



GetGreen Vietnam: towards more sustainable behaviour among the urban middle class



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ABSTRACT

In Vietnam, the middle class is expected to grow from 12 million to 33 million people between 2012 and 2020. The growth causes an increase as well as a shift in consumption. Products that were not accessible or affordable before will become increasingly so, such as cars, dishwashers, meat products and air-conditioning. In urban areas the changes are most prominent and so are the side effects: increased amounts of waste, smog, pollution and use of fossil energy or pesticides.

The main objective of this study was to identify sustainable behaviour that followed or did not follow from the intervention project GetGreen Vietnam. 604 urban middle class consumers participated in a series of sustainable consumption trainings. Before, during and after the trainings, quantitative and qualitative data was collected on 90 sustainable actions.

64% of the participants self-reported to be engaged in a sustainable action before the intervention and this percentage increased to 80% after. The group environment and activity-based meetings of GetGreen Vietnam project (GGVN) were critical for the success of the intervention. Participants reported that before GGVN certain actions were already habitual as a money saving strategy (e.g. sparse electricity use or food leftovers re-use) or due to past scarcity (e.g. sparse water use). Many participants reported the intention to buy sustainable products but fewer participants took action to do so.

A powerful strategy toward more sustainable consumption in Vietnam can be to create more group-based activities around the themes of energy and shopping for food. A twofold approach is needed that both installs new sustainable consumption patterns and keeps old habits rooted in daily rituals. Role models should set an example for the young population and consumers and (Vietnamese) producers should be better connected to increase mutual trust and transparency.

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1. Introduction

In Vietnam the middle class is rapidly growing due to economic prosperity (GSO, 2012; KPMG, 2012). Some even estimate a growth from 12 million in 2012 to 33 million in 2020 (BCG, 2013). The newly formed middle class, in emerging markets such as Vietnam, is considered the main group that is affected by the economic prosperity (Nguyen, 2003). The middle class is the key to a thriving market oriented economy and sustaining future economic and

social development (Vu et al., 2007). Consumers are increasing and changing their consumption as a result (Schmidt, 2009; Speece and Nair, 2000; Speece, 2002). Products that were not accessible or affordable before are becoming increasingly so, such as cars, meat products, dishwashers or air-conditioning (Waibel, 2012). The Household Living Standards Survey of the General Statistics Office of Vietnam (GSO, 2012, p. 287) shows that in less than a decade the number of durable goods per household increased drastically, especially in urban areas. Between 2004 and 2012, the number of motorbikes per 100 urban households has risen from 96 to 146, telephones from 78 to 213, refrigerators from 45 to 76, air conditioners from 8 to 31 and washing machines from 21 to 49.

The negative consequences of increased prosperity are the visible side effects of consumption: increased amounts of waste, smog pollution, use of pesticides, and fertilizer and fossil fuel

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energy use in the agricultural sector. People in urban areas complain about air pollution, streets full of waste and food safety (De Koning et al., 2015; TNS, 2009; Waibel, 2012). However, little is known about how Vietnamese consumers contribute to increasing the sustainability of their homes, neighbourhoods and cities.

A sustainable consumption intervention for the Vietnamese urban middle class was implemented in the form of a series of group trainings. Recommendations from similar previously executed interventions (e.g. GAP, 2014; DEFRA, 2008; Staats et al., 2004) were followed: the trainings were organised in groups for social support, highly motivated participants were selected and a broad range of topics was selected to reduce a generalization problem. Consumption, in this study, was defined to include buying, using and disposal of products. Thus, focussing on all aspects of sustainable consumption behaviour.

The main objective of this study was to identify sustainable behaviour that followed or did not follow from an intervention among Vietnamese consumers. Quantitative and qualitative data were collected before, during and after a series of trainings for sustainable consumption. These formed the basis to develop initial directions for sustainable consumption strategies.

2. Background

2.1. Sustainable consumption in Vietnam

The literature on the Vietnamese middle class, and particularly the urban middle class, is sparse (but, see Fforde and De Vylder, 1996; King, 2008; Matthaes, 2011; Maruyama and Trung, 2007; Nguyen, 2003; Nguyen et al., 2010; TNS, 2009; TNS, 2011; Vu et al., 2007). Also, examples can be taken from Eastern European counterparts where sustainable consumption is also still a rather new concept. There, few people are aware of the concept, “sustainability”, and even less take action (Brizga et al., 2014; Shadymanova et al., 2014). Shadymanova et al. (2014) also point out that sustainable consumption can be ideologically taboo in countries with a soviet history. These examples may be relevant for the case of socialist market oriented Vietnam.

The limited research within Vietnam shows that the (urban) middle class is sandwiched between the high and low-income classes. This makes them extremely conscious and sensitive about their newfound status. Adopting a consumerist lifestyle is becoming a way to enhance one's identity and social status (KPMG, 2012; Maruyama and Trung, 2007; Nguyen et al., 2010; Fforde and De Vylder, 1996). They tend to engage in the consumption of luxury goods, aspire to foreign brands and value the quality and trendiness that are associated with these brands (Nguyen et al., 2010; TNS,

2011; Speece, 2002). Education, achievements and accessing news and information (increasingly through the internet) are additional ways to express status (King, 2008; KPMG, 2012; Matthaes, 2011; Vu et al., 2007).

Sustainable consumption in Vietnam is an urgent topic. The changes that are rapidly taking place lead to the opportunity to introduce new, sustainable behaviours. Lewin (1951) explains that in order to change towards new behaviours, old behaviours need to be ‘unfrozen’ and adapted into new behaviours that need to be ‘frozen’ again. One could say that currently the behaviours of the Vietnamese middle class are ‘unfrozen’ at the moment that provides an opportunity to introduce and “freeze” sustainable habits for the future. It is crucial now because it is hard to change habits after they have been “frozen” into a behavioural pattern. Developed countries now face this challenge of shifting towards sustainable consumption. However, in emerging markets there is time to guide consumption towards better patterns, before unsustainable practices or habits become embedded in a society's behaviour, possibly leapfrogging towards sustainable practices (Tukker et al., 2008). Despite the urgency, only limited research has addressed this topic in Vietnam (Waibel, 2012; TNS, 2009).

2.2. Strategies towards sustainable consumption

Most activities of sustainable consumption today deal with strategies of material substitution, pollution prevention, consumer awareness building and end-of-life management practices optimization (Mont and Plepys, 2008). These activities have not been sufficiently successful and the right approach yet needs to be found. A shortcoming of current strategies is that they focus on building awareness but they fail to establish actual behaviour change (Dembkowski, 1998; Tangney et al., 2007; Thøgersen, 2010).

Sustainable training interventions, similar to the one described in this study, have been executed in developed countries (e.g. GAP, 2014, 2006; DEFRA, 2008; Staats et al., 2004). But, strategies for sustainable consumption from developed countries cannot simply be copied to emerging markets such as Vietnam. The starting points, on-going changes and values are different (De Jong and Kroesen, 2007). In the developed world both green consumers and average consumers are aware that their consumption impacts the environment. For example, people know that using less plastic bags, recycling paper or using less water benefits the environment. However, this knowledge does not always make people act accordingly, even if they feel that it would be the right thing to do. This gap between intention and action is often referred to as the intention–action gap (Vera de et al., 2010; Thøgersen, 2010;

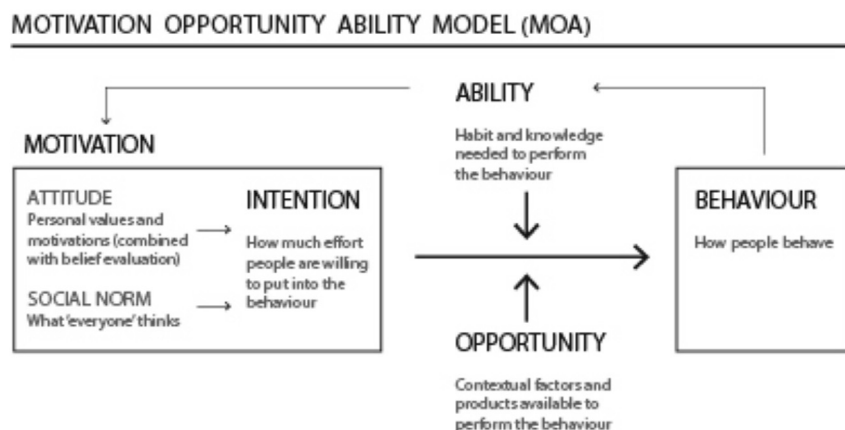


Fig. 1. The MOA model explained (Ölander and Thøgersen, 1995).

Vermeir and Verbeke, 2006; Young et al., 2010; Miniero et al., 2014) or green gap (Ogilvy and Mather, 2011).

Three components are needed simultaneously to increase sustainable consumption: motivation/intent, ability and opportunity (Tukker et al., 2008). Their relation to the intention-action gap, are well explained by the Motivation Opportunity Ability (MOA) model (Ölander and Thøgersen, 1995), see Fig. 1. This model assumes that intentions depend on personal attitudes and social norms. It also shows that the intention-behaviour relationship is moderated by ability and opportunity. This suggests that it could be that a low ability or a low opportunity is making it difficult to act on an intention, causing an intention-action gap. Therefore, the focus of the intervention in this study was to stimulate ability or opportunity components rather than motivational components affecting sustainable action. The materials & method section explains the detailed set-up of the intervention.

The MOA model was used as a theoretical basis for the intervention because simplicity was sought after. The MOA model provides this simplicity and consists of the three basic components that are also found in other, more complex behaviour change models. For example, at the core of the behaviour change wheel (Michie et al., 2011) are: motivation, capability and opportunity. Or, in the theory of interpersonal behaviour (Triandis, 1977), behaviour is explained by *habits and intention*, moderated by *facilitating conditions*. Or, in the Comprehensive Action Determined Model (CADM), Klöckner and Blöbaum (2010) use habitual, intentional and situational processes to predict ecological behaviour. These models all assume that external conditions and habitual processes are moderating factors between intention and behaviour. This sets them apart from the widely used model of Theory of Planned Behaviour (Ajzen, 1991), where only the direct effect of intention on behaviour is considered. However, Ajzen (1991) showed that the intention to perform behaviour, together with perceived behavioural control account for considerable variance in the actual behaviour.

3. Materials and methods

3.1. The GetGreen Vietnam project (GGVN)

Data for this study were obtained from the intervention project GetGreen Vietnam (GGVN), funded by the EU Switch Asia programme. The goal of GGVN was to stimulate change by training over one thousand consumers on sustainable consumption in urban Vietnam. The trainings were carried out in two phases of 26 groups. The first 26 groups were trained between January 2014 and August 2014 and the second 26 groups between October 2014 and June 2015. In this paper only the first groups are included because during the time of writing the second set of 26 groups were still being trained.

3.1.1. Design of the training content

The training content was developed by the GGVN project and constructed around 90 actions for sustainable consumption. The actions were drawn from previously executed sustainable consumption projects in developed countries (e.g. GAP, 2014; The UK sustainable consumption roundtable, 2006; DEFRA, 2008; Staats et al., 2004). Actions were systematically selected and adjusted to the context of urban Vietnam. The approach to consumption was broad: including buying, using and disposal actions. Actions were formulated in concrete and actionable terms because the goal of GGVN was to break patterns, widen people's (view on) opportunities and establish new habits. For the project, because of the focus on practicability, actions were also grouped according to context. There were 9 contextual clusters (Fig. 2) with 4–15 actions each.

3.1.2. Set-up of the trainings

The participants were trained during 6 meetings in 26 groups of 15–25 people, 604 in total (see Section 3.3 for details on selection). During the first meeting, participants selected two contextual clusters. The actions within these two specific clusters would become the group's focus. The following 5 meetings alternated between information and field trip meetings. To ensure the quality and consistency of the meetings, the GGVN project team trained a group of 40 people and selected 26 of them to be the trainer of a consumer group. During information meetings, the trainer introduced the actions within a cluster, provided background information and the participants discussed their previous experiences with the actions. Consecutively, the trainer organised a field trip where the actions were practiced in the actual context. For example: food certificates and labels were discussed during an information meeting. In a subsequent field trip, the group met in a supermarket where they were encouraged to look for the labels, understand them and help each other select a product.

3.2. Set-up of the sustainable action survey and monitoring activities

A survey was conducted among the 604 participants of the GGVN project. Before GGVN, participants were surveyed on all 90 sustainable actions and after GGVN only on the actions of their two selected clusters. During and after GGVN, monitors met with individual participants to verify their progress and to get feedback on the program (see Fig. 3).

3.2.1. Survey

The Sustainable action survey consisted of 90 sustainable actions (hence the name) with identical answers options. The options were: 'yes', 'no', 'I intend to' and 'not applicable'. Answering scales were not used because pilot tests had shown that participants find it hard to use scales. In the survey after GGVN the answer 'Yes, and I do this more' was added to the answer options:

- V = Yes, I do this
- X = No, I do not do this
- > = I intend to do this
- K = Not applicable
- + = Yes, and I do this more (only after GGVN)

Before GGVN, during the first meeting, participants filled out the survey individually for all 90 actions on A3 paper. The survey was in



Fig. 2. Cluster names and context.

GET GREEN VIETNAM (GGVN) PROJECT FLOW

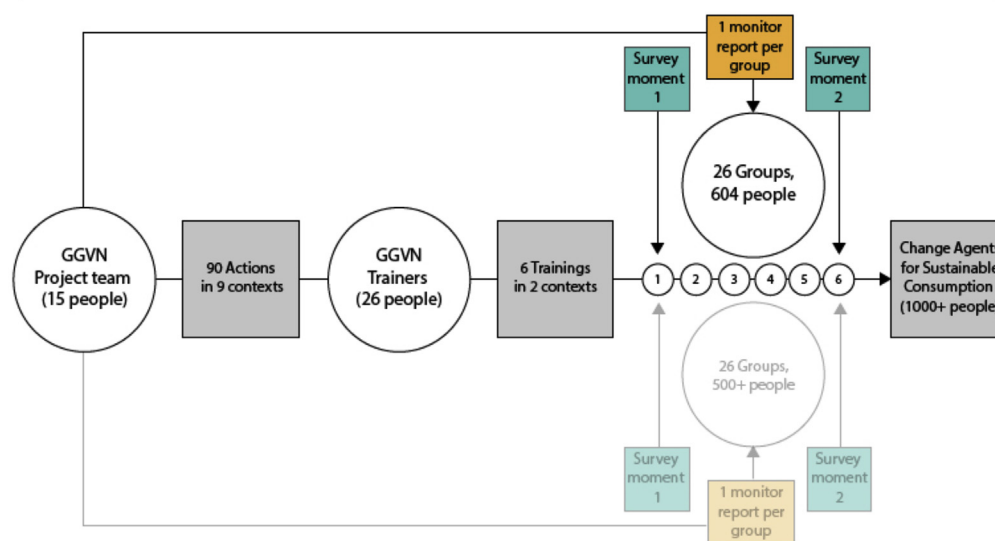


Fig. 3. Flow of the GetGreen Vietnam project and the data collection moments.

Vietnamese but an English version can be found in Fig. 4, and a full-page version in Appendix A. After GGVN, during the last meeting, the survey was conducted again, but only for the actions within the two clusters that the group selected. Also, this time the survey was not done individually but the trainers scored for each action how many participants answered 'yes', 'more', 'no', 'intending to' or 'not applicable'.

3.2.2. Set-up of the monitoring activities

Members of the GGVN project team fulfilled the role of monitors. They observed 2 or 3 meetings of each group to verify the quality of the trainings and the progress of the consumers. The monitors also interviewed 2 or 3 randomly selected individual participants about their progress after a meeting. After GGVN, monitors visited the homes of one participant per group to conduct a longer interview, this was video recorded. One monitor report was built per group based on the meeting observations, interviews and the final home visit. These reports were used to qualitatively add to the quantitative survey data. This adds to the understanding of why people did or did not do certain actions.

3.3. Participants

The participants of GGVN were recruited through the project's network and the personal network of the trainers. The selection criteria for participation were a high motivation for sustainable consumption, a middle-class income, an age between 18 and 55 and living in an urban area. Participants' motivation needed to be relatively high because the project was not focused on increasing motivation but on increasing action. Trainers identified this in a short interview before GGVN. A middle class monthly income was defined to fall between 5 million VND and 30 million VND (230–1380 USD). For a detailed definition of the Vietnamese urban middle class see De Koning et al. (2015). The urban areas were selected based on city size and spreading: Ho Chi Minh City (HCMC) (south), Ha Noi (north), Da Nang (middle) and Can Tho (south) are 4 of the 5 largest Vietnamese cities.

Participants were also selected within three groups of potential change agents: students, community members and office colleagues. Students were expected to be potential change agents because they will form the next generation; community members (mostly stay at

home mothers or retired citizens) because of their strong tie with the neighbourhood; and office colleagues because they can possibly influence office culture. Generally, participants were already a group before GGVN: being classmates, colleagues or members of the same community club. Building on these existing social structures was expected to support the continuation of activities after GGVN.

4. Results

The results are presented in four parts. First, the method of data analysis is generally described. Second the quantitative results of pre-project survey are presented and subsequently those of the post-project survey. The last part presents the qualitative results of the monitoring reports.

4.1. Data and analysis

The survey before GGVN received 604 responses. The average response rate per action was 93% or 564 participants. Participants sometimes left actions blank; therefore the total number of responses per action differed. These actions left blank were not treated as a no-answer or not applicable-answers but left out. Percentages of answers were calculated based on the amount of participants for each specific action.

The post-project survey received 501 responses. The average response rate per action was 24% or 115 participants. This is much lower than for the pre-project survey because the groups now only answered for the actions in the two clusters they had been working on. Also, throughout GGVN there were a number of participants that dropped out and did not complete the post-project survey: a total of 78 participants.

The 26 consumer groups all provided data of the survey before GGVN. One group did not provide data of the survey after GGVN: a group of 25 students from Da Nang. Table 1 contains an overview of the different groups in the data set.

The survey data were provided per group by the GGVN project team in excel. SPSS was used to perform the statistical tests: a value of $p < 0.05$ was used to determine statistical significance.

Some of the indices of the data were not normally distributed. Non-normality was probably caused by the low amount of responses, especially in the post-project survey. Therefore non-

Sustainable actions survey

Tick the box in front of the behaviour change

☒ = I do this
☐ = I don't do this
☐ = I intend to do this
☐ = This doesn't apply to me

3R at the Office/School

- ☐ Use stairs instead of the elevator
- ☐ Use your own cup for coffee/tea
- ☐ Give priority in buying local stationery
- ☐ Buy stationery in large quantities
- ☐ Buy lightweight recycled paper
- ☐ Buy refillable or recyclable office stationery
- ☐ Print two-sided
- ☐ Collect old paper
- ☐ Save paper tissue
- ☐ Stick signs to remind people to save electricity
- ☐ Use public recycling bins
- ☐ Collect and share recyclable office supplies
- ☐ Reuse office stationery
- ☐ Monitor what you throw away

Towards a Green Office

- ☐ Reuse food leftovers
- ☐ Use natural light and ventilation
- ☐ Perform two modes of light in office
- ☐ Use A/C and fans
- ☐ Use energy saving modes
- ☐ Maintain big electronic devices
- ☐ Buy furniture made from environmental friendly materials
- ☐ Buy certified furniture (FSC)
- ☐ Lease electronics
- ☐ Buy certified electronics (EPEAT, Energy Star)
- ☐ Hold internal competitions for zero waste

General information

Name _____

Age _____ years

Hometown _____

Highest education _____

Current occupation _____

Marital status _____

Household type _____

Household size _____ people

Household income _____ VND/month

Introduction

☐ Refuse plastic bags

☐ Don't litter

Live Like a Farmer in the City

- ☐ Eat organic food
- ☐ Reuse leftovers
- ☐ Use rain water
- ☐ Use natural cleaning agents

In and Around the Supermarket

- ☐ Make a shopping list
- ☐ Buy diverse food
- ☐ Buy food in season
- ☐ Prioritize to buy local food
- ☐ Buy food from reliable sources
- ☐ Prioritize environmental friendly packaging
- ☐ Buy discounted fresh food

On the Road Again

- ☐ Turn off your engine while idling
- ☐ Maintain your motorbike
- ☐ Buy a durable helmet
- ☐ Keep speed consistent
- ☐ Don't speed on the freeway
- ☐ Accelerate and brake smoothly
- ☐ Avoid traffic jams
- ☐ Share your motorbike
- ☐ Buy a sustainable motorbike
- ☐ Use public transportation
- ☐ Use a bicycle
- ☐ Use a car
- ☐ Sell old/disposal means of transportation

Energy Efficiency

- ☐ Limit using electricity at high peak time
- ☐ Unplug devices
- ☐ Combine A/C with fan
- ☐ Put A/C at 26°C
- ☐ Use natural light and ventilation
- ☐ Have green plants in your house
- ☐ Turn off lights when leaving the room
- ☐ Clean bulbs frequently
- ☐ Install energy saving bulbs
- ☐ Insulate at windows and doors
- ☐ Maintain big electronic devices
- ☐ Rent or borrow products
- ☐ Buy second hand items
- ☐ Buy 4 - 5 stars EE appliances
- ☐ Buy solar powered equipment

Bathroom of the Future

- ☐ Take short showers
- ☐ Use a water saving shower head
- ☐ Turn off the tap when not in use
- ☐ Use natural cleaning agents
- ☐ Use cloth tissues

Kitchen of the Future

- ☐ Position fridge 15cm from the wall
- ☐ Set fridge at 7°C, and freezer at -18°C
- ☐ Defrost the fridge regularly
- ☐ Store food according to directions on label
- ☐ Load your fridge up between 70 and 80%
- ☐ Apply First In First Out
- ☐ Plan cooking in detail
- ☐ Defrost food before cooking
- ☐ Let food cool down before fridging
- ☐ Use modern kitchen equipment
- ☐ Use the lid
- ☐ Prioritize using a microwave
- ☐ Compost food
- ☐ Monitor what you throw away

Home Recycling Station

- ☐ Don't burn waste
- ☐ Use a recycling station
- ☐ Monitor what you throw away
- ☐ Reuse packaging
- ☐ Get old household items to local charities

Fig. 4. Sustainable actions survey, English version.

parametric tests were used for the analysis. The analysis of the difference between certain categories of actions was done with the Kruskal Wallis H test to compare means. For the analysis of the difference between before and after GGVN the Wilcoxon signed rank test was used.

The 26 monitor reports (documents available upon request) were used to qualitatively verify and explain the quantitative data.

4.2. Before GetGreen Vietnam

The survey before GGVN shows which actions participants reported to perform before the trainings. It presents the amount of yes-, no-, intention and not applicable-answers for each of the 90 sustainable actions.

4.2.1. All actions

For an average action before GGVN, almost two third of the participants reported to do this (64%), 14% of the participants

reported not to do an action, 15% reported to intended to do an action, and 7% said an action was not applicable to them (see Fig. 5).

4.2.2. The 9 clusters of context

The GGVN project divided the 90 actions into 9 contextual clusters. On average, the actions in the cluster 'Bathroom of the Future' received the highest amount of yes-answers per action and 'Towards a Green Office' the lowest. The average amount of yes-answers per action in each context cluster can be found in Fig. 6.

No significant difference was found for the no-, intention, and not applicable-answers.

The difference for the amount of yes-answers between the context clusters was found to be significant by the Kruskal Wallis H test: $\chi^2(8) = 16.13$, $p = 0.041$. A post-hoc pairwise comparison revealed that the amount of yes-answers per cluster differed significantly for the cluster 'Towards a Green Office' and 4 other clusters ('Bathroom of the Future', 'Home Recycling Station', 'On the Road Again' and 'Around the Supermarket') and for 'Bathroom of the Future' compared to the clusters 'Energy Efficiency' and '3R at the Office'.

4.2.3. Buying, using and disposing actions

The 90 actions were also clustered into three types of action: buying ($N = 30$), using ($N = 43$) and disposal ($N = 17$) actions. The analysis showed that before participating in GGVN, participants

Table 1
Type of groups per city, before GGVN and after GGVN in brackets.

	Can Tho	Da Nang	HCMC	Hanoi	Total
Community groups	1	2	2	2	7
Student groups	3	1 (0)	2	2	8 (7)
Office groups	1	2	4	4	11
TOTAL	5	5 (4)	8	8	26 (25)

ANSWERS BEFORE GGVN

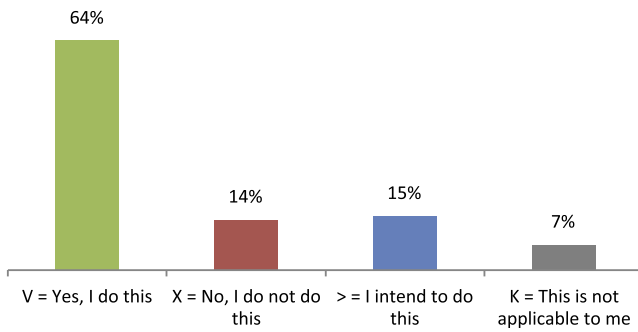


Fig. 5. Average response rate per action, before GGVN.

MEAN OF YES-ANSWERS

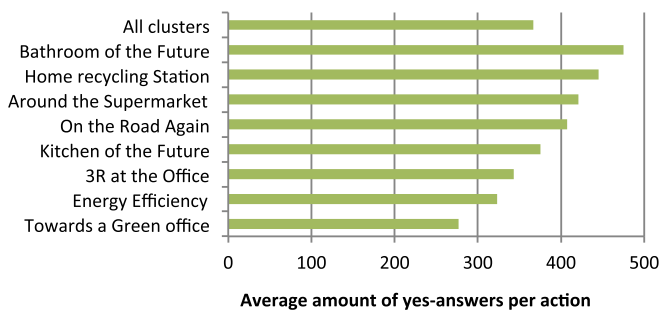


Fig. 6. Average amount of yes-answers (V) per action, per cluster, before GGVN.

said to intend to do more buying actions than using and disposal actions (Fig. 7).

The difference for the amount of intention-answers between the buying, using and disposal actions was found to be significant by the Kruskal Wallis H test: $\chi^2(2) = 6.85$, $p = 0.033$. A post-hoc pairwise comparison revealed that the amount of intention-answers for the buying actions was significantly higher than for the using and disposal actions. There was no significant difference between the using and disposal actions.

4.2.4. Differences between groups and cities

No significant difference was found between the groups from Ha Noi, HCMC, Can Tho or Da Nang (the four participating cities). Between the student and office groups a significant difference was found. Analysis showed that student groups gave more intention-answers than office and community groups; this shows clearly in Fig. 8.

A Kruskal Wallis H test showed that the intention-answers were not equally distributed among the students, office and community groups: $\chi^2(2) = 10.13$, $p = 0.006$. A post-hoc pairwise comparison showed that the student groups gave more intention-answers than both the community and the office groups. The amounts of intention-answers of the community and office groups were not significantly different.

4.2.5. The top 10 for 'Yes', 'No' and 'Intention'

The 10 actions, for which most participants answered 'yes', were mostly about preventing unnecessary energy use or not wasting energy, especially during cooking activities. For example 'using the lid of the pan' or 'letting food cool down before putting it in the fridge'. The three other activities were about not throwing trash on the streets and taking care of your wellbeing (see Fig. 9).

MEAN OF INTENTION-ANSWERS PER ACTION BEFORE GGVN

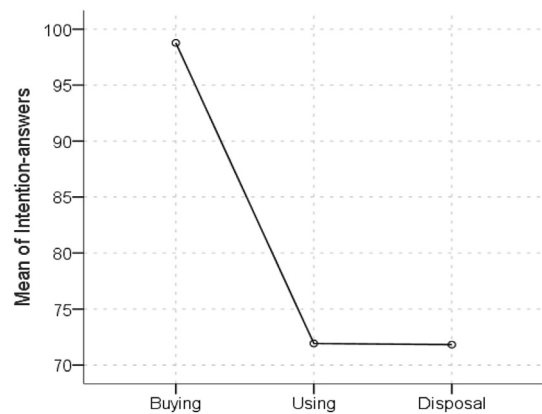


Fig. 7. The mean of the amount of intention-answers per buying, using and disposal action, before GGVN.

The 10 actions, for which most participants answered 'no', are quite diverse (see Fig. 10). Three unpopular actions involved using second hand, leased or borrowed products. Composting and the use of rainwater were not popular either. Other relatively unpopular activities were related to the office context. However, this is probably because not all participants worked in an office. Overall, these actions correspond highly to the actions that received a low amount of yes-answers or a high amount of not applicable-answers; the top 3 is exactly the same.

The 10 actions, for which most participants answered 'intending to do so', clearly fall into two groups. The first group consists of actions that involve buying special products and the second group of actions that tell you to include others (see Fig. 11).

4.3. After GGVN

After GGVN one extra answer was possible: 'I do this more' (+). The groups answered only for the actions in the two context clusters that they had been trained on. The total amount of answers per action was thus not the same. Actions in clusters that were selected by fewer groups also received less answers and vice versa. Calculations are therefore not based on the total amount of answers per action but on percentages of answers per action.

No group selected the cluster 'Bathroom of the Future' (5 actions) and the introduction actions (2 actions) were not part of any

AVERAGE AMOUNT OF INTENTION-ANSWERS PER ACTION

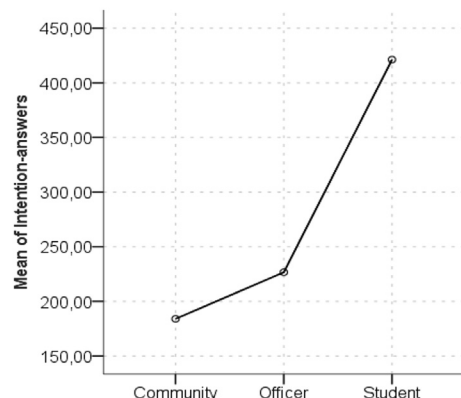


Fig. 8. Average amount of intention-answers per type of group, before GGVN.

TOP 10 YES-ANSWERS

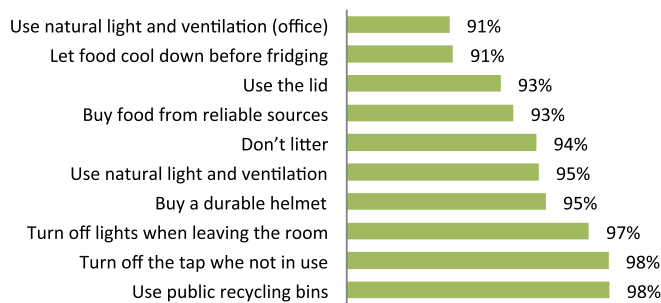


Fig. 9. The top 10 actions participants said they were doing already, before GGVN.

TOP 10 NO-ANSWERS

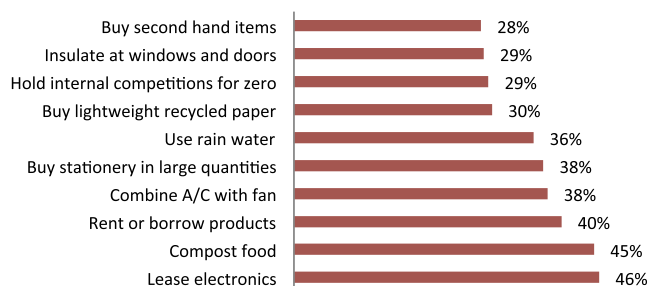


Fig. 10. The 10 actions of which most participants said not to do, before GGVN.

cluster. Therefore, the total amount of actions in the analysis of the survey after GGVN was 83 and not 90.

4.3.1. All actions

After the trainings of GGVN, the percentage of participants saying 'yes' (or 'more') for an average action increased to 80% (51% and 29%). Compared to 64% of yes-answers per average action before GGVN, this is an increase of 16% (see Fig. 12).

A Wilcoxon signed-rank test (see Table 2) showed that after GGVN the percentage of yes-answers combined with more-answers increased from 64% to 80% for an average action ($Z = -7.29$, $p = 0.000$).

4.3.2. The 9 clusters

After GGVN, the 8 context clusters did not differ significantly from each other in the percentages of yes-answers (nor did they for the other answers).

However, it is clear that the two most popular clusters were 'Energy Efficiency' and 'Around the Supermarket'; respectively 13

TOP 10 INTENTION-ANSWERS

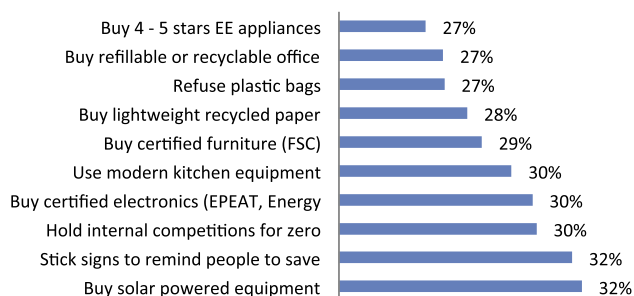


Fig. 11. The 10 actions of highest intention before GGVN.

and 14 of the 26 groups selected these clusters (see Fig. 13). The answers for the individual actions within these clusters can be found in appendix B. The two least popular clusters were 'Bathroom of the Future' and 'Towards a Green office'. The other 5 clusters were selected by 3–6 of the groups.

4.3.3. Buying, using and disposing actions

After GGVN, the buying actions received on average a lower percentage of yes-answers than the disposal actions. The buying actions, again as before, received on average a higher percentage of intention-answers than the using actions.

A Kruskal–Wallis H test was performed to compare the mean ranks of the percentages of yes-answers for buying, using and disposal actions. The test showed that the distribution of percentages of yes-answers of the buying, using or disposal actions was not the same: $\chi^2(2) = 7.41$, $p = 0.025$. A post-hoc pairwise comparison revealed that the percentages of yes-answers after GGVN were only significantly lower for the buying actions in comparison to the disposal actions: $\chi^2(1) = -19.51$, $p = 0.033$.

A second Kruskal–Wallis H test was performed to compare the mean ranks of the percentages of intention-answers for buying, using and disposal actions. The test showed that the distribution of percentages of intention-answers of the buying, using or disposal actions was not the same: $\chi^2(2) = 7.41$, $p = 0.021$. A post-hoc pairwise comparison revealed that the percentages of intention-answers after GGVN were only significantly higher for the buying actions compared to the using actions: $\chi^2(1) = 1.59$, $p = 0.030$.

4.3.4. Top 10 increase and decrease in yes-answers

The 10 actions for which the difference in yes-answers before and after GGVN was the highest are shown in Fig. 14. Two types of actions were identified: buying certified products and re-using products. In general, the buying actions received less yes-answers before GGVN, which left more room for improvement. Two other actions that changed a lot were single occasion actions: 'defrosting the fridge' and 'sticking signs to remind people to save'. A first explanation could be that before GGVN participants did not execute these infrequent actions but during GGVN they did. Many participants changed their response on composting food but it remained an action that scored below average after GGVN.

The post-project survey showed 10 actions with zero or negative change of yes-answers (see Fig. 15). Two types were identified: actions that need specific (product) knowledge and actions that involve the disposal of old products. These negative changes can be explained in several ways. First, some terms and actions were ambiguous or not clear affecting participants ability to fill in the survey. For example, participants did not know exactly what qualified as a 'sustainable motorbike' or 'energy saving' light bulbs. These were found to be the only ambiguous actions. Another reason

YES-ANSWERS BEFORE AND AFTER GGVN

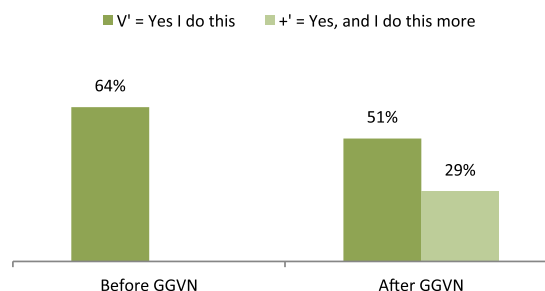


Fig. 12. The Average amount of yes-answers (V and + (more)) per action, before and after GGVN.

Table 2
Results from the Wilcoxon signed-rank test on the 4 answers before and after GGVN.

Wilcoxon signed-rank test	Before	After	Z	N	Sign.
Pair 1 V Yes- & more-answers before & after	63.5%	79.6%	-7.29	83	,000
Pair 2 X No-answers before & after	14.4%	4.6%	7.60	83	,000
Pair 3 > Intention-answers before & after	14.7%	10.8%	4.37	83	,000
Pair 4 K Not applicable-answers before & after	7.5%	5.1%	4.43	83	,000

CLUSTERS SELECTED BY NUMBER OF GROUPS

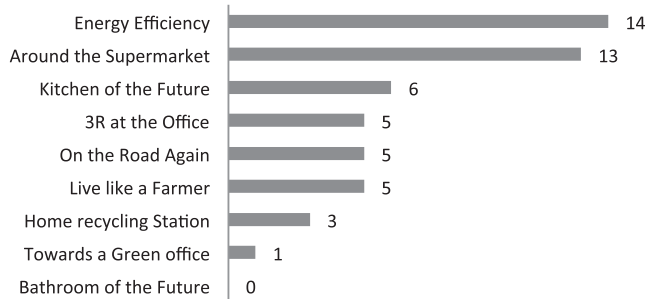


Fig. 13. Clusters selected by number of groups.

that can explain negative change is that participants became more aware of their actions throughout the program; when they started to pay attention to an action they realized they did not do it as much, such as 'turning off lights when leaving the room'. Or, participants became stricter with their interpretations of certain words and actions such as 'buying food from reliable sources'. However, ceiling effects could also have played a role because the majority of these actions had a high response rate before GGVN. The elaborate action of 'holding international competitions' was an outsider with few participants answering yes before and after.

4.4. The intention effect

The 10 actions that, before GGVN, received the highest rate of intention-answers were also singled out after GGVN. The actions mostly involved buying specific type of products. The action 'refusing plastic bags' was not answered for after GGVN. The data were not sufficient to report on a significant change between before and after. However, Fig. 16 shows that 5 actions with a high rate of intention-answers before, received a high rate of yes-answers after. Thus participants said that throughout the GGVN trainings their high intentions were turned into action. However, for the other 4

10 HIGHEST CHANGE IN YES-ANSWERS

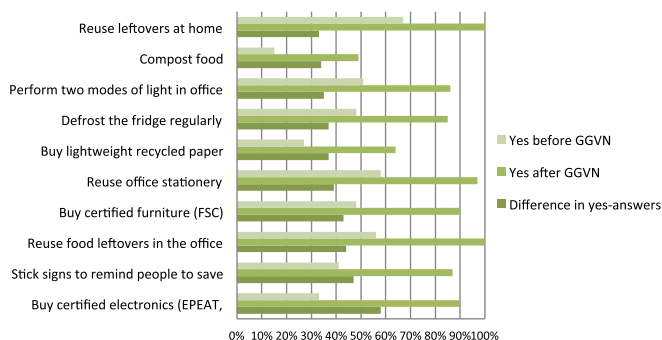


Fig. 14. The 10 actions with the most change in yes-answers, after GGVN.

10 LOWEST CHANGE IN YES-ANSWERS

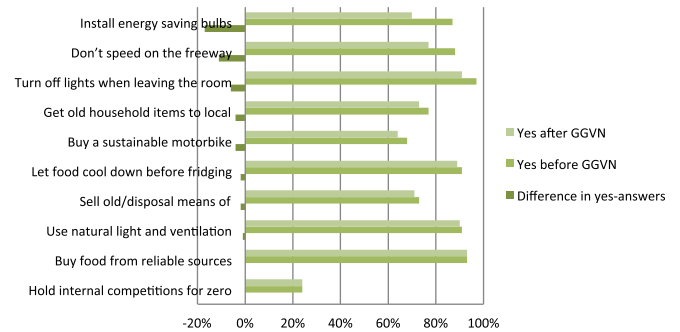


Fig. 15. The 10 actions with the least change in yes-answers, after GGVN.

actions, little or no change was shown in the yes-answers after, the high rate of intention-answers remained. These four actions were all infrequent investments, such as purchasing solar power or modern kitchen equipment. GGVN did not manage to establish a substantial change for these actions.

4.5. The monitor reports

4.5.1. Before GGVN

The monitor reports confirmed that participants had indeed applied many of the actions before GGVN. The two main reasons participants gave for joining GGVN were to know how to be healthier and save money; they expected to gain more practical tips on these two issues. Other participants joined because they were worried about pollution of their existing habitat, and wanted to improve the environment. One of the monitors reported: "Participants really want to change themselves to protect our environment, to be healthy and to save money and energy for their family, their company and our country. Moreover, they also want their family members and friends to live greener". Two additional motives for joining GGVN were networking and professional development. Participants said that "meeting, and sharing with others offers a good chance to learn about 'green living' and discuss important issues". Some also held becoming one of the first 1000 Change Agents and receiving an international certificate in high regard.

4.5.2. After GGVN

From the survey data an increase of action was seen, the monitor reports confirmed this. Participants reported that after GGVN they understood and applied more actions. Next to that, the monitors reported that after the field trips, the number of participants

HIGHEST 10 INTENTION-ANSWERS BEFORE AND AFTER

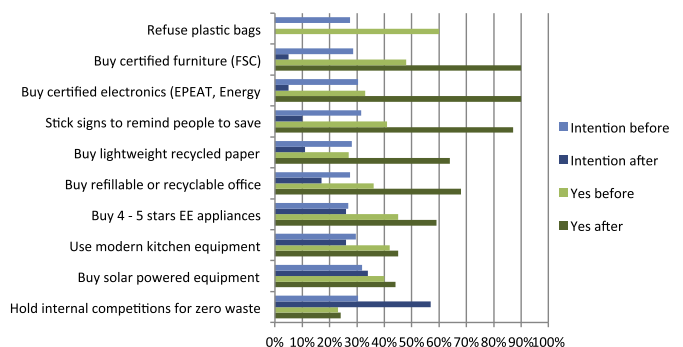


Fig. 16. The 10 actions with the highest percentage of intention-answers before and after GGVN.

completing the actions usually increased more than after information meetings. *Many tips were known before GGVN but practical implementation in participants' daily lives was missing. After GGVN one monitor wrote for example: "Regarding the fridge FIFO (First In First Out) tip, before joining the group, she divided food into many small packages and memorised the expiry date but she usually forgot it. Now, after joining GGVN, she makes a label to remember the expiry date".*

The monitor reports also showed that participants not only applied more actions after GGVN, but also felt more confident: *"At the last meeting, about 3–4 participants shared that they had applied many tips before joining the project. The project made them feel more confident and motivated to apply sustainable actions because they feel they are not alone."*

4.5.3. Popular topics: energy and the supermarket

Most groups selected the clusters 'Energy Efficiency' and 'Around the Supermarket'. These align well with the motivations for joining GGVN: saving money and being healthy. In the 'Energy Efficiency' cluster, actions to limit the use of electricity were popular before and after GGVN because it saves money. However, buying certain energy saving devices was less popular. Participants said this was because of external factors such as the lack of information, the lack of availability and the (perceived) high price. The supermarket was a topic of interest because of the relation to food and health. Before GGVN many participants applied the actions in this cluster and after GGVN even more participants did. There was one exception: buying discounted fresh food. Participants said they did not like this action because they believe freshness is the most important characteristic of good food. The reduction of plastic bags is related to this belief because participants have the habit of using plastic bags to keep food fresh. The topic was often discussed and mentioned in almost all monitor reports: *"He feels it is comfortable to buy and store food with plastic bags as sometimes he forgets to bring an environmentally-friendly bag. The vendors are willing to give him plastic bags free of charge". Or: "It is hard to keep the commitment of using just 2 plastic bags a day, especially because I am a noodle seller. I have to use at least 2 kg of plastic a day"*. This was the one action on which the survey data and the monitor reports clearly differed. The survey before GGVN showed that many participants (75%) said they only used 2 plastic bags a day. In the monitor reports it was seen though that even after GGVN, many participants still find it hard to use only 2 plastic bags a day.

The cluster 'Bathroom of the future' stood out positively from the survey before GGVN. More than for other clusters, participants reported to perform the actions already. The monitor reports also showed various stories of participants that were very careful about their water use. Often these were older participants that had this habit due to water scarcity in the past.

4.5.4. The groups

The monitor reports of the student groups showed strong motivations for sustainable consumption. Also, more often than the other groups, they included altruistic motivations: *"to make a better future for Vietnam"*. Some participants in the office colleagues groups and community groups had slightly less idealistic motives to join the GGVN program: some were assigned to participate by their bosses and some others joined for the gifts they would get (a re-usable bag, snacks and drinks). Actions that students still did not apply after GGVN were mostly those that they were not able to control (yet). This corresponds to the higher amount of intention-answers that was found from the survey data. For example, many students were not allowed to cook in their dorms and eat most of their meals in the canteen. This made them not able to control the cooking or ingredient choice as much as others could.

4.5.5. Barriers for change

After GGVN, some barriers remained. Rental or second-hand products continued to be unpopular. Participants said they did not know of any places that offered these products but also that they preferred new products. Participants also reported that the high price of environment friendly products continued to be a high barrier. However, after having received information during GGVN, participants were more convinced about the benefits of these products. Participants also complained that not enough information is provided to distinguish between sustainable and unsustainable products. On top of that, the information sources were not always trusted and participants did not know how to judge the available information. Organic food products were mentioned a lot in this category: *"It is difficult to find real organic food"*.

External factors were also mentioned as barriers, especially for the actions within the cluster 'On the road again'. Participants complained about the quality and regularity of public transport, about the absence of bike paths or the lack of safety in traffic: *"The traffic is not suitable to apply the action of 'turning off the engine at the red light'. It is better to keep the engine running to be able to avoid the other drivers, the bus and crazy vehicles."*

Two other factors also played an important role in the behavioural change process: the ease of applying an action and the time required to perform it. Participants said that easily applicable actions increased their overall motivation. Actions that participants considered easy to change were for example 'reusing leftovers', 'using the stairs instead of the elevator', 'using your own cup', 'saving paper tissue' or 'using public recycling bins'.

4.5.6. The social aspects

Another finding from the monitor reports was that many participants passed on information and encouraged others to change: *"Most of the group participants are vendors, they have a lot of relationships and are proud of talking about what they have learnt from GGVN."* or *"Mr Cường shared the message of reducing plastic to his wife."* or *"Mrs Mai usually talks with her customers on what she has learnt."* Also, a community member made re-usable shopping bags for everyone in her group; someone else started a 'grow-your-own-vegetables-course for her neighbourhood' and others came up with additional actions to be added to the list of 90 and shared these with their groups.

In contrast to that is the resistance some participants experienced from their surroundings. During GGVN, some participants were ridiculed for their actions by their spouses or children, for example for *"collecting old jars and old bottles to reuse again as flower vases"*. Also, a complaint from the office colleague groups was that their other colleagues did not support them. Some wanted to reduce electricity use by installing energy saving light bulbs or using the air-conditioning less. However, their colleagues preferred to *"use strong light and air-condition the whole day"*.

Nevertheless, GGVN made that participants did not feel alone, which strengthened their confidence. Participants tried not to be bothered by the ridicule from others: *"Mr. Duc, who used to be ashamed to bring a bowl to buy food or a cloth bag to the market, has now changed his habit although he knows some people will stare at him"* or *"Ms. Tiên, she is using a bike confidently and confirmed that she will keep using her bike to go to school or hang out, in spite of her friends' teasing."*

5. Discussion

The main objective of this study was to identify sustainable behaviour that followed or did not follow from an intervention among Vietnamese consumers. These formed the basis to develop initial directions for sustainable consumption strategies.

5.1. Limitations

There were two limitations to the method used. First, a self-reported survey captures only what participants say and not what they actually do. However, this limitation was partially compensated by the monitor reports since these included house visits and observations. Differences between the survey and monitor reports were only found for one action: the use of plastic bags. The survey showed that many participants claim to only use 2 plastic bags a day. But, in almost all monitor reports it was mentioned that participants still have trouble to minimize the use of plastic bags.

Second, as a result of the two different methods used (individual surveys before GGVN and group discussion after GGVN), only tentative conclusions can be drawn regarding behaviour change before and after the intervention. The Vietnamese project team chose to use a group procedure with the intention to share mutually achieved results and to strengthen the groups' motivations to continue. Another limitation was that the post-project survey was only conducted for the actions within two contextual clusters, and not all nine. Monitor reports are used to strengthen the conclusions regarding the change between before and after and to mitigate the limitations of the research method.

The actions were quite well adapted to the Vietnamese participants. Before GGVN, participants reported that only 6.6% of the actions were not applicable to their daily practice. The selection of highly motivated participants contributed to this. This could also explain why some actions showed little or even negative change after GGVN (ceiling effect). However, there were also actions left blank, especially in the office context clusters. On average 9.5% of the participants did not answer for the actions in these clusters, mostly because they did not work in an office, compared to 5.4% in the other clusters. The office clusters also received the lowest percentages of yes-answers. If actions left blank were treated as not applicable-answers (now it was not), the reported percentages of yes-answers in these office clusters would have been even lower.

5.2. The effect of GGVN

The survey showed that the program achieved significant positive overall change; performed actions increased from 64% to 80%. The selection of highly motivated participants, activity based group trainings and some existing sustainable habits, showed to be a good mix for change through the GGVN training program. Similar studies, e.g. on Eco-Teams, also suggest that: “change can be predicted from the interplay between behavioural intention and habitual performance before participation, and the degree of social influence experienced during participation” (Staats et al., 2004, p.341). However, this successful but complex intervention should be further decomposed in the future to find out what elements exactly cause the package to be effective. Participants with a quite high level of sustainable behaviour were selected; this made change through GGVN likely. When lower level participants would have been selected change would have been less likely but room for improvement even larger. Participants reported that certain actions were already habitual as a money saving strategy (e.g. sparse electricity use or food leftovers re-use) or due to past scarcity (e.g. sparse water use). Using Lewin's (1951) metaphor, this shows that not all old habits are ‘unfrozen’ yet. Participants reported that the GGVN trainings provided motivation to keep these sustainable habits rooted in their daily rituals and to not discard them due to increased prosperity.

The monitor reports revealed two effects of GGVN that the survey did not, proving the value of triangulation of quantitative and qualitative data. They uncovered the positive effect of the field trip meetings compared to the informational meetings and the

positive (and negative) effects of social dynamics. Participants reported feeling powerful effects of social pressure and social relief in the project: the ‘feeling of not being alone’ was an important aspect of the projects' success.

No difference between the four cities was found in this study.

5.3. A high intention-action gap for buying sustainable products

Buying actions showed the highest intention-action gap. For buying actions, compared to the using and disposal actions, less yes-answers were given after GGVN but more intention-answers both before and after GGVN. Referring back to the MOA model, the relatively high intention (*Motivation*) to buy sustainable products was moderated by (perceived) availability (*Opportunity*) and certain habits and knowledge (*Ability*). The monitor reports showed that indeed high costs of sustainable products were often mentioned as a barrier for action, as well as the lack of information and lack of offering.

Participants said they needed more information to choose the right products, especially for green electronics and sustainable food products. This corresponds with the value-oriented characteristics of the Vietnamese consumers who balance quality of product characteristics against price (KPMG, 2012; Speece and Nair, 2000; TNS, 2011; Vu et al., 2007). Matthaes (2011) also found that many Vietnamese consumers browse online for brands and their products and are the most open of all Asian consumers to receiving brand information. This openness towards brands provides an opportunity for producers to interact with their consumers; especially for Vietnamese producers, because they understand the Vietnamese consumer best. However, Vietnamese producers are more and more focused on international markets instead of local markets (Maruyama and Trung, 2007; Beresford and McFarlane, 2007).

Although participants were eager for more green information, they also reported that they do not always trust green certificates or claims made on the labels of products. Shortcomings of labelling schemes are also found in Europe (Dendler, 2014); there, selecting between the abundance of green offerings is a challenge. In Vietnam, the lack of trust in local green labels is possibly due to a general perception of local brands being inferior (TNS, 2011; Speece and Nair, 2000) in combination with the government's decreasing authority on consumers (Fforde, 2013).

5.4. Energy, food and the new generation

Participant interest was high in the actions of the clusters ‘Energy Efficiency’ and ‘Around the Supermarket’. Participants also reported that food, personal health, saving energy and saving money were motivating reasons for sustainable consumption. These more egocentric motivations are comparable to findings in other countries. For example, Zhao et al. (2014) found that urban residents of China engage in green consumer behaviour for personal (e.g. economic) reasons rather than collective (environmental) reasons. Nevertheless, the monitor reports showed that students had more altruistic motives for joining GGVN. The survey also demonstrated that students reported more sustainable intentions than the other groups. Although the literature on the intention-action gap shows that this does not necessarily mean intentions will turn into future action, it is promising. Even more so, because Vietnam has a very young population: 56% of the population is below 30, and the average age in Vietnam is just 25 years (GSO, 2012).

6. Conclusions

64% of participants self-reported to be engaged in a sustainable action before GGVN and this percentage increased to 80% after GGVN. This is a positive sign for the future of sustainable consumption in Vietnam. Especially personal health and saving money were reported to motivate participation in GGVN. In the trainings, energy and food were the most popular topics. Therefore, to embed sustainable consumption in the future lives of the Vietnamese middle class, food and health or energy and saving money seem to be powerful drivers.

Many participants reported the intention to buy sustainable products but fewer participants took action to do so. In order to turn purchase intentions into future actions, participants reported wanting more information and more product offerings. Local sustainable producers and service providers should engage with consumers to provide this information and to gain their trust.

Young and idealistic students are a key group to target because they reported high intentions and altruistic motives regarding sustainable consumption. Role models will be important for the future of sustainable consumption in Vietnam because socializing these actions can overcome participants' fear of ridicule. Along the same lines, the social aspect of the group environment and activity-based meetings of GGVN were of crucial importance of the success

of the intervention. The feeling of not being alone and instead acting together strengthened participants' will to continue and thus could contribute to lasting change in the future.

In conclusion, a powerful strategy toward more sustainable consumption in Vietnam can be to create more group-based activities around the themes of energy and shopping for food. A twofold approach is needed that both installs new sustainable consumption patterns and keeps old habits rooted in daily rituals. Role models should set an example for the young population and consumers and producers must be better connected to increase trust and transparency.

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Appendix A

Sustainable actions survey

Tick the box in front of the behaviour change

☒ = I do this
☐ = I don't do this
☐ = I intend to do this
☐ = This doesn't apply to me

3R at the Office/School

- ☐ Use stairs instead of the elevator
- ☐ Use your own cup for coffee/tea
- ☐ Give priority in buying local stationery
- ☐ Buy stationery in large quantities
- ☐ Buy lightweight recycled paper
- ☐ Buy refillable or recyclable office stationery
- ☐ Print two-sided
- ☐ Collect old paper
- ☐ Save paper tissue
- ☐ Stick signs to remind people to save electricity
- ☐ Use public recycling bins
- ☐ Collect and share recyclable office supplies
- ☐ Reuse office stationery
- ☐ Monitor what you throw away

Towards a Green Office

- ☐ Reuse food leftovers
- ☐ Use natural light and ventilation
- ☐ Perform two modes of light in office
- ☐ Use A/C and fans
- ☐ Use energy saving modes
- ☐ Maintain big electronic devices
- ☐ Buy furniture made from environmental friendly materials
- ☐ Buy certified furniture (FSC)
- ☐ Lease electronics
- ☐ Buy certified electronics (EPEAT, Energy Star)
- ☐ Hold internal competitions for zero waste

General information

Name: _____

Age: _____ years

Hometown: _____

Highest education: _____

Current occupation: _____

Marital status: _____

Household type: _____

Household size: _____ people

Household income: _____ VND/month

Introduction

☐ Refuse plastic bags

☐ Don't litter

Live Like a Farmer in the City

- ☐ Eat organic food
- ☐ Reuse leftovers
- ☐ Use rain water
- ☐ Use natural cleaning agents

Energy Efficiency

- ☐ Limit using electricity at high peak time
- ☐ Unplug devices
- ☐ Combine A/C with fan
- ☐ Put A/C at 26°C
- ☐ Use natural light and ventilation
- ☐ Have green plants in your house
- ☐ Turn off lights when leaving the room
- ☐ Clean bulbs frequently
- ☐ Install energy saving bulbs
- ☐ Insulate at windows and doors
- ☐ Maintain big electronic devices
- ☐ Rent or borrow products
- ☐ Buy second hand items
- ☐ Buy 4 - 5 stars EE appliances
- ☐ Buy solar powered equipment

Bathroom of the Future

- ☐ Take short showers
- ☐ Use a water saving shower head
- ☐ Turn off the tap when not in use
- ☐ Use natural cleaning agents
- ☐ Use cloth tissues

Kitchen of the Future

- ☐ Position fridge 10cm from the wall
- ☐ Set fridge at 7°C, and freezer at -18°C
- ☐ Defrost the fridge regularly
- ☐ Store food according to directions on label
- ☐ Load your fridge up between 70 and 80%
- ☐ Apply First In First Out
- ☐ Plan cooking in detail
- ☐ Defrost food before cooking
- ☐ Let food cool down before fridging
- ☐ Use modern kitchen equipment
- ☐ Use the lid
- ☐ Prioritize using a microwave
- ☐ Compost food
- ☐ Monitor what you throw away

Home Recycling Station

- ☐ Don't burn waste
- ☐ Use a recycling station
- ☐ Monitor what you throw away
- ☐ Reuse packaging
- ☐ Get old household items to local charities

In and Around the Supermarket

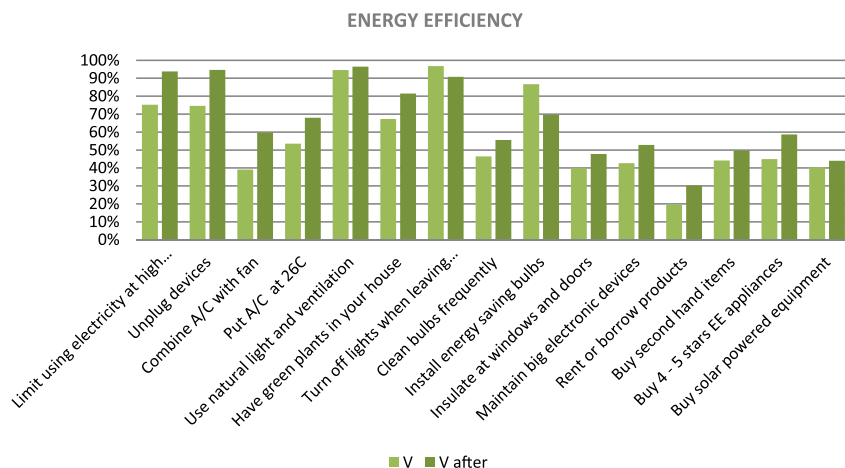
- ☐ Make a shopping list
- ☐ Buy diverse food
- ☐ Buy food in season
- ☐ Prioritize to buy local food
- ☐ Buy food from reliable sources
- ☐ Prioritize environmental friendly packaging
- ☐ Buy discounted fresh food

On the Road Again

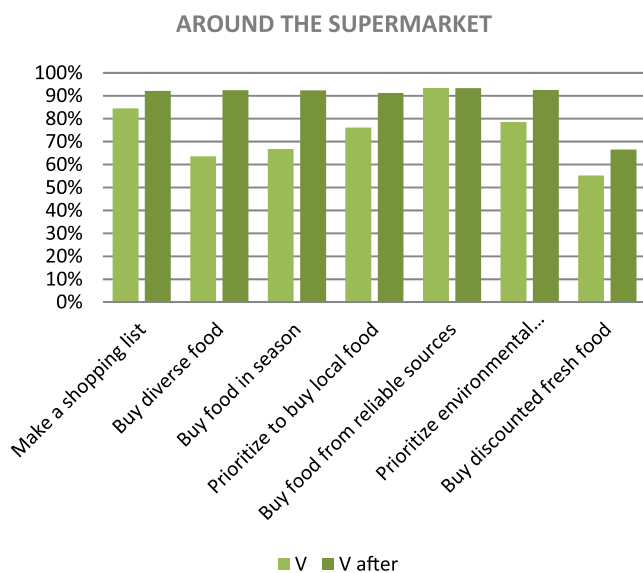
- ☐ Turn off your engine while idling
- ☐ Maintain your motorbike
- ☐ Buy a durable helmet
- ☐ Keep speed consistent
- ☐ Don't speed on the freeway
- ☐ Accelerate and brake smoothly
- ☐ Avoid traffic jams
- ☐ Share your motorbike
- ☐ Buy a sustainable motorbike
- ☐ Use public transportation
- ☐ Use a bicycle
- ☐ Use a car
- ☐ Sell old/disposal means of transportation

Appendix B

APPENDIX B1: Yes-answers before and after, for the cluster 'Energy Efficiency'.



APPENDIX B2: Yes-answers before and after, for the cluster 'Around the Supermarket'.



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