu 2006).

It was during this time that the Tzu Chi Foundation's activities in recycling were growing to reach their largest relative scale, attempting to improve the above described situation. The speech by Cheng Yen provided a key incentive to start. As mentioned before, recycling activities spread after a successful initial attempt in pursuit of cleaner streets and involving as many people as possible in environmental protection, that also raised money for donation for the Foundation. This combination of ideological and financial incentives was mentioned by all sources (interviewees and TCQ) to have been present throughout the Foundation's recycling history.

Both the private sector and municipal governments do not have any statistics regarding this period, but as a result recycling done by the Foundation grew to a considerable scale, as statistics starting in 1995 showed. For many small shop owners and community members, it was a convenient way of disposing of recyclables in an environmentally friendly way, and a further service was proven by volunteers who cleaned the streets. This in theory must have provided social pressure for community members to support the Foundation's volunteers in their recycling activities, as they saw the effort put in to improve and maintain local living conditions.

In sum, actors during this time were not fully aligned, and most definitely not towards recycling. The central government had reasons to incinerate many types of garbage except for specific classes of recyclables; local community members protested against this in the form of NIMBY-protests; community members were not properly stimulated to sort and recycle, since local governments did not receive means to properly fund collection. The Tzu Chi Foundation, together with the then relatively small private sector, were the only actors that had strong incentives to recycle; both had a financial incentive, and the Tzu Chi Foundation clearly had ideological drivers.

The latter served an exemplary function to others in terms of recycling and took the lead in what it viewed as necessary: recycling. During this “up-and-coming” phase, the ideological incentive and intrinsic value of recycling were key to do it; the financial incentive further enabled and motivated it for the organization. For the individual volunteers, incentives ranged from ideological ones to more social ones such as relatedness. The financial reward for the organization was an extension of the ideological incentive, since the funds were spent towards Tzu Chi’s goals.

Table 8 – Model for Tzu Chi’s actions over 1988-1997. Source: own.

Incentives	<ul style="list-style-type: none"> • Purposive: Ideological incentive to protect environment • Purposive: Ideological incentive to involve as many people as possible in environmental protection • Material: Financial from recyclable purchasers
Interest	<ul style="list-style-type: none"> • Improving participation in- and awareness of recycling • Cleaner streets • Protecting the environment. • Sell recyclables; use funds for Foundation donations
Actions	<ul style="list-style-type: none"> • Trend: Strongly grew number of recycling volunteers, stations and collection efforts
Effect on recycling success	<ul style="list-style-type: none"> • Steadily grew into a large nationwide recycler: quantities until 1998 more than half of the governments’ quantities.

Incentive interaction during periods	<ul style="list-style-type: none"> • Ideological incentive provided by speech was subsequently strengthened by the initial income of recyclables: synergize
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6.1.2 Between 1998 and 2006

With the implementation of the 4-in-1 recycling approach came marked improvements in terms of alignment towards recycling success. As mentioned in chapter 4.1.1, the system involved a recycling fund which was to be funded by retailers, importers and producers of certain recyclables. This is still an incentive to reduce the use of recyclables and potentially design them for recyclability, for those introducing a product into the Taiwanese market.

This recycling fund is centrally managed by the national government. Part of it is used to fund municipal recyclable collection teams, which were from 1998 onwards mandatory for municipalities. The trucks used for recyclable collection, done together with collection of regular waste, are also paid for by the recycling fund. Returns that recycling generate, end up in projects for the communities, organizations and collection crews that are involved in the original recycling. Compared to previous approaches, local and national government were much more aligned, and much more focusing on recycling.

Local municipalities, too, began implementing policies to stimulate recycling, either through a regulatory approach or a ‘polluter pays’ approach such as the PAYT system in Taipei. As a result, the Taiwanese community as a whole had different, municipality-dependent incentives, with different levels of effectiveness. At the same time, the central government focused on further educating consumers regarding environmental protection. This started having an effect, and both daily MSW per capita and the recycling rate started heading in a positive direction.

As mentioned before, industry and auditors got funding from the recycling fund allotted, making it much more attractive to engage in resource recycling. Money subsequently trickles down into the recyclables market, which stimulates it considerably. The market,

now, became a large disseminator of financial incentives for private parties, municipal collection crews, and the Tzu Chi Foundation.

For the latter’s decision makers, the financial incentive arguably became more important to the organization’s interests in 1998 with the establishment of Daai Television. Starting and maintaining a television station without commercial connections is an operation that requires heavy and lasting monetary means. While the TV station does not fully rely on recycling income, the funds gathered by recycling are all directed towards it, which may be assumed to be a substantial source of income. As a result of the stronger financial incentive, but also still holding on to its purposive incentives, the Tzu Chi Foundation further expanded all of its numbers; more volunteers, stations and recycling of all recyclables over this period.

As a result of the new 4-in-1 system’s financial incentives and convenience, all parties involved were interested in improving recycling and reducing waste production, and actively working to improve both. The result for the whole sector was the increase in recycling as described in chapter 4.1.2 figures d, e, f and g. At the same time however, the government still aimed to decrease landfilling and ‘other’ disposal methods by incineration, something that allegedly also resulted in recyclables being burnt.

Table 9 - Model for Tzu Chi’s actions over 1998-2006. Source: own.

Incentives	<ul style="list-style-type: none"> • Purposive: Ideological incentive to protect environment • Purposive: Ideological incentive to involve as many people as possible in environmental protection • Material: Financial incentive from recyclable purchasers. Markets strengthened due to subsidies.
Interests	<ul style="list-style-type: none"> • Further improving recycling efforts • Maintaining income to fund Daai TV
Actions	<ul style="list-style-type: none"> • Trend: Further building of volunteers; smaller increase in number of recycling stations.
Effect on recycling	<ul style="list-style-type: none"> • Relatively less impact as a national-level recycler, but still nominal increasing trend in recycling for paper, plastic and total numbers.

success	
Incentive interaction during period	<ul style="list-style-type: none"> • Incentives synergize towards expansion of recycling

6.1.3 2006 and after

In 2006, sorting recyclables from waste by households became mandatory nationwide, at the punishment of a fine, further pushing community members to sort recyclables from their regular MSW. This was, following the numbers, overall an effective implementation; government collection of recyclables increased and annual MSW per capita continued to fall. The new regulation- key in which was a considerable fine to those that wrongly disposed of their recyclables- pushed towards what was already well on its way to becoming the norm. .

During the same year, the Tzu Chi Foundation started developing textiles for emergency operations from PET-bottles; as described in chapter 5.3. This was with the aim of promoting recyclables as a raw material, and many textile companies over the following years followed suit in using recycled materials for textiles. Moreover, the Tzu Chi Foundation received a largely increased influx of PET-bottles for this year, as a result of both an increase of their own efforts and higher goodwill of community and municipal governments.

In the years after, many companies that had been working on similar technologies increased their technological capabilities and the scale of their operations. This would have increased the competition between collectors for recyclables, although direct evidence for this is lacking. What is known is that the Taiwanese recycled PET industry became one of the most advanced of its kind globally, with a further leading role for Da.ai Technology in domestic efforts to promote the technology and products. Whereas this provided incentives for other actors in the recycling sector, and one of the interests when doing this was to provide businesspeople with an opportunity to contribute to recycling, it did not *directly* contribute to recycling success as defined in this thesis.

Towards the community, Tzu Chi initially provided a convenient way of pursuing environmental ideals, after informing people, and they cleaned the local environment; this provided both a kind of material incentive and an ideological incentive. After increased national recycling however, both became less relevant for the community, and resistance grew both in media and the community.

An important factor here are the scavengers, which, as discussed in chapter 4.1.2 rely on recyclables for minimal subsistence, effectively providing a different kind of incentive, based on a social tie with the local people, for the community to recycle. Whereas the material incentive is not directly for the community, their consideration becomes steered by distribution of the material incentive more than before; when viewing it as such, it is best described as a crowding-out pattern of incentive interaction.

Certain is that increased efforts by all reduced the importance of the ideological incentive for the Tzu Chi Foundation volunteers to increase quantities; however, the solidary effect, where volunteers view recycling as a social activity, remained. Judging from interviews and the numbers, the whole organization was supportive of this new development, in which Tzu Chi nominally and relatively plays a smaller role as a collector and sorter. As pointed out by interviewees, there was less need to involve in the process of collecting- and sorting recyclables as the nation's recycling efforts, by community members, firms and municipal governments, increased by itself. Instead, the focus during these periods was on improving the existing recycling by better sorting, collecting new categories of recyclables (for example, sorts of plastics that were not commonly recycled before) and creating new purposes for the recyclables.

Table 10 - Model for Tzu Chi after 2006. Note: separated by- and related to actions. Source: own.

	Action 1	Action 2	Action 3
Incentives	<ul style="list-style-type: none"> • Purposive: Ideological incentive to protect environment • Material: Financial incentive from recyclable purchasers 	<ul style="list-style-type: none"> • Purposive: Ideological incentive to involve as many people as possible in environmental 	<ul style="list-style-type: none"> • Relatedness: social contact between (elderly) community members that help • Purposive:

		<p>protection</p> <ul style="list-style-type: none"> • Material: Financial incentive from Da.ai selling products made of recyclables 	<p>Ideological incentive to involve as many people as possible in environmental protection</p>
Interests	<ul style="list-style-type: none"> • Maintain income to fund Daai TV 	<ul style="list-style-type: none"> • Increasing the ‘quality of recycling’: how well recyclables can be re-used • Offer opportunity to businesspeople to contribute to recycling 	<ul style="list-style-type: none"> • Increase well-being of volunteers
Actions	<ul style="list-style-type: none"> • Keep collecting, but focus on quantity collected declined 	<ul style="list-style-type: none"> • Cooperating with industries to develop textile from PET • Establishing Da.ai Technology 	<ul style="list-style-type: none"> • Trend: Further building of number of volunteers
Effect on recycling success	<ul style="list-style-type: none"> • Relatively less impact as a collector: <ul style="list-style-type: none"> ○ Declining trend in paper (nominal) ○ Declining trend in total recycling (nominal) ○ Stabilized trend in plastics collected and sorted (nominal). 	<ul style="list-style-type: none"> • Da.ai: increased role in developing new recycling methods. No direct effect. 	<ul style="list-style-type: none"> • No effect found.
Incentive interaction during period	<ul style="list-style-type: none"> • As recycling became common practice, ideological incentive to increase involvement was considered less important. 		<ul style="list-style-type: none"> • Increased importance of relatedness incentive to recycle

6.1.4 In Pingdong City

In the city of Pingdong, the financial incentive provided by the market was too low for the contracted collector to continue. The city, too, could not fund it itself. This led to the involvement of the Tzu Chi Foundation, of whom the involvement was carefully considered internally; specifically, the judgment of Cheng Yen in this case was key. She pointed out, according to the TCQ, that the initiative both led to improved involvement of community members in recycling, as well as improved sorting, with volunteers leading the collection points to instruct community members on sorting.

Table 11 - Model for Tzu Chi in Pingdong City. Source: own.

Incentives	<ul style="list-style-type: none"> • Ideological: Protect environment • Ideological: Involve as many people as possible in environmental protection • Financial: Income from selling recyclables
Interests	<ul style="list-style-type: none"> • Maintaining income to fund Daai TV • Improving participation in recycling • Increasing the 'quality of recycling': how well recyclables can be re-used • Improving participation in recycling
Actions	<ul style="list-style-type: none"> • Cooperate with city government to collect recyclables and inform community members.
Effect on recycling success	<ul style="list-style-type: none"> • (Local) increase in collection and sorting of recyclables from regular waste.
Incentive interaction	<ul style="list-style-type: none"> • Master Cheng Yen was asked to confirm fit with organization's ideals

6.2 Incentive dynamics & further effects

In the above analyses, it became clear that for the Tzu Chi Foundation, first and foremost the ideological incentive is important in both making decisions as well as motivating

volunteers. For volunteers and members, the financial incentive received by the organization is one that they only benefit from in terms of continued existence of the recycling activities and promotion of its ideology, which means that it effectively only is a further non-material incentive for members and volunteers. At the same time however, volunteers have a relatedness incentive that is unique to them as a group in the organization, as recycling allows them to socialize with other members.

Over the whole picture of the above tables, the financial incentive strengthens the ideological incentives for the organization's pattern of decisions and actions, following a pattern that Frey and Jegen (2002) would describe as crowding-in. This became especially visible in their interests after 2006, when sorting, collection and even processing of recyclables became more common practice nationwide. As a result, the Tzu Chi Foundation focused less on actual quantity collected.

Subsequently, the Foundation started Da.ai Technology to develop new recycling technologies, improved its sorting, and focused on education. Instead of using its expanding volunteer base to compete for recyclables, their nominal throughput fell back to that of the period before 2006, and the growing trend that was present before stabilized for plastics and even became a declining trend for paper and the total of recycling. At the same time, it is clear that with the conception of Da.ai Technology they stretched themselves out up the value chain identified by Wilson et al. (2006) and thus most likely increased their income. Important to note here is that the framework above does not capture the full effect on recycling success. Da.ai's development of textiles and other materials made from recyclables provided another incentive to other actors, to improve their recycling. This falls outside the defined framework however.

With major decisions identified in this thesis, meaning the start of recycling operations, implementation of the cooperation between the Foundation and the city government in Pingdong and the initial efforts towards Da.ai Technology, spiritual leader Master Cheng Yen was consulted as the head of the organization. While financial gains towards other organizational goals seem to have played a role as well, the main motivator was the ideology.

The aforementioned decisions indicate that the two main sorts of incentives, ideological and financial, follow a hierarchical exclusion pattern for the organization, in which the ideological incentive requires to be satisfied first before any action is undertaken.

Following assertions by Wilson (1973) that the ideological incentive often is a very strong one, this sounds logical. Of course, since arguably the organization's main reason for existence is its ideology, this pattern should be hardly surprising.

Over time, this interaction of financial and ideological incentives to improve recycling and increase participation and awareness seem to have led to a consistent contribution at the forefront of recycling developments. It led them to be early in their pursuit of recycling when compared to the national government in 1990. Then, after 2006, national efforts by all actors improved significantly, as sorting for community became mandatory and recyclable collection by the government increased further. As a result, it became less important for the Tzu Chi Foundation to focus on quantity, since they were mainly motivated by ideological incentives to increase participation in recycling, something that now undeniably occurred without its interference. Instead, the Foundation initiated efforts to improve the use of recyclables by turning them into textiles, something that undeniably had an impact, but outside of the conceptual relations identified above.

In their endeavors, the Tzu Chi Foundation had advantages over the other parties in the recycling sector in terms of resources; both volunteers and donations are what the recycling branch mostly thrives on. They are particularly strong in inspiring using their charisma, as determined by Huang (2009), thus harnessing non-material incentives for these others to support them in recycling. In this, the ideology is also key: their aim to involve anyone, to 'practice Buddhism', is a key ideological aspect to spread and motivate grassroots movements and volunteers.

For volunteers, several important incentives to recycle can be distinguished. Firstly, there is of course the purposive, ideological incentive of saving the environment with as many people as possible. Secondly, there is a second incentive which relates to socializing and being part of the group that is formed at a recycling station; this can be regarded as a relatedness incentive. Thirdly, volunteering is something that is necessary to acquire the

role of commissioner; this is a status incentive. All these generally seem to synergize, although they are not the main topic of analysis following the framework.



7 Conclusions

This thesis has observed first the background of the Taiwanese recycling sector, and then collected and analyzed different sorts of data regarding the Tzu Chi Foundation's recycling. Later, this was combined and the model, outlined in chapter 3, was applied to the information collected, to come to an understanding of incentives and incentive dynamics, how these impacted the interests of the Tzu Chi Foundation and its different parts, and subsequently how this impacted its efforts towards recycling success

What remains in this chapter, is to distill from the analyses an answer to the main research question, and to sum up its consequences for practice and research, to recollect how the study has contributed, and to set out directions for further research. Finally, also limitations of the thesis will be discussed.

The framework used provides understanding of some, but not all, impacts. For example, the Tzu Chi Foundation's focus on education does not *directly* impact recycling success, and nor does the leading role of Da.ai Technology in the PET-textiles industry. Rather, it creates an incentive for other actors to contribute to recycling success. The model applied does not capture these effects- while they do indeed seem present. This would require inclusion of an arrow from 'actions' to other actors' 'incentives' box; a lesson that could be applied in other studies.

7.1 Findings

The analyses above indicate that an NGO can thus, indeed, quite well contribute to a recycling sector as a result of its combined incentives. The outcome of the analysis above seems to suggest that the NGO had a unique set of incentives, centering around the ideological incentive. The strong adhesion to the ideological incentive above others caused it to start recycling before other parties decide to do so. Later, it was related to the organization diminishing its role, as other actors took over; instead, the organization started focusing more on actual re-use of recyclables through Da.ai Technology. As a whole, this makes NGO participation especially interesting for nations where MSWM is less developed. Moreover, the outcome of this analysis confirms and explains assertions

by Mohamed et al. (2012a; 2012b) who find that religious non-for profit groups provide a considerable potential for recycling.

Particular to the NGO studied here are its ideology and the charismatic way in which this is communicated. The ideology outlines an aim to incorporate as many members of society as possible, in protecting the environment as well as possible. This, and the charismatic way in which it was spread, has made the organization successful in developing a recycling sector before the national sector was well-established, effectively bolstering grassroots movements.

Volunteers in these grassroots movements have been thus been moved by several incentives. Firstly, the ideology itself provides an incentive, and this plays a large role for most. For others, several more personal benefits such as fitness were even named during visits to the plant. Social connection, too, provides an important incentive for many of the elderly doing the daytime sorting who would otherwise risk exclusion from social environments. Finally, within the organization, there is a hierarchy with the Tzu Chi Commissioners above the volunteers, which creates a social status incentive. To become a Tzu Chi Commissioner, extra effort and dedication to the ideology is required. The sum of these are strong motivators following literature, which suggested that religious association and value expression are often strong motivators to recycle (Omoto and Snyder 1993; Wymer 1997; Bussell and Forbes 2001).

As recycling developed nationally, the NGO focused more on developing actual purposes for recyclables in order to make recycling and recycled products more attractive, as such providing an incentive to industry actors- and consequently indirectly to the recyclable market. This was both financially and ideologically attractive for the organization, but the fundamental factor in its decision making has always been the ideological incentive.

Whereas this is hardly surprising for an NGO, it has led it to the forefront in recycling, together with its 'hands-on' approach.

Assuming Geels' (2002) technological transition framework holds, the early role of the Tzu Chi Foundation seems to have played an exemplary role, first growing within the organization, to spread to other niches, and thus slowly impacting the landscape. The

scale of this impact is however uncertain, and would require further study following the outline of this framework of development of recycling in Taiwan by different actors.

An important factor for Tzu Chi's recycling motivation too, is the financial incentives provided by the recycling market. The market incentive program initiated under the 4-in-1 recycling program seems, from the numbers and trends, to have strongly increased alignment towards recycling, and it further backed Tzu Chi's motivation to recycle. More interesting even, is how the Tzu Chi Foundation has decreased its paper and total recycling after 2006, when adequacy of waste treatment seems to have risen nationwide. This suggests a less permanent role for an NGO, once other actors pick up.

It must be clear that not every NGO, nor every ideologically motivated NGO, nor even every religious NGO, can directly be expected to contribute to recycling in such a way. But with Mohamed (2012a; 2012b) and the analyses of this thesis there is an increasing expectation that ideological NGOs have strong potential as early adopters in recycling in rapidly developing countries, especially those that have religious populations.

The reports from volunteers however, which mentioned that many members are not Buddhist until after joining the organization as volunteers, indicate that the religious aspect of the NGO studied in this case may not be fundamental when attempting to replicate this model, however. Whereas volunteers and the Tzu Chi Quarterly did mention personal spiritual benefits, these were not often directly linked to the religion that the organization has founded its ideals on, suggesting that an NGO that is not religious, but simply strongly constructive and ideological, would be able to grow into such an important actor. It is at the same time true that religion is obviously a strong potential provider for these ideological incentives.

What is most remarkable, and arguably key in its contributions to recycling success, are the Tzu Chi Foundation's extremely hands-on approach. Its ideology is focused on laboriously pushing for what in their view- and most people would agree- is a better world, which motivates both outsiders and insiders through different mechanisms. This may result in difficulties when attempting to replicate the approach; it seems to be very much related to culture, too, other than just organizational- and technological capabilities.

Obviously, ideological incentives have some practical downsides as well. It would be hard to affect or steer an organization that relies on ideological incentives externally. Wilson (1973) asserts, “*(Ideological incentives) attract persons prepared to make deep and lasting commitments to the cause*”, but also that “*ideological (...) organizations display little flexibility about their objectives or, if the objectives are changed, the transformation exacts a heavy price in associational conflict and personal tensions.*”

7.2 Contributions

7.2.1 Academic contributions

This thesis observes and provides an argument for how an ideologically motivated NGO, in this case a religiously motivated NGO, can indeed support the recycling sector, and run ahead of its peers in organizing and coordinating efforts towards collection and even further recycling. This is done by looking at both its incentives for volunteers, as well as the incentives the organization has for its actions, and subsequently looking at how these actions contribute to overall recycling success. The latter bases on the study by Tang and Tang (2014) and is explained in a new visual framework that was not yet found in other literature; suggestions for improvement are also made in this chapter. This framework may as such be used to inform further studies that base on incentive dynamics.

As for the typology of incentive dynamics introduced by Tang and Tang, (2014) this thesis observed three. Firstly, synergetic effects, mostly during Tzu Chi’s early years. Secondly, hierarchical exclusion effects, as the Foundation tested several decisions by their fit with the organization’s ideology. Thirdly, in its impact on the community, the Tzu Chi Foundation ran into crowding out of ideological incentives, as the minimal subsistence that collecting recyclables provided for scavengers became an important argument for critics of the organization.

Whereas, when observing incentives for individuals, this type of dynamic may generally focus on more material factors, the ideology for the organization studied here as an actor is its basic reason for existence, and thus it is reasonably its basis for decision making. As

such, it adds extra body of evidence to this typology, observing incentive interaction patterns in a different setting, with different sorts of actors, and over a longer time period.

Furthermore, this study provides backing to calls by Baud et al. (2001) and Wilson et al. (2006) to further integrate informal, non-government led MSWM practices, something that is common already in Taiwan and is extensively studied in this thesis. Secondly, it supports the idea of Mohamed (2012a; 2012b) that religiously motivated, or, more broadly, ideologically informed NGOs are potentially strong and leading contributors in an MSWM-sector. It shows how an ideological incentive can play a role in creating a high-profile early adopter, which following the Technology Transfer Model would be crucial in re-shaping the landscape.

Finally, there is no extensive English-language publication yet on the recycling activities of the Tzu Chi Foundation in Taiwan. As such, the description in this thesis may inform further studies of MSWM or the Tzu Chi Foundation by doing so. It may form input for- or more indirectly inspire studies of the Foundation's recycling activities.

7.2.2 Practical contributions

For practitioners, too, this thesis may provide valuable input. For the Tzu Chi Foundation itself, it may further provide insights in its internal incentives. Within Taiwan, it adds to a more comprehensive understanding of the recycling environment and lead to further integration of parties into the system. Outside of Taiwan, mostly in countries where MSWM is in early development stages, it may lead to increased interest from NGOs to engage in recycling, as well as from governments to stimulate or welcome recycling. For the former, this study also provides (limited) insight in how ideology can shape effectiveness.

The fact that the ideology plays such a key role in this instance may also form a warning of sorts to policymakers and NGOs outside of Taiwan, in that Taiwanese recycling success may be difficult to replicate. As mentioned before, ideology is- especially from outside an organization- something that is difficult to change or abolish. Practitioners that thus wish to copy the success may want to consider this, and broaden their view from

only the recycling technologies that are implemented to include the social and ideological context of these technologies.

7.3 Future research

Observing the current role of the Tzu Chi Foundation as an NGO has here been done from an incentive perspective, evaluated on its contribution to recycling success. Future studies may want to focus on its economic impacts. Problematic here is however that the informal sector, which in Taiwan is of considerable size, is difficult to map and study accurately; studies have attempted this before, but a credible estimation still needs to be published.

Further studies may also attempt to find similar cases and subject them to the same tests as done here, to come to insights as to how especially non-material incentives can be harnessed by groups to further recycling, or steer towards other purposes. This would greatly improve the practical application of incentive theory. Comparative material could provide further insights as to which factors are crucial in building a well-aligned NGO or even recycling sector as a whole.

Further work needs to be done to develop the practical application of incentive theory as a policy tool, further investigating incentive dynamics in policy and institutional environments. This thesis has provided a visual framework; however, future studies can focus on incorporating the reciprocation of actions on other actors' incentives, to further develop this framework. Whereas observed here throughout the study, it was not incorporated into the framework; this could for example be done if the framework is viewed as a 'repeated game', applying it to successive periods for a set of actors over to arrive at insights as to how these actions affect others' incentives and incentive dynamics.

7.4 Limitations

This thesis has developed an understanding of NGO impact in an MSWM sector. It must be noted that there are some limitations to this research, too. Firstly, the nature of the research was to look into how incentive caused the organizations to contribute. This

translate to an analysis of positive effects; while no strong evidence for negative effects was found, this was not the main focus of the study. For a more complete picture, a future study may focus on the complete set of advantages and disadvantages of the Tzu Chi Foundation's activities- or an NGO's activity in general.

A second limitation lies with the nature of the organization that was analyzed for this thesis, and relates to the first one. While it was attempted to control for bias by analyzing newspapers and external reports where available, glorification such as pointed out by Huang (2009) may have influenced the analyses toward a more positive direction. It was attempted to control for overly positive bias by checking facts and numbers from other sources, but the storyline may have been influenced by the organization's storytelling.

A third limitation is the goals on which the NGO's role was evaluated. These goals are traditionally closer to the NGO's ideals than what governments commonly pursued or could pursue during the 1990s. Nevertheless, they are accepted as the standard by at least Taiwanese governments today, as outlined in the Resource Recycling Act, and commonly accepted in both academia and practice as two important indicators of recycling success. Nevertheless, a future study may want to focus more on the economic impacts of an NGO in recycling; currently however, too little is formally known about the scale of informal sector, with estimations running far apart, as indicated in chapter 4.1.

A fourth limitation lies in the scale of analysis that was taken in this thesis. The main topic of study was a large organization, making it impossible to identify at times where individual incentives were. Instead, an approach was chosen where the Tzu Chi Foundation was considered as an actor. Important to mention is that this requires some

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Appendix

Appendix 1: Methods data table.

Table 12 Methods data table. Source: own.

Types of data		Data
<i>Qualitative</i>	Recycling incentives for Tzu Chi volunteers	Interviews, Tzu Chi Quarterly
	Recycling incentives for the Tzu Chi organization as a whole	Interviews, Tzu Chi Quarterly
	Recycling incentives for the Da.ai Technology Corporation	Interviews
	Channels of recycling input for the Tzu Chi Foundation	Interviews, Tzu Chi Quarterly
	Tzu Chi's recycling activities and streams of plastic and paper	Interviews, Tzu Chi Quarterly, Tzu Chi Nianjian (Yearbook) 2006-2011
	Possible other outcomes of incentives	Interviews
<i>Quantitative (descriptive)</i>	Recycling collection: <ul style="list-style-type: none"> • Plastics • Paper • Total 	EPA Statistics
	Recycling collection: <ul style="list-style-type: none"> • Plastics • Paper • Total 	Tzu Chi Nianjian (yearbook)

Appendix 2: Interview protocol

Note: this protocol was followed, but questions deviated from order and phrasing as the conversation progressed. Question list was used to check whether information required was provided.

1. This research focuses on Taiwanese recycling of plastics & paper, and specifically the Tzu Chi Foundation's / DaAi Technology Corporation's role in this. Main factors the why of the organizations and its people to recycle, and what exactly did they do. My goal is to see how this grew since the Tzu Chi Foundation began recycling until now, and see how it affects Taiwanese recycling success.
2. If you could refer me to other possible interviewees that would be greatly appreciated too. These will be interviewed for both confirmation and adding to the data. One interview will not be accepted by my thesis committee as a base of data.
3. After the interview, I will provide a preliminary transcript within a few days, so that you may check the answers provided and I can make changes if necessary.
4. If possible, I would greatly appreciate documents, statistics and possible other resources that will help understand the answers to these questions, provide evidence, or any other information you think may be relevant. These may be either English or Chinese; I have limited translation help available.
5. Please consider the questions below. If something is unclear, feel free to ask beforehand or during the interview.
6. On the interview day, I may ask additional questions to clarify responses. The question order may differ, depending on the answers.

Interview:

Ask questions, small talk: Weather, recent recycling events.

Also: how long has the interviewee been with the organization? What is their position?

Interview is about Tzu Chi, explain goal.

Ask for agreement on recording.

Questions:

1. *When, how and why did Tzu Chi start recycling, and how did this develop over time?*

	a. When and why did they start?
	b. Please tell me about the initial goals of the Tzu Chi Foundation when they started recycling. How did these evolve later?
	c. How did they start?
	d. Could you provide information about the scale over time? E.g.

	recycling plants, number of volunteers, volumes (paper and plastics) recycled?
	e. How did and does the Tzu Chi Foundation motivate its volunteers to recycle?
	f. Did this change over time?
	g. How does the Tzu Chi Foundation collect its plastics and paper, and what did they do with them?
	h. Did the Tzu Chi Foundation coordinate its activities with the government?
	i. Did the Tzu Chi Foundation cooperate with private parties throughout its history?

2. *How did Tzu Chi's and DaAi's recycling develop further?*

	a. Why did the Tzu Chi Foundation set up DaAi Technology Corporation?
	b. Did the goals of the Tzu Chi Foundation and DaAi Technology Corporation change over time? E.g. better sorted, etc? Why?
	c. Funds from recycling are said to be donated to DaAi TV. What was done with these funds before that?
	d. How is (new) knowledge about sorting, etc, spread to other recycling points?
	e. In 2006, the recycling (especially of PET bottles) went up spectacularly. What do you think is the reason for that?
	f. What are the changes that you see overtime in the process?
	g. Has it gotten more difficult to collect recyclables for Tzu Chi?

3. *What is the current state of affairs?*

	a. What are the Tzu Chi Foundation's and DaAi Corporation's current reasons to recycle?
	b. What are their current goals? How were these influenced by previous events? What are the goals within recycling?
	c. What are their current activities?

4. *Exit questions*

	a. What do you feel is the most relevant thing to this study that you've mentioned?
	b. What is furthermore remarkable about the recycling process? Do you have any information that you feel would add to this research?

After:

- Ask for possible documents, statistics.
- Moreover, ask if e-mail is possible for clarification
- Ask for possible other interviewees
- Thank sincerely for interview.

Appendix 3: Interview & TCQ quotes (continued on next five pages)

Table 13 - Quotes from interviews and TCQ. Source: various.

No.	Label	Source	Author	Translator	Quote
1	"Start recycling with clapping hands"	Interview I			<i>So, when she was on her way there, and the background back then, in 1990, in Taiwan, was when the economy was soaring, but that gave a lot of problems with garbage. Maybe, maybe like London in the 80 somethings, you know. Ehm, so that was the problem and eh, in her public speech, after the public speech, everybody was clapping of course, and then she said that famous sentence: "you can all use your clapping hands right now to do recycling".</i>
		Interview II			<i>Yes. Eh, like, 1990. Master Cheng Yen, she attended a school? eh, a school? conference, to get (?) on her way to the school, she passed a market place, a traditional market, and she saw lots of garbage on the ground. You know, eh, in the local traditional market place they dropped all the, the leaves or whatever on the ground. Eh, when she ended the speech, she asked all the audience: "please, give, please, do recycling, instead of applauding (with your) hands.". Since then we began recycling.</i>
2	Spend time recycling	TCQ Summer 1999	He Chen-ching	Norman Yuan	<i>Each trainee also participates in small-group practical training through various types of volunteer work, such as in the hospital or in resource recycling, and she submits reports describing what she has gained from the experience. These reports are reviewed and evaluated by a local group of commissioners responsible for training.</i>
3	100 recycling points in Tainan	TCQ Summer 1996	Shen-yen Chang	Ping Chen	<i>During the winter season in Tainan, (...) spread out to over 100 recycling points.</i>
4	Following	TCQ Summer 2014a	Ye Zi-	Tang Yau-	<i>They process the bags so that each one is completely free of</i>

	market		hao	yang	<i>undesirable foreign matter, such as adhesive, price labels, and ink. They take the time and energy to do this to get the best recycling price for the bags.</i>
			Ye Zi-hao	Tang Yau-yang	<i>The group that finishes the processing is mostly made up of elderly volunteers. They remove foreign items from the bags, such as price stickers and sealing adhesives. This is a significant step in elevating the plastic bags to the highest grade possible, so that the dealers who purchase the bags can more easily recycle them, for which they are willing to pay higher prices—as much as over ten Taiwanese dollars a kilogram (15 American cents per pound)</i>
		TCQ Fall 2013	Wu Yudi and Huang Xiao-qi	Tang Yau-yang	<i>Old newspapers, when folded and stacked into neat piles, fetch a higher price.</i>
		TCQ Fall 2003	Ye Zi-hao	Tang Yau-yang	<i>With a little effort, the recyclable items can be sold at higher prices so that the money earned can be donated to Tzu Chi. He and other volunteers classify items including paper into categories such as white paper, semi-white paper, printer paper, newspapers, thick cardboard, etc. By doing so, the recycled paper can then be sold at twice the original price.</i>
		TCQ Summer 1996b	Yueh-hung Tai	Li-ling Yang	<i>To obtain higher prices for the collected resources, especially paper, volunteers neatly bundle them.</i>
		TCQ Summer 1996c	Shen-yen Chang	Ping Chen	<i>Many volunteers tear heavy cardboard boxes apart and then refold them neatly. "If everything is nice and neat, you can get a higher price," Grandma said. She added, "Amitabha, we give the waste paper to Master Cheng Yen and turn it into bricks to build a hospital."</i>
		Interview II			<i>Ralph: So not much. The changes that you did see, where did you see them? Is there stricter sorting, is the process different, is the collection different? - E.: It all depends on price. Let's take the situation, because the oil price dropped significantly, so recyclers</i>

					<i>don't want some plastics.</i>
5	Street-sweeping	TCQ Fall 1997b	Jo Chen		<i>In the afternoon, the elders and the women put on working clothes and straw hats and assembled in front of the church. When Pastor Chin shouted "Go," they started to sweep streets and clean gutters. Little kids took trash bags as tall as they were and collected small pieces of garbage.</i>
		TCQ Summer 1996b	Shen-yen Chang	Ping Chen	<i>Twenty or thirty volunteers, wearing bandannas and bamboo hats, squat on the ground near a paper factory, picking up pieces of waste paper for recycling and "counting their blessings" bit by bit.</i>
		TCQ Summer 1996b	Shen-yen Chang	Ping Chen	<i>Most raw recyclables are collected from ditches, streets, market stalls, or small shops.</i>
6	Recycling revenue in Tainan	TCQ Summer 1996	Shen-yen Chang	Ping Chen	<i>The resources recycled in the Tainan area in 1995 totaled 3,795 tons. This included 3,005 tons of paper, 706 tons of steel cans, 42 tons of aluminum cans, and 42 tons of plastic bags, as well as 57,233 plastic bottles. The revenues from the recycled resources totaled NT\$11.9 million (US\$440,000).</i>
7	Da.ai entrepreneurial inspiration	Interview I			<i>Eh, well, eh, in Tzu Chi, there are volunteers coming from different statuses. Including entrepreneurs, so bosses, managers and all that. So, eh, (?) eh, a very good example is, was in Indonesia. In 2002, 3, I, I don't remember which year that was, but the anka river, the black heart of Jakarta was flooded, and the local residents living on the sides depended on this river, to eat, to drink, to poop in it, to throw garbage in it because they lived next to it, and no one told them not to, before. So, the lfood happened, and Tzu Chi Indonesian volunteers, they worked with the military, they cleaned up the river. It's so clean now, so they can do Dragon Boat, Dragon Boat racing, on dragon boat festival. They can do that in the river. And of course they built schools, they built homes, for these residents, relocating to better conditions,</i>

					<i>and for the kids to receive education. The Indonesian volunteers were mostly entrepreneurs, local entrepreneurs, and they show a power that what entrepreneurs can also do, even though they're wealthy they can also go into volunteering work, really do a big influence and change the course of life. So the Taiwanese entrepreneurs saw that and they realized they should do something here as well.</i>
		Interview V			<i>...our master said, PET bottle and clothes are made from oil. So can you develop a technology to turn PET bottles into textile? So this brother, they combined very important industries in Taiwan, to work together, to develop this technology</i>
8	Da.ai donating profits to NGO client	Interview I			<i>For example last year, we worked with a charity group and they hired, eh, lower development, I don't know how to say it, they're not disabled, but they're just slower in development. So, they hire these people to package coffee that they buy and then they sell that and it becomes their salaries and all. So they hire, they provide job opportunities for these people. So we worked together with them, and promoted a package and we had a great success, we took nothing in return, we donated everything back to this foundation...</i>
9	Da.ai moral business	Interview I			<i>And, they know that 100% goes back to charity, that's why they're willing to work with us, it's just, a lot of entrepreneurs they have a heart to contribute, they just didn't find a way, all they knew was to donate money and that's it. But, eh, this platform (?) they see an even better contribution that they can make with their expertise.</i>
10	Da.ai pioneers PET recycling	Interview V			<i>So, when we started this, people noticed: oh, PET bottles can become textile, or blankets, to help other people. But there are a lot of companies that also started to do the same thing.</i>
					<i>In that point, the technology is just developed, and Tzu Chi people tell a lot of people how we can do this. So there are a lot of</i>

					<i>industries that started to do this.</i>
		Interview I			<i>These (?) the group, they successfully developed blankets, ecoblankets from recycled bottles, so they started distributing that in 2006. In 2008, the entrepreneurs, they realized that apart from blankets, you can turn PET bottles into anything. So why not do that, and with the power of green brands and green products, we become? we act as a reminder for people that in our daily live, for example if I didn't tell you you wouldn't know this carpet is from recycled bottles, or these pillow cases, or the light cover, a lot more within this area.</i>
11	Tzu Chi manual sorting PET	Interview V			<i>But the key point is, there are a lot of volunteers, that separate the... the caps from the bottles. In the beginning that was a very key point, but now it is not.</i>
12	Da.ai Immaterial incentive	Interview I			<i>What I'm trying to say is that, working for Daai you get these experiences you don't get in other places that eh, sometimes, you experience personally. Those moments are the most touching moments that eh, stay in your mind, stay in your heart.</i>
13	Growth peak 2006	Interview V			<i>Yea. But when we opened, when we started to tell this story, a lot of people were amazed. But some companies discovered, a lot of people are probably interested in this product. So, I can use this to create a business. So, when we started this, people noticed: oh, PET bottles can become textile, or blankets, to help other people. But there are a lot of companies that also started to do the same thing.</i>
					<i>B: (...) at the time, Tzu Chi People are starting to tell a lot of stories about recycling. So the government, they noticed this issue, so they started to encourage a lot of schools. They got to eh, all the teachers got to teach children how to do recycling. And the</i>

					<i>children start doing recycling in their campus. So they sell it as their foundation. So we... although we... the amount decreased, but the total recycling in Taiwan increased.</i>
14	Positive about competition	Interview IV			<i>Ralph: So is Tzu Chi happy to see that they have a lower percentage of recycling? M.: eh... maybe, we know it's a good thing.</i>
		Interview V			<i>Ralph: Right, in Taiwan it's going up. So do you think for the Tuz Chi Foundation it has gotten more difficult to collect recyclables B: No, no, we don't say that. Because our aim, our purpose is to act, to hope that all the people will recycle.</i>
15	Complaints from neighborhood	Interview III			<i>Ralph: I had one more question... ah, did you notice that collecting recyclables has gotten more difficult? E: [Translates] U: [Speaks in Chinese] E: She says that we did have some problems with people from around the neighborhoods. They complain, the smell, the noise from the collecting recycling. They will file formal complaints to the government.</i>
		Interview II			<i>E.: Yes, yes. Just like a snowball. But you know, the recycling it smells very awful in the summertime. So, eh, some neighborhoods, they do not, or they cannot understand why we do that. So they will talk to the government. And some collection points will be cancelled.</i>
16	Tour groups visiting recycling stations	TCQ Fall 2012	Pu Yi-cheng		<i>The Annan Recycling Station regularly receives visitors of different ages, such as this group of small children. Volunteers usually give visitors an introduction and a tour of the facility, and then they let them roll up their sleeves and get their hands a little dirty in a hands-on session.</i>
		TCQ Summer 2012	Chen Shi-hui	Tang Yau-yang	<i>"I'd never conducted a tour before, but I'd seen others do it. Besides, how difficult could it be to handle some little kids for ten minutes?"</i>

		TCQ Spring 2012	Chen Shi-hui	Tang Yau-yang	<i>The station is located on a busy street in Taipei. That makes it an ideal venue for promoting the ecological causes of Tzu Chi. It is a multi-functional center for many facets of recycling: sorting and handling raw recyclables, conducting tours for visitors, and hosting a thrift store.</i>
		Interview II			<i>Because, I, I, I used to be a tour guide here. For (?) student from South East Asia countries. That's because they want to learn how to do it.</i>
17	Procedural education to resource reduction	Interview V			<i>So, we started to educate people to satisfy them with what they have, not to encourage to do recycling. If they're satisfied with what they have, they don't need to buy a lot of things</i>
18	Recycling as socializing activity	Interview V			<i>A lot of older people, when they stay at home, their spirits will decrease, day by day. But here they can actually do recycling, and they have social interaction, and their health increases. So we encourage people to come and become a Tzu Chi volunteer, to take care, those old men.</i>
19	Cooperation with scavengers	TCQ Winter 2012	Ye Zi-hao	Tang Yau-yang	<i>Tzu Chi volunteers work at 85 percent of the collection points, and private individuals handle the rest. This is done so as not to deprive individual scavengers of their livelihoods.</i>
20	Old collection deal Pingdong	TCQ Winter 2014	Ye Zi-hao	Tang Yau-yang	<i>Before the new program came into effect, city recycling trucks used to tag along behind garbage trucks as they made their rounds through the neighborhoods. Back then, the city contracted out the recycling part of the pickup service. The pickup trucks were provided by the city; the contractor was responsible for the operating costs, such as truck drivers, other workers, and gasoline. Part of the proceeds from the sale of collected recyclables went to the city, and the contractor kept the remainder.</i>
21	Tax investments for alternatives	TCQ Winter 2014	Ye Zi-hao	Tang Yau-yang	<i>But that would not have been a happy solution. To handle recyclables in-house, the city would have had to increase their</i>

					<p><i>budget US\$330,000 per year for personnel, fuel, and vehicle maintenance. The total revenue from the sale of recyclables in 2013 was only US\$60,000. It would have cost Pingdong citizens US\$270,000 a year if the city itself had taken over the job of handling the recyclables. Submitting a budget request for such a large sum was not very appealing to government officials. They were eager to find a better solution.</i></p>
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Appendix 4: Recycling statistics table (Continued on next two pages)

Table 14 - Taiwanese recycling & Tzu Chi: statistics. *: statistics unavailable. **: calculations not possible due to lacking data. Source: own. Statistics obtained from Taiwan EPA and Tzu Chi Foundation Annual Reports 1995-2015

	1995	1996	1997	1998	1999	2000	2001	2002
Tzu Chi Foundation								
<i>PET (kg)</i>	*	*	*	*	*	*	*	4,772,137
<i>Other plastics (kg)</i>	*	*	*	1,609,922	146,440	2,549,857	3,590,934	4,530,579
<i>Plastic bags (kg)</i>	*	*	*	*	*	*	*	*
<i>Paper (kg)</i>	18,337,852	23,483,029	33,816,035	44,855,031	52,011,931	55,727,093	62,442,416	68,591,194
<i>Total recycled (kg)</i>	20,733,888	27,274,949	40,545,430	54,324,288	66,630,503	71,699,396	*	94,014,382
<i>Growth (%)</i>	**	32%	49%	34%	23%	8%	*	*
Taiwan govt. agency recycling								
<i>Plastics & rubbers (kg)</i>	*	*	*	*	*	*	80,922,045	94,584,076
<i>Paper (kg)</i>	*	*	*	*	*	*	293,790,169	452,106,166
<i>Total (kg)</i>	*	*	*	*	*	*	584,332,617	878,319,318
Tzu Chi's relative recycling								
<i>Plastics</i>	*	*	*	*	*	*	**	9.84%
<i>Paper</i>	*	*	*	*	*	*	21.25%	15.17%
<i>Total</i>	*	*	*	*	*	*	**	10.70%
No. of volunteers								
<i>No. of volunteers</i>	*	*	*	*	*	*	*	31,613

Table 10 (cont., 2/3) - Taiwanese recycling & Tzu Chi: statistics. *: statistics unavailable. **: calculations not possible due to lacking data. Source: own. Statistics obtained from Taiwan EPA and Tzu Chi Foundation Annual Reports 1995-2015

	2003	2004	2005	2006	2007	2008	2009	2010
Tzu Chi Foundation								
<i>PET (kg)</i>	11,127,212	13,640,774	15,300,645	28,961,873	7,491,504	5,369,171	12,156,798	9,231,468
<i>Other plastics (kg)</i>	*	*	*	8,281,635	8,662,647	8,230,597	8,658,388	8,802,310
<i>Plastic bags (kg)</i>	*	*	*	*	*	*	*	*
<i>Paper (kg)</i>	77,576,656	78,593,616	77,515,869	84,080,873	95,714,325	71,069,153	72,920,943	69,194,122
<i>Total recycled (kg)</i>	111,433,650	115,260,562	116,345,949	152,362,067	148,332,517	117,902,949	125,561,560	119,654,024
<i>Total growth (%)</i>	19%	3%	1%	31%	-3%	-21%	6%	-5%
Government recycling								
<i>Plastics & rubbers (kg)</i>	111,384,889	140,874,674	178,555,067	202,364,524	218,714,038	243,637,211	286,954,328	305,409,839
<i>Paper (kg)</i>	543,995,206	715,071,816	892,618,350	1,090,346,051	1,236,822,335	1,328,826,583	1,458,762,036	1,574,592,846
<i>Total (kg)</i>	1,048,980,597	1,392,714,977	1,756,034,606	2,107,036,593	2,408,428,782	2,497,984,753	2,718,802,888	2,948,681,044
Tzu Chi's relative recycling (% of government recycling)								
<i>Plastics</i>	9.99%	9.68%	8.57%	18.40%	7.39%	5.58%	7.25%	5.90%
<i>Paper</i>	14.26%	10.99%	8.68%	7.71%	7.74%	5.35%	5.00%	4.39%
<i>Total</i>	10.62%	8.28%	6.63%	7.23%	6.16%	4.72%	4.62%	4.06%
No. of volunteers								
	37,135	44,050	50,208	57,097	62,126	63,254	67,246	72,164

Table 10 (cont., 3/3) - Taiwanese recycling & Tzu Chi: statistics. *: statistics unavailable. **: calculations not possible due to lacking data. Source: own. Statistics obtained from Taiwan EPA and Tzu Chi Foundation Annual Reports 1995-2015

	2011	2012	2013	2014	2015
Tzu Chi Foundation					
<i>PET (kg)</i>	5,590,089	4,517,539	4,978,033	4,372,914	3,552,234
<i>Other plastics (kg)</i>	8,947,329	9,906,201	8,563,228	8,779,663	8,034,734
<i>Plastic bags (kg)</i>	*	*	3,137,664	4,015,332	4,324,396
<i>Paper (kg)</i>	56,629,070	57,106,919	56,042,350	57,557,539	50,608,230
<i>Total recycled (kg)</i>	103,787,810	102,581,484	106,956,915	109,500,560	100,051,876
<i>Total growth (%)</i>	-13%	-1%	4%	2%	-9%
Government recycling					
<i>Plastics & rubbers (kg)</i>	301,316,589	320,763,043	333,855,810	319,820,702	311,959,873
<i>Paper (kg)</i>	1,611,330,716	1,717,286,948	1,727,044,396	1,768,517,295	1,802,590,672
<i>Total (kg)</i>	2,982,855,395	3,167,655,733	3,273,187,769	3,341,657,157	3,373,190,314
Tzu Chi's share of recycling					
<i>Plastics</i>	4.82%	4.50%	5.00%	5.37%	5.10%
<i>Paper</i>	3.51%	3.33%	3.24%	3.25%	2.81%
<i>Total</i>	3.48%	3.24%	3.27%	3.28%	2.97%
	*	*	*	*	*
No. of volunteers	76,742	80,275	82,904	84,878	86,594