

# Role of religious communities in enhancing transition experiments: a localised strategy for sustainable solid waste management in Malaysia

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Received: 15 June 2011 / Accepted: 25 April 2012 / Published online: 27 May 2012  
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**Abstract** Religion in its most ideal form is seen as a powerful force to create ecological transformations to succeeding generations that share similar religious beliefs. This provides an interesting argument for enhancing their role in sustainability transitions. Malaysia is a relevant geographical context in this regard since almost all of its citizens formally embrace some kind of religious belief. However, such ideas are discussed mostly at the theoretical level with little systematic empirical investigation. This paper aims to fill this gap by presenting theoretically informed empirical insights on how a number of religious communities are currently creating successful experiments in recycling within the context of an urban community in Malaysia. The paper argues that such evidence may demonstrate the ‘potential’ role of religious communities to provide localised resources for recycling experiments that can be advantageous for the transition towards a more sustainable municipal solid waste management in

Malaysia. The empirical basis of this paper is based on an exploratory multiple case study of successful recycling programmes conducted by selected religious communities from four key religions in Malaysia—Buddhism, Christianity, Hinduism and Islam. The theoretical framework for this research is based on the sustainability transitions literature, particularly the ‘transition experiment’ framework.

**Keywords** Sustainability transition · Transition experiment · Solid waste management · Religious community · Policy

## Introduction

Sustainable development has become an overarching objective for societies world-wide. However, systematic studies on sustainability transitions (van den Bergh et al. 2011) are conducted primarily in the context of the West, even though transformative changes towards more sustainable development pathways are pressingly needed in the rapidly urbanising and industrialising Asian economies and societies (Berkhout et al. 2010; Bai et al. 2009). In line with this concern, there is a growing acknowledgement in the literature that ‘religion’—as one of the predominant features in many parts of Asia (Mulder 2001)—can play an effective role in the protection of the world’s ecological systems (Foltz et al. 2003; Tucker and Williams 1997; Chappel and Tucker 2000; Hessel and Ruether 2000). Religious belief in its most ideal form is seen as a powerful force to create purposive transformations by transmitting ecologically positive habit of practice and attitudes of mind to succeeding generations that share similar religious beliefs (Foltz et al. 2003), and therefore has the potential to act as a platform for wide-scale transition towards a

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Handled by Peter Marcotullio, Hunter College, USA, and Osamu Saito, UNU—Institute for Sustainability and Peace (ISP), Japan.

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greener future<sup>1</sup> (Taylor 2004). This potential is accentuated further by the possibility that religion will continue to be a significant (Johnson and Barrett 2004), albeit at times controversial (de Vries 2003; Jean-Philippe 2008), social shaper of future societies.

South-East Asia, and specifically Malaysia, is a particularly interesting policy context for this kind of argument since almost all of its citizens formally embrace some kind of religious belief. According to 2007 statistics,<sup>2</sup> approximately 61 % of the population in Malaysia practice Islam; 19 % Buddhism; 9 % Christianity and 6 % Hinduism. The remainder is accounted for by other faiths, including Animism, Sikhism, and the Baha'i Faith. Those with no religion cover less than 1 % of the Malaysian population. Hence, the role of religious communities in enabling or hindering sustainability transition might be an interesting area to explore within this context.

Indeed, optimism regarding the power of religion to create large-scale and deep-seated ecological transformation, plus the strong religious socio-demographics of the country has already encouraged popular views on the important role of religious communities in enhancing environmental practices in Malaysia (Zuhdi 2012; Mohd Hazim et al. 2012; Sharifah Zaleha and Hezri 2009; Adi 2007). However, within the academic literature, these are discussed mostly at the theoretical and conceptual level with little systematic empirical observation on the ground. Even if empirical evidence is being reported, most of the literature is quite general or anecdotal, and based on historical cases (particularly on past traditions) rather than contemporary ones. This limits the practicality of such arguments, particularly when applied within policy concerns of contemporary modern society. Nonetheless, from general observation, such optimism is not without grounds—especially in the environmental issue of municipal solid waste management (MSWM), one can increasingly observe the proactive role of Muslim (NST 2010a), Hindu (Komunitikini 2011), Buddhist (The Star 2008) and Christian (NST 2010b) communities in organising successful recycling programmes in the country, and influencing good recycling practices, particularly in urban areas.

In order to reduce this empirical gap, we have conducted an exploratory empirical investigation on the role of religious communities in the adoption of recycling practices within the State of Selangor, Malaysia. The key empirical findings of the research have been reported in recent

publications in the journal '*Waste Management*' (Zeeda et al. 2011a) and '*Resources, Conservation and Recycling*' (Zeeda et al. 2011b). As a follow-up to the empirical work, this paper attempts to translate the empirical findings into theoretical insights, i.e. by using the sustainability transitions literature, particularly the framework of "transition experiments" as its conceptual and theoretical basis. The main objective of this paper was to investigate how far the empirical findings fits into this framework—and from this exercise, to provide more concrete empirical–theoretical insights into the potential role of religious communities in strengthening transition experiments for more sustainable MSWM in Malaysia.

### Transition experiment as a theoretical framework

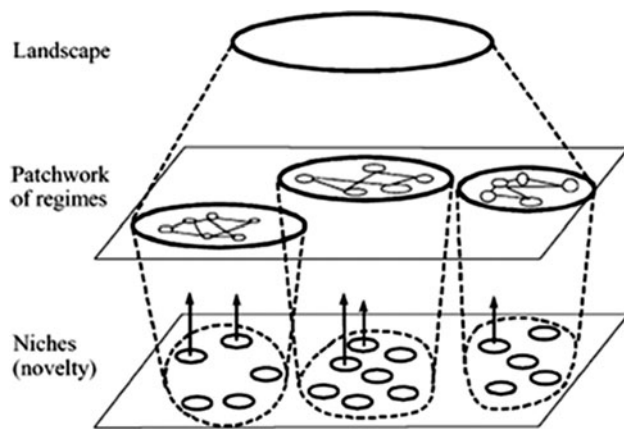
In recent years, the literature on innovation systems has argued increasingly that changes in socio-technical regimes are fundamental to creating structural changes in the economy, and therefore a fundamental process in achieving sustainability. Such views are deeply rooted in the evolutionary perspective that the interplay between economic growth and technological change are closely related, and that they co-evolve. Socio-technical change is seen as complex, unstructured, multi-causal, involving many stakeholders, shrouded by uncertainties and deeply rooted in our societal structure and institutions (Kemp and Soete 1992). From this viewpoint, the move towards sustainable development demands a more holistic revision of the socio-technical environment. Piecemeal solutions in greening individual behaviour (deep ecology), artefacts (green technology), industrial processes (cleaner production, ecological modernisation) and markets (neo-liberal market mechanism) may not be sufficient to achieve the level of transformation required for sustainability (Mulder 2007; Geels et al. 2008).

This intellectual movement has led to the growing literature on sustainability transitions, where the changes necessary for sustainability are viewed at the level of structural transformation of broad societal functions such as energy supply, mobility, health-care, agriculture and waste management (van den Bergh et al. 2011; Loorbach and Rotmans 2006; Elzen et al. 2004)—with 'technological change' being seen as one key component of the broader institutional, behavioural and cultural changes that co-evolve. One of the key heuristic tools used to explain the process of sustainability transitions is the multi-level socio-technical system framework (Rip and Kemp 1998; Geels 2002, 2004). The framework explains sustainability transitions by the interplay of processes at three different levels: niches, regimes and landscapes (Fig. 1).

Regime' represents the dominant selection environment for technological development in a particular societal

<sup>1</sup> However, the literature also contains various arguments on the role of religion in precipitating environmental damage. See Taylor (2004) for a literature review on the two opposing perspectives, and how this can shape the role of religion in a greener future.

<sup>2</sup> Figures obtained from The CIA World Factbook (accessed on 17 September 2010).



**Fig. 1** Socio-technical system framework. *Source* Geels 2002

function (Geels 2002). Existing regimes are characterised by path-dependence and lock-in, resulting from stabilising mechanisms of its selection environment—be it from incumbent actors and networks with vested interests and organisational capital; regulation, standards and cognitive routines that may blind developments outside of the normal focus; and existing machines and infrastructures that stabilise the physical structure through sunk investments and technical complementarities between components (Unruh 2000). Such stabilising mechanisms underpin the growth of regimes, but they also serve as obstacles. During transitions, these stabilising forces are weakened to allow new regimes to emerge, achieve stability and become dominant (Berkhout et al. 2010). The weakening of regimes depends on whether ‘niches’—the locus or space where novelties emerge—can be nurtured. Niches are like incubation rooms, shielding new technologies from the mainstream selection environment and providing a location for various learning processes, as well as a space for building social networks to support the innovations (Kemp et al. 1998). Finally, ‘landscapes’ forms an exogenous environment to the niche-regime that usually changes slowly but has a deep structuring influence on niches and regimes and on their interaction. Examples include deep-seated cultural and normative values, broad political coalitions and long-term economic developments (Berkhout et al. 2010). Hence, from this multilevel socio-technical perspective, novelty or innovation (in this case referring to more sustainable alternatives) has a hard time breaking through existing socio-technical regimes because the regime provides a disadvantage in terms of the selection environment. Therefore, transition can happen only when regimes open up, be it from strong top-down landscape pressure, or strong up-scaling of niche formation, or both.

As illustrated in Fig. 2, the up-scaling of niche formation is very much dependent on the collective success or failure of transition experiments that are shared by local

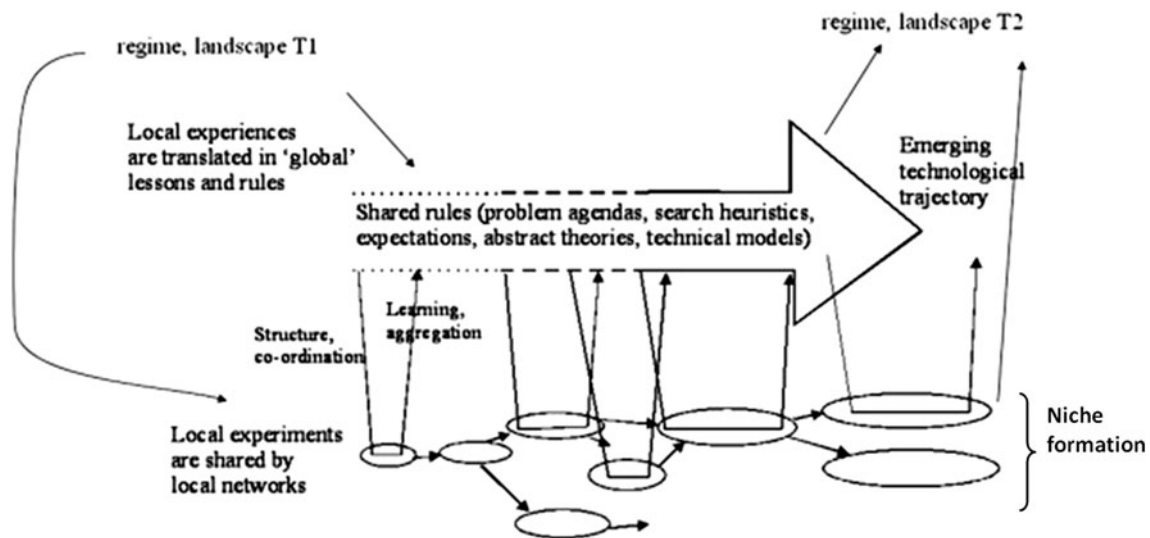
networks. Here, ‘transition experiment’ refers to innovation projects in which actors in society learn about socio-technical challenges of a new (sustainable) technology (Raven et al. 2010), while ‘up-scaling’ is defined as increasing the scale, scope and intensity of niches in building a constituency of new shared rules (problem agendas, search heuristics, expectations, abstract theories and technical models) behind the new technology—setting in motion interactive learning processes and institutional coordination and adaptation, which helps to create the conditions necessary for successful diffusion and development of those technologies (Kemp et al. 1998). Niche formation becomes successful if the new shared rules are able to transform the existing socio-technical regime (T1) to a new regime (T2) that is more in line with the transition agenda.

In this respect, Raven et al. (2010) asserts that many scholars tend to explain the success and failure of transition experiments by analysing the interaction between what they labelled as the ‘three internal niche processes’ (Box 1). In this article, this framework will be used as a theoretical lens with which to explore the role of religious communities in strengthening the transition experiments of recycling towards more sustainable MSWM in Malaysia.

#### Recycling, community participation and the role of religious communities in Malaysia

Generation of MSW in Malaysia has increased more than 91 % over the past 10 years due, in particular, to the rapid development of urban areas, rural–urban migration, increase per-capita income and changes in consumption patterns brought about by rapid national development (Agamuthu et al. 2009). The majority of the country’s MSW ends up in landfills, and 80 % of the 230 landfills currently operating in Malaysia will reach maximum capacity in a few years. The problem is aggravated further since land availability for landfill sites is scarce and is priced at a premium (Agamuthu and Fauziah 2006, 2011). A more innovative strategy to solve the MSW problem needs to be in place since the issue is not only contributing negatively to the quality of the natural environment, but also to the quality of public health as well (Miller 2005).

One of the policy challenges with MSWM is how to encourage the adoption of more environmentally sustainable solutions to address the solid waste problem. At present, approaches to deal with problem of solid waste can be divided into two main categories. The conventional approach views waste production as a largely unavoidable product of economic growth. It attempts to manage the resulting wastes in ways that reduce environmental harm, mostly by mixing the wastes produced together and then transferring them from one part of the environment to another. Technological solutions such as landfills and



**Fig. 2** Relationships between local experiments, niche formation and transition of regime (T1 → T2). *Source* adapted from Geels and Raven (2006)

incinerators can be classified under this approach. On the other hand, the more sustainable approach recognises solid waste as an important resource. It is based on the three Rs for dealing with wastes: reduce, reuse and recycle—commonly known as the 3R approach. It is a preferred solution because it tackles the problem of waste production from the beginning before it occurs, rather than at the end. It also saves matter and energy resources, reduces pollution, helps protect biodiversity and saves money (Miller 2005).

Recycling (using recyclable materials to make new products) as a part of the 3R approach, has gained increasing attention in both developed and developing countries (Troschinetz and Mihelcic 2009) as one of the key solutions for managing waste in a more sustainable manner. However, in developing countries like Malaysia, the conventional MSWM socio-technical regime still predominates, and sustainable alternatives like recycling have yet to be mainstreamed or diffused successfully. In Malaysia, a national recycling campaign was launched as early as in 1993 and re-launched again in December 2003. The government has even declared 11 November as National Recycling Day (Manaf et al. 2009). Despite significant efforts, however, the recycling rate in the country remains low. Indeed, 18 years since the first official recycling campaign was launched, a recycling rate of a mere 5.5 % has been achieved in the country. This rate is still off the mark compared to the 22 % goal by 2020 set by the Malaysian Government way back in the 1990s (Agamuthu and Fauziah 2006). This leads to questions pertaining to the effectiveness of the national recycling strategy, and its ability to contribute as an alternative to conventional MSWM in this country.

### *Recycling and community participation in Malaysia*

Community participation is critical to the success of a recycling programme as the efficient recovery of large volumes of high quality recyclable depends on effective public involvement. Moreover, good separation of wastes at the household level would reduce collection time, and hence the cost of collection (Hassan et al. 2000). For instance, a qualitative analysis of 23 developing countries by Troschinetz and Mihelcic (2009) has shown that two of the top factors influencing recycling are related to community participation: (1) public awareness of recycling (household education), and (2) public attitudes to recycling (quality and efficiency of waste collection and segregation). The paper also highlighted various findings on the importance of stakeholder involvement and collaboration as a catalyst to improve various aspects of community participation in MSWM. The importance of wider community participation is also emphasised in the work by Ahmed and Ali (2004)—particularly with regards to the significant role played by the so-called informal sector in the management of MSW in almost all cities in the developing world. The term ‘informal sector’ refers to activities that have the following characteristics: non-permanence and casualness; outside the scope of existing company law and government regulations; carried out on a small scale by less capitalised establishments relying mostly on household labour. Informal sector activities are also not regulated or controlled by government agencies—they exist and operate because of market forces or other socio-economic factors (see Salahuddin and Shahmim 1992 and Ali 1999 as quoted in Ahmed and Ali 2004, p. 469). Recycling activities by the religious community can be categorised under the informal sector (Zeeda et al. 2011b).



In fact, the key players in recycling in Malaysia are still predominantly within the informal sector, i.e., scavengers, collection workers, middle-men or traders and manufacturers (Hassan et al. 2000). The formal sector (the municipality and the solid waste concessionaries) that manages recycling as a part of the modern waste management system still plays a relatively minimal role as most of these activities are still carried out on an informal basis. This is mainly because recycling is at an infant stage in terms of policy implementation in Malaysia and disposal to landfills remains the key strategy for MSWM in the country (Manaf et al. 2009). Hence, the situation in Malaysia, at least at present, is similar to most developing countries, where ‘win–win’ co-operation between the formal and informal sectors is essential to increasing recycling rates (Wilson et al. 2006). However, it is important to note that with the recent approval of the Solid Waste Management and Public Cleansing Functions Act in September 2011 (The Star 2011a), the potential to increase recycling rates via the formal sector in Malaysia may be higher, as the Act contains a specific clause on the possibility of mandatory source separation by households, and various other policy strategies on 3R (Agamuthu et al. 2009). But even in a more legalised context, ensuring good participation by the community in recycling programmes is still essential—particularly so if enforcement is weak (Faber and Frenken 2009). Lack of enforcement and service delivery is a common policy failure in Malaysia (Gomez and Jomo 1999; Noree 2008), as in most developing countries (Khan 2002).

Within the policy literature, effective community empowerment, especially via the role of civil society (which may also include religious communities), has been regarded as one possible solution to solve this issue of public delivery (Polidano and Hulme 1999; Alexander and Smaje 2008). In recycling, one important driver behind community empowerment is increasing the level of education and awareness about recycling (Read 1999). This is well recognised by Malaysian policy makers. Awareness creation program accounts for 66 % of government budget allocation for recycling, compared to 29 % for creating recycling facilities and 5 % for remaining expenses (Chenayah et al. 2007). In fact, if everyone in the community supported the national recycling program, it was estimated that 20 % of MSW could be diverted from disposal sites (Manaf et al. 2009).

According to Agamuthu (2001) the awareness of the need to recycle among Malaysians is actually high, but very few actually practice recycling for various reasons. One of the key reasons is the lack of incentive and continuous motivation to conduct recycling. For instance, a local study revealed that even though householders were generally aware of recycling, their awareness is not necessarily translated into widespread recycling practices (Omran et al. 2009). This is because the basic motivation to conduct

recycling is very low. The top five reasons for non-recycling in this specific case includes the inconvenience of time, facilities being too far away/inadequate, not interested, no reward/money and not enough materials to recycle. Some of these obstacles can probably be overcome if individuals/groups are motivated enough to take up the extra effort. This opens up an interesting question: what are the motivating factors that can increase effective community participation in recycling programmes in Malaysia? Going back to earlier assertions on the power of religion to enhance environmental practices in Malaysia; this paper shall deal with this question by investigating the extent to which religious communities could play a role in this regard.

#### *The role of the religious community in recycling*

In general, investigations into the role of religion in MSWM are extremely limited in the literature. Even for cases where religion is recognised explicitly as an important factor influencing behaviour in waste management, investigations were restricted to minor inclusion in survey questions, particularly for socio-demographic characterisation, and with no or limited analysis. For the most part, religion as a part of socio-demographic data was included only for countries with a strong religious background such as Palestine, India, Bangladesh, Southern Thailand and Malaysia. In other contexts, religious factors are not mentioned at all. (For a more comprehensive review, see Zeeda et al. 2011b). Even given the lack of systematic research in investigating the issue of religion and the role of religious communities in MSWM, we consider that there is a need to conduct such research in the specific context of Malaysia—not only due to the country’s unique religious socio-demographics, but also, as mentioned earlier, to act as a response to popular academic assertions and recent policy rationale that the strong religious beliefs and foundation in Malaysia can be used to encourage the adoption of positive environmental practices in the country. However, how much of these ideals regarding the role of religion in the adoption of environmental practices can be translated into practice on the ground?

Responding to these questions is quite pertinent to improving recycling practices in Malaysia, for two reasons. First, religious communities are visibly seen to be conducting recycling activities in this country, reflecting its potential role in this regard; and, second, local policy makers need to seek creative and localised solutions to address the country’s persistently low recycling rate. Interestingly, even without systematic empirical justification, there have been increasing attempts by local policy makers to include the role of religious communities more formally into their state-level recycling programmes. Some visible examples include the efforts made by the Petaling

Jaya Municipality in the State of Selangor in providing sets of recycling bins to various worship areas such as mosques, churches and temples, while in the island State of Penang, churches and Buddhist associations has been included in the Penang Island Recycling Directory since 2005 (JICA Study Team 2005), reflecting official recognition on the role of these religious communities in Penang's recycling activities. In fact the contribution by the Buddhist Tzu Chi Association has been recognised as one of the key drivers behind the island's impressive relative national performance in recycling, i.e. an increase from 0.05 to 18 % recycling rate between the years 2000 and 2008 (Tang 2008). At present, it is claimed that Penang continues to forge ahead of other states in the country with a recycling rate reaching 23.8 % (The Star 2011b)—which is well above the national average of 5.5 %. Finally, in the State of Negeri Sembilan, a recycling programme involving more than 100 mosques was launched in May 2010. The aim of the programme is to encourage recycling among the Muslim community, and it is a unique collaboration between the National Solid Waste Management Department, the Negeri Sembilan Department of Islamic Religion and eight local municipalities (Harian 2011). The impact and success of this programme, however, has yet to be officially reported.

### Methodology and empirical evidence

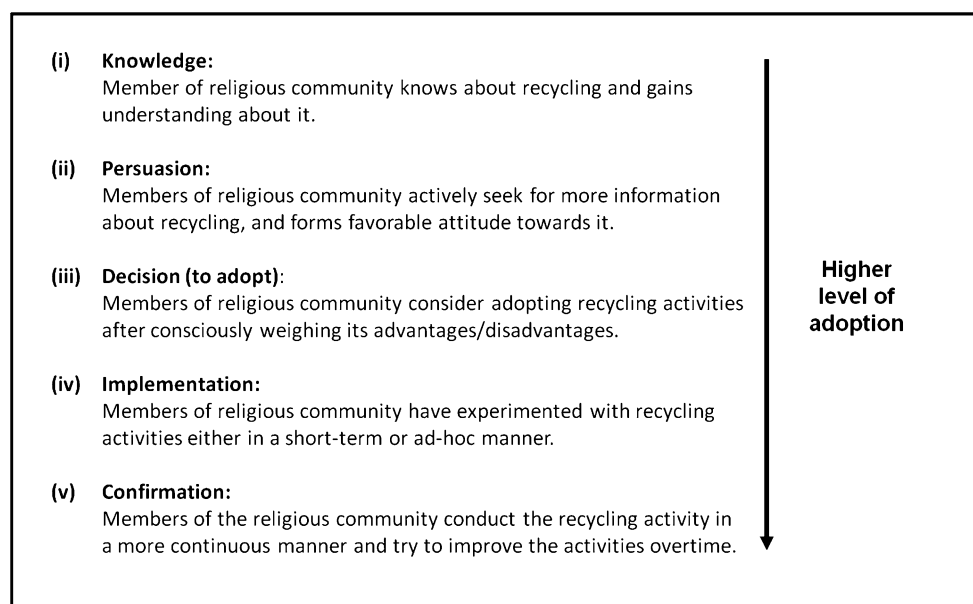
This paper employs an exploratory multiple case study on a number of recycling programmes (as a form of transition experiment) conducted by selected religious communities in Malaysia as its methodological approach. 'Religious community' in this context refers to a group of individuals with

common religious interest, while 'innovation' (in this case, recycling) refers to an idea, practice or object that is perceived as new by the community. Recycling programmes are considered more 'successful' if the religious community has gone through more innovation stages that are required for a successful adoption of innovation (see Fig. 3). This selection criteria was developed based on the Five-Level Innovation Model suggested by Rogers (1995) to determine the extent to which new innovation has spread through cultures.

All of the case studies were located at the state of Selangor, Malaysia and concentrated in high and middle-income suburban areas. Selangor was selected as the geographical boundary for two reasons: (1) it has the highest amount of MSW generation amongst all states in the country (Nagendran 2009); (2) compared to many other states in country, it has been at the forefront in conducting campaigns, setting-up policies and providing related facilities on recycling (Hassan et al. 2000; Agamuthu 2001). Key features of recycling activities conducted by each religious community were explored for each case, and this exploration was analysed qualitatively using data collected from semi-structured interviews, documentation and direct observations.

Under close supervision by the authors, preliminary investigations on several recycling programmes by religious communities in Selangor were first conducted in mid-2009 by research assistants belonging to each of the respective religious traditions. This enabled easy access, deeper communication and higher involvement in the community during the initial data collection process. Individual reports were then submitted to the researchers in order to provide a general picture of the phenomena. Subsequently, at the end of 2010, a follow-up interview, direct observation and further documentation and analysis were

**Fig. 3** Selection criteria for choosing successful cases in the study. *Source* own, adapted from Rogers 1995



**Box 1** Transition experiments and the internal niche processes. *Source* Raven et al. 2010

1. **Building social networks:** In the early phases of development, social networks are still fragile. Transition experiments require new combinations of actors, often coming from previously unconnected fields and disciplines. So experimentation in niches requires new actors to get together and make new social networks emerge. Building social network is considered good when (1) the network is broad (including firms, users, policy makers, scientists, and other relevant actors from the science and technology domains, and the policy domains and the social domain, including both regime actors and outsiders); (2) when alignment within the network is facilitated through regular interactions between the actors. In the case of social innovation in particular, the first criterion is important to ensure outsiders are not excluded from the transition experiments
2. **Voicing and shaping expectations and visions:** Various actors participate in transition experiments on the basis of expectations. Articulating expectations is important to attract attention as well as new actors, in particular when an innovation is still in early development, and functionality and performance are still unclear. Expectations also provide direction to development; they act as cognitive frames for making choices in the design process. The process of voicing and shaping of expectation is considered good when (1) an increasing number of participants share the same expectation; and (2) when expectations are based increasingly on tangible results from the experiments
3. **Learning process:** A good learning process enables adjustment of the technology or social embedding to increase chances on successful diffusion. A good learning process is (1) broad—focusing not only on techno-economic optimisation, but also on alignment between the technical (e.g., technical design, infrastructure) and the social (e.g., user preferences, regulation and cultural meaning); and (2) reflexive—attention is paid to questioning underlying assumptions such as social values, and the willingness to change course if the innovation does not match the assumption

undertaken by the researchers on the most successful cases from the Buddhist, Christian, Hindu and Islamic case studies, respectively. These comprised the Buddhist community of the Tzu Chi Association, the Christian community of Beautiful Gate, the Hindu community of Batu Caves Temple and the Islamic community of Surau al-Husna. The case of the Tzu Chi Association was the most successful in many aspects and hence will be used much more extensively in our discussion compared to the other cases. Brief profiles of the four successful cases are described briefly in the following, and key empirical features of their recycling programmes are summarised in Table 1.

#### Hindu community of Batu Caves temple

The Batu Caves Temple is one of the Hindu religion's major sacred worship areas in Malaysia. Recycling activities at the temple started about 11 years ago, as a response to the re-launching of the national recycling day in the year 2000—and this has been on-going ever since. In addition, every year the temple also faces increased waste management challenges during the celebration of Thaipusam, with thousands of people gathering around Batu Caves to celebrate the festival. In the past 2 years, the temple has worked closely with other partners to organise a large recycling campaign during Thaipusam. This is the first ever initiative in the country to conduct a massive clean-up operation for a Hindu festival in the country.

#### Islamic community of Surau al-Husna

Surau Al-Husna is a small mosque that has been established for the residential community of Section 20, Shah Alam, Selangor. The surau has been built to provide a place for the Muslim community in the neighbourhood to

conduct prayers and other religious rituals, share religious knowledge and to gather for religious activities. Surau Al-Husna started its recycling programme since July 2005, and this has become a permanent feature in the surau ever since. The recycling programme enjoys strong support from its religious leaders and other members of the surau committee. Overtime, Surau Al-Husna has increased the amount of collection by expanding its recycling operations to a nearby all-purpose community hall and diversifying its recycling activities.

#### Christian community of Beautiful Gates

Beautiful Gates, a centre for the disabled under the Malaysian Chinese Methodist Church, was recognised by the government as a full-fledged foundation for the disabled in 2003. Beautiful Gates started their recycling program in the municipality of Petaling Jaya, Selangor in 2004. This was in line with the local government's efforts at the time to implement Local Agenda 21, with recycling being promoted as one of the core programmes. Recycling was also seen as a suitable environmental activity for the centre as it could also provide working opportunities, skills development and an extra source of income for the disabled. Initially, the activities by the Beautiful Gates recycling program was mainly to set-up and manage a recycling point at one specific location in Selangor on every first Sunday of the month, but it has since expanded, with the setting-up of more recycling points and recycling bins in other parts of Petaling Jaya.

#### Buddhist community of the Tzu Chi Association

Tzu Chi Merit Association is a Taiwan-based Buddhist non-profit charitable organisation with eight key missions:

charity, medicine, education, culture, bone marrow donation, international relief, environmental protection and community volunteerism. Tzu Chi came to Malaysia in 1989 and at present it has over 30 liaison offices in different parts of Malaysia. Tzu Chi's recycling ideas began in Taiwan in 1990, after the Grand Tzu Chi Master Cheng Yen started her environmental protection mission. She also urged all Tzu Chi volunteers to practice recycling in their daily lives with a loving heart. Since then, 4,500 recycling points have been established in Taiwan with more than 60,000 volunteers being involved in this mission. In Malaysia, the recycling mission started in 1995. Currently there are more than 600 recycling points spread all over the country (with about 150 points alone located in the state of Selangor and Kuala Lumpur) with an estimated 10,000 Tzu Chi volunteers actively involved in the mission. Their recycling programme is one of the most successful in the country and this was officially recognised when the association was presented with the "Award of Honour for Supporting the National Conservation Programme" in conjunction with Malaysia's Environment Day celebration on 9 November 2003.

## Findings and discussion

The empirical evidence from this research (Table 1) has demonstrated the various ways in which selected religious communities are able to conduct successful recycling programmes in Malaysia, but how far is this demonstrative of their potential role in strengthening recycling experiments that could eventually contribute to the long-term change required for a sustainable transition in the country's MSWM? We will try to provide some insights to this question by analysing the empirical evidence within the theoretical framework presented earlier in Box 1.

### Voicing and shaping expectations and visions

The success of transition experiments depends on the extent to which expectations from sustainable technology options are able to attract attention as well as new players, and eventually provide 'cognitive frames' for making choices in the design process (Raven et al. 2010). As a social group, the cognitive frame that resonates most to religious communities is usually based on divine, altruistic, communal and spiritual expectation and vision—which may also include religiously inspired environmental ethics. As a whole, all the religious communities included in this research started with the initial premise that recycling is an environmentally responsible action that is in line with their respective religious teaching, and therefore should be adopted and encouraged by the community. In fact, each

religious community has its own worldview on the relationship between human beings and the natural environment, and the important role and responsibility of the religious community in environmental conservation. Islam and Christianity emphasise the role of human beings as vice-regent or stewards of nature, Buddhism stresses the oneness and co-existence with nature; while both Hinduism and Buddhism believe in the idea of Karma, where acts of goodness towards nature will sow goodness in return. It is important to mention here that it is this rather idealistic expectation of the influence of religious environmental ethics that forms the rationale behind the call by local academics and policy-makers in tapping into the role of religion in environmental protection and sustainability in Malaysia (Zuhdi 2012; Mohd Hazim et al. 2012; Sharifah Zaleha and Hezri 2009; Adi 2007). However, tapping into their role is by no means automatic and straightforward, and depends very much on the level of creativity and commitment of the religious communities themselves.

From our empirical findings, the ability of some religious communities to conduct more successful recycling programmes is due mainly to the effective way in which religious vision and expectation are translated 'practically' within the religious aspirations of the community. One of the ways in which this was done was through the economic yet spiritual practice of "charity"—where recyclable items are sold to generate revenue, not for individual profits but for the greater good of the community. Indeed, the act of charity is a very common and important religious practice, irrespective of tradition. In three of the successful cases, proceeds from the recycling are being used for the purpose of charity that is connected closely with specific motivation shared by members of the community. In Surau Al-Husna, proceeds are being used to improve the surau as a communal area; in Beautiful Gates, proceeds are being used to help generate income for the disabled; while in Tzu Chi, proceeds are being used to fund relief efforts in different parts of the world. In comparison, the recycling programme by the less successful case of the Batu Caves Temple is totally non-monetary. All recyclables in the temple are collected by the local municipality as no financial returns are expected from their recycling activities. This non-profit orientation also affects the type of recyclables that are eventually collected. Compared to the other cases, the temple community limits their collection to paper, cardboard, plastic containers and aluminium cans—while the other communities also included broader categories of recyclables such as clothes, electronic devices, furniture, iron and used cooking oil for their higher monetary value. Rather than depending on the municipality, recyclables collected by latter are mostly sold—either directly in their premises, in thrift shops or to private recyclers. Therefore, the combination between recycling and the practice of



**Table 1** Features of recycling activities conducted by selected religious communities in Malaysia. *Source* Zeeda et al. 2011b

Features	Batu Caves temple (Hinduism)	Surau Al-Husna (Islam)	Beautiful Gates (Christianity)	Tzu Chi Association (Buddhism)
	Higher performance in various features of the recycling programme			
Period of recycling programme	11 years (2000)	6 years (2005)	7 years (2004)	16 years (1995)
Waste collection and segregation facilities	A few sets of recycling bins within the temple	Two recycling points, (one at the surau and another at the community hall); 1 set of recycling bins at the surau	1 recycling point (every month) and 1 set of large recycling bins at Beautiful Gates building; 50 sets of small recycling bins in various locations in Selangor; 1 recycling centre; 3 lorries	150 recycling points every month in various locations in Selangor, 7 recycling centres
Type of recyclables collected	Paper, plastic containers, glass, aluminium cans; cardboard	Paper, plastic containers, glass, aluminium cans; electronic devices; iron; used cooking oil	Paper, plastic containers, glass; aluminium cans; clothes, furniture; electronic devices	Paper, plastic containers; glass, aluminium cans, clothes, metal items, electronic devices
Final sales/handling of recyclables	Handled by the municipality	Sold to private recyclers	Buyers visit centre to buy recyclables Sent and sold to private recyclers Sold in a thrift shop and flea market	Sold to small and large private recyclers
Motivation to recycle	Environmental protection	Environmental protection	Environmental protection	Environmental protection Charity
Use of proceeds from the sales of recyclables	Not relevant (activity is totally non-profit)	As a source of funds for the maintenance and repair work of the surau and other religious activities	Charity As a source of income for disabled workers and as additional funds to maintain activities in the Beautiful Gates centre	Cultivation of spiritual lifestyle As a source of funds for charity and relief work under the Tzu-Chi association
Human resource	Temple supervisor, temple cleaners and volunteers	Surau committee and volunteers	Disabled staff members of Beautiful Gates, with some assistance by volunteers	Volunteers—with some support from the association
Organisational structure	Temple management	Surau management (small mosque)	Christian centre for the disabled	Movement of volunteers—with support from Tzu Chi Association liaison office
Leadership (and role model)	No information	Initiated by Mr Hamzah, a surau committee member. Good support from Imam and surau committee	Initiated by Pastor Sia Siew Chin, founder of Beautiful Gates	Initiated by Grand Master Cheng Yen in Taiwan. This inspired many Tzu Chi volunteers in Malaysia to set up their own programmes in various neighbourhoods
Continuous improvement	Organising large scale volunteer-led recycling campaign for days with high generation of waste	Deployment of recycling bins and recycling points; more long-term arrangement with recyclers to collect and buy recyclables; recycling of used-cooking oil	Deployment of recycling bins and recycling points; placement of recycling bins nearer to household; setting up more permanent recycling centres; more long-term arrangement with recyclers to collect and buy recyclables	Deployment of recycling bins and recycling points; placement of recycling bins nearer to household; setting up of more permanent recycling centres; more long-term arrangement with recyclers to collect and buy recyclables

Table 1 continued

Features	Batu Caves temple (Hinduism)	Surau Al-Husna (Islam)	Beautiful Gates (Christianity)	Tzu Chi Association (Buddhism)
Support from other organisations	Local municipality Private firms NGOs Visitors to the temple	Local municipality Local politicians Resident association	Local municipality Foreign foundation Churches Embassy of Japan Some neighbourhoods around Petaling Jaya and recently expanding in other parts of Selangor.	Local municipality Resident association Network of Tzu-Chi volunteers worldwide Various neighbourhoods around Selangor.
Community outreach		One neighbourhood in Selangor.		

charity not only provides a viable economic incentive, but also drives the community to be more entrepreneurial, and to upgrade their programme creatively with other types of recyclables.

Interestingly, the most successful case of the Tzu Chi Buddhist community has gone a step further by making recycling part of a spiritual lifestyle. In this case, cultivating the discipline to recycle as a part of everyday life is considered as a noble spiritual practice for its adherents. The practices are strengthened further through the leadership of the Tzu Chi Grand Master, who not only preaches recycling but who is also an exemplary recycling practitioner herself.

“Recycling work benefits society and oneself. After participating in collecting and sorting recyclables, many volunteers realize how arduous this work can be. As a result, they discipline themselves to adopt a thrifty lifestyle and do their best to appreciate the resources that they use. Through participating in recycling, many people at Tzu Chi recycling stations even rediscover lost happiness and health. We have seen numerous examples of people who were originally afflicted with depression or drug addiction cleanses away the garbage in their minds through the act of sorting through physical garbage. They find joy and strength to start life anew and bring happiness back to their families.” (A quote by Master Cheng Yen, taken from Chang 2008).

The Master also regards the recycling station as “the fertile ground for spiritual cultivation”, while recycling volunteers are likened to “grass roots that hold onto the ground tightly in protection of the lands” (Chang 2008). It is evident that this deep vision and leadership to inculcate recycling as a ritual for spiritual growth is the main reason why the recycling programme conducted by the Tzu Chi association has grown much faster and persisted much longer (more than 15 years) compared to most other initiatives in the country. It can also explain the high level of participation, perseverance and proactiveness of Tzu Chi volunteers to set up and manage their own recycling programmes in their respective neighbourhoods, even with limited administrative support. This is because the driving force and cognitive frame to recycle is not too dependent on external enforcement or facilities for recycling (which, as mentioned above, is quite lacking in Malaysia), but more on the internal motivation of doing ‘good’ and ‘being compassionate to others’. Therefore, even though recycling activities at the national level lack participation, activities by the Tzu-Chi volunteers have been exemplary and have defied many odds—not only in Malaysia, but in parts of other developing countries as well (Oates 2008).

#### Building social networks

In the early phase of the transition process, social-technical network to support sustainable innovations is still fragile.

So experimentation in niches requires new actors to get together to make new social-technical networks emerge. A good network is characterised by broad participation by a variety of actors that form strong alignments with each other over time (Raven et al. 2010). The religious community, we argue, can provide a unique platform on which to form such a network.

One possible reason why the religious communities observed in this study were able to ensure the sustainability of their recycling programmes is due partly to the established institutional structure in which they operate. Religious communities, be they Hindu, Islam, Christian or Buddhist, in their own unique way have different forms of formalised establishments and deeply ingrained rituals, which in turn could be used to strengthen recycling programmes. For instance, the role of houses of worship, such as mosques, temples and churches, is very central to religious life. These are the places where worshippers of each religion congregate and where many community-based religious activities are conducted, be it in terms of religious worship, education or acts of social service. In this study, one could see the use of such a platform, particularly in the case of Surau Al-Husna and the Batu Caves temple. Both the surau and the temple have their own management structure and this provides a strong platform for managing the recycling programmes systematically. Other than houses of worship, religious communities also have other forms of organisational structure. For instance, Beautiful Gates is a small centre under the umbrella management of the Malaysian Chinese Methodist Church, and was established for the specific objective of helping those with disabilities. The centre has its own management structure and its activities have been developed in such a way that it can assist disabled people to be more independent in their lives. It is under this overarching objective of helping the disabled around which the Beautiful Gates recycling programme has been designed and managed. On the other hand, in the case of the Tzu Chi Association the recycling programme is governed by a hybrid organisational structure—combining both centralised and decentralised style of management. The decentralised part is the bottom-up approach of using Tzu Chi volunteers to set-up independent recycling programmes in their own neighbourhood. Each of these programmes is unique and is based on the activity of a group of Tzu Chi volunteers in a particular area. However, these scattered voluntary groupings are also supported by the centralised Tzu Chi administration, especially in terms of the provision of general resources, information, socialisation and training. Other than this, the Tzu Chi volunteers are also equipped with various communication channels (specialised TV channel, websites, videos, technical training, etc.) to gain ideas, lessons and inspirations

from other Tzu Chi volunteers conducting recycling initiatives in other parts of the world.

Interestingly, even though these religious organisations and institutions are conventional in their religious activities, they transform these into a novel platform when adopting a new environmental activity like recycling. Furthermore, religious adherents in Malaysia are rather heterogenous in terms of their age, education, occupation, income level and cultural background. This provides a ready-made platform for various types of actors who are already aligned to each other in terms of their ‘religious belief’ to work together in dealing with recycling—a unique advantage in terms of ‘diversity’ and ‘alignment’ in building-up effective social networks for transition experiments. Other than these advantages in the composition of their internal network, religious communities also receive good support from external actors to enhance their recycling programmes. This includes the municipality, private firms, NGOs, local politicians, residents associations, foreign foundations, embassies, international religious networks, etc. Interestingly, most of these linkages are formed via the initiatives of members of the religious community who are also members of these external actors. Religious connection motivates them to initiate and strengthen these connections.

Interestingly, all religious communities included in this study are quite open to include the general public in their recycling activities as well—demonstrating their ability to expand their activities beyond their religious social space. Even though management of their recycling programmes is conducted by their own members, each community accept recyclables from any member of the general public, regardless of creed. In turn, the response from the general public is also encouraging and non-exclusive. Hence, in terms of public outreach, collectively the religious community has the potential to encourage broader public participation in recycling—be it at the level of a house of worship (Batu Caves Temple), a small neighbourhood (Surau Al-Husna), a municipality (Beautiful Gates Centre), or even at the level of a State (Tzu Chi Association). In fact, our interviews revealed that communication and knowledge exchange on recycling activities has actually taken place between different religious communities—especially between the Chinese-dominated Christian and Buddhist communities. This, however, opens up another interesting question on whether the strength and expansiveness of religious social networks in recycling experiments is related closely to the membership of a particular ethnic group, i.e. the highly entrepreneurial and strongly networked Chinese community (King 1991). On this note, it is important to highlight here that members of the Hindu community comprise mostly the Indian ethnic group, while Islam is dominated by the Malays (although there are a

significant number of Chinese and Indian Muslims as well). A deeper comparative study is required to clarify this important sociological peculiarity.

As mentioned earlier in the literature review, the role of religious communities has not been researched adequately in the literature. Therefore, not much is known about their position in the structure of a country's MSWM. From our empirical findings, we have found that the activities of religious communities can be categorised broadly under the MSWM informal sector. In fact, religious communities play an interesting combination of roles, whereby their activities encompass various categories under the informal MSWM sector: from stationary waste collectors and microenterprises to community-based organisations (CBOs) and non-governmental organisations (NGOs) (see further elaboration in Zeeda et al. 2011a, b). Hence, their potential in strengthening the MSWM informal sector needs to be researched further.

### Learning process

In addition to the sharing of vision and strengthening of social networks, another important element to ensure the effectiveness of transition experiments is good learning processes that allow the necessary adjustment in socio-technical embedding to increase the chances for the experiments to diffuse. These include socio-technical alignment, techno-economic optimisation and the reflexivity to make necessary adjustments according to the ongoing expectations of the community (Raven et al. 2010).

Even though religious communities are usually known for their institutional rigidity, their recycling activities do display signs of learning and flexibility. Our empirical evidence shows that religious communities have undergone a learning process to increase their knowledge about recycling, not only in terms of technical design and infrastructure, but more so on how their recycling programme can be integrated effectively within the social needs, preferences and cultural meaning of their respective communities—contributing to the strengthening of socio-technical alignment of recycling practices within the community. This can be seen from the fact that recycling programmes, at least in successful cases, have become much more systematic and integrated over time, while at the same time catering to their unique circumstances. In the majority of cases, religious communities employ mainly “communal collection systems” for their recycling programmes. Basically, this system takes material from households to collection points, and then collectors take the waste from this communal storage (Agamuthu 2001). In these cases, the collection points/communal storage will either be the religious building itself or dedicated recycling

centre/area/large bins that have been set-up by the religious community for this purpose. This design characterises recycling programmes that are aimed to cater to a residential area or neighbourhood, as in the case of Surau Al-Husna, Beautiful Gates Centre and Buddhist Tzu-Chi Association. In this type of system, the rate of collection will increase once members of the neighbourhood are familiar with the location of the recycling points and therefore able to routinely send their recyclables. In the case of the Batu Caves temple, the objective is a bit different. Its main purpose is to manage recyclables for temple operations, especially the waste generated by the large number of visitors (including tourists) that visits the temple. This is more complicated, as visitors come and go and, unlike the permanent characteristics of a neighbourhood, it is much more difficult to establish a regular routine in this type of community. Therefore, their *modus operandi* is much more dependent on the collection of recyclables by cleaners at different parts of the temple. During big events such as Thaipusam, the temple also requires support from a large number of volunteers to help them with this laborious collection process.

Other than systematic collection, religious communities also ensure that wastes are segregated into the right categories. How this is done depends on the facilities and sometimes on routines that are already well-embedded in each religious community. For instance, in Surau Al-Husna, the monthly communal practice of *gotong-royong* (a type of collective social routine to clean the surau) has also included waste segregation as part of its activity. Similarly, the Tzu Chi Association has also used waste segregation activity (which is done immediately on the day on which the recycling points are set up) as a spiritual activity for its community. This is to encourage their volunteers—young and old and from all walks of life—to cultivate the spirit of recycling while getting together to conduct meaningful action for the community. While in the case of Beautiful Gates, segregation activities are conducted mainly by the disabled staff, as a part of their skills development activities.

Finally, religious communities have also shown the ability to learn by their continuous efforts to improve and diversify their recycling operations. For instance, in most cases, communities began their recycling programme with one recycling point or one set of recycling bins in a particular area, but over time this has graduated into bigger initiatives and/or much more permanent and sophisticated facilities. This includes the upgrading of the designs of their recycling bins, increased deployment of recycling bins and recycling points in more accessible areas around Selangor, placement of recycling bins at locations nearer to households, setting-up of more permanent recycling centres, organising large scale recycling campaigns for events

with high waste generation, and more long-term arrangements with recyclers to improve collection and sales of recyclables. In some cases, the communities have also conducted additional activities that are unique to the specific needs/objectives of their community, like the recycling of used-cooking oil that was used for preparing food for religious activities in Surau Al-Husna, the recycling of coconuts used in religious ceremonies by the Batu Caves temple, the search for more avenues through which to sell recyclables in order to increase income for the disabled by Beautiful Gates, and the widespread expansion of recycling points in more and more neighbourhoods by the Tzu Chi volunteers in their efforts to increase awareness about the spirit of recycling.

## Conclusion

This paper has provided empirical-theoretical insights on the potential role of religious communities in strengthening recycling experiments. Based on the internal niche processes framework, we suggest that this ‘potential role’ is based on:

1. The ability of religious communities to voice and shape expectations and visions for recycling: overall, recycling is perceived as good religious conduct. Strong adherence to religious vision can encourage members of a religious community to start recycling from a religious motivation. However, if the design of the recycling programme co-evolves well with the on-going expectations of the religious community (e.g., their religious teaching, leadership and spiritual imagination), the recycling programme could persist for a long time and provide broader influence.
2. Their ability to build social networks for recycling: each religious tradition has a well organised and long-established organisational and institutional structure. This can act as a stepping stone to provide various types of resources in supporting their involvement in recycling. In addition, members of the religious community have diverse backgrounds, but are aligned socially by their ‘religious belief’. This religious affinity can provide an additional driver in the build-up of social networks. The study also observed—through evidence of their ability to include the general public in their recycling activities, and their ability to play multiple roles within the MSWM informal sector—that religious communities can extend beyond their protective space.
3. Their ability to learn and undergo continuous improvement: in addition to their ability to build acceptance and form networks in recycling, religious communities

have also demonstrated their ability to learn continuously about the socio-technical aspects of recycling and improve their recycling programmes over time. It is also interesting that the improvement was also observed to be very much aligned with the key motivation and needs of the respective religious groups, demonstrating a localised strategy of their recycling programme.

In addition, the findings also reveal that the role of religious communities needs to go beyond general idealism on the positive influence of religious ethics in inducing environmental practices, as emphasised in local literatures. This is because the role of religious communities in recycling is also highly dependent on the unique socio-religious features of each community, and how these unique features are utilised strategically to support and enhance different aspects of a recycling programme/experiment. Indeed, both ethical and sociological explanations have to be combined to provide more concrete explanations on why religious ideals can be translated into effective practices on the ground. These sociological aspects could include their organisational and institutional structure, religious routines, leadership, membership, position in the broader community, etc. This is clearly apparent when the most successful case of the Tzu Chi Association is compared to the other cases. The ethical and sociological aspects of the Buddhist Tzu Chi Foundation has more far reaching impact compared to the other cases because of the multiplicity of their ethical visioning, the high level of leadership, the flexibility of their organisational structure and the effectiveness of their communication channels.

Finally, this paper concludes that religious communities have the ‘potential’ to provide a localised platform (with specific ethical and social resources) where sustainability experiments can be nurtured, and eventually grow into a unique ‘cultural niche’. This could add diversity to the type of niches that could be developed for sustainability transitions, which in turn could increase the chances of up-scaling of niche formation. It is important to note, however, that the findings in this paper are based on a very limited number of cases, within the particular context of recycling in an urban community in Malaysia. Hence, the evidence in this research can provide only early insights into the role of religious communities in enhancing transition experiments for MSWM. In order to ascertain whether this idea demands policy attention, more investigation needs to be done in other contexts, covering more cases involving diverse institutional structures within each religion, be it houses of worship, NGOs, associations, foundations and even schools—and also other types of sustainable solutions for MSWM. Nonetheless, even with this limitation, the early findings presented in this paper



open up one's view on the role of religious communities in enhancing the process of sustainability transitions—at least for a country like Malaysia where religion has a strong influence in the social-cultural landscape and day-to-day activities of public life.

**Acknowledgments** Our sincere appreciation to our research assistants, Miss Siti Maisarah (Islam), Miss Pei Sang (Buddhism), Miss Jing Xuan (Christianity) and Miss Nagaletchumy (Hinduism) for conducting preliminary work for this study and to the University of Malaya for providing the required financial assistance.

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