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# Going Green and Staying Sustainable: Community Based Tree-Planting Projects in Mongolia

Rachel Klassen

*SIT Study Abroad*, [rachelklassen@comcast.net](mailto:rachelklassen@comcast.net)

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# Going Green and Staying Sustainable: Community Based Tree-Planting Projects in Mongolia

Klassen, Rachel

S. Ulziijargal  
Ahearn, Ariell  
Humboldt State University  
Environmental Science - Ecological Restoration  
Mongolia: *Ulaanbaatar, Dornogovi Aimag, and Uvurkhangai Aimag*  
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**Abstract**

*Community* based tree planting projects are abundant in Mongolia and have become a popular form of social movement towards promoting a healthy environment. With so many different varieties of tree planting projects in Mongolia, it is necessary to evaluate how well the different forms of *Community*-based tree planting projects function. The first research question created to assess said *Community* projects is, are *Community* based tree planting projects environmentally sustainable? And the second, are *Community*-based tree planting projects in Mongolia sustainable from an organizational standpoint? To answer these questions interviews, surveys and case studies were given in the three study sites of *Ulaanbaatar*, *Dornogovi aimag*, and *Uvurkhangai aimag*.

The results of the study showed that water resources and sustainable support in the forms of volunteers and funding were the largest sustainability problems faced by *Community* based tree-planting projects as a whole. In conclusion an ideal model for future *Community* based tree-planting projects was made. The model identifies five key steps that are recommended as the best approaches for creating a project based on observed success of the case studies. The ideal model goes as follows: 1) Use of local volunteers or schools, 2) Raise Environmental Awareness, Education, and Appreciation of Nature 3) Advertise 4) Create events, and 5) Offer Benefits.

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**List of Terms**

1. *Aimag*- A province of Mongolia. Functions similar to a state in the U.S.A.  
There are 21 *aimags* in Mongolia
2. *Community*- a particular group of people who live or work within a common area.
3. *Dornogovi Aimag*- *Aimag* in southeastern quarter of Mongolia, located within the Gobi desert.
4. *Hamriin Hiid*- a place of spiritual significance located
5. *Sainshand*- The central city of *Dornogovi aimag*.
6. *Sum*- administrative districts within an *aimag*, similar to counties in the U.S.A.
7. *Taragt*- *Sum* in *Uvurkhangai aimag*. One of the sites of the Onggi river movement.
8. *Tsonjin Boldog* –a region located about 55km from *Ulaanbaatar*, that houses the famous equestrian statue of Chinggis Khan.
9. *Ulaanbaatar*- Capital city of Mongolia, the most populated area of Mongolia, located within *Tov aimag*, though not under *Tov aimag*'s administration. The rapid growth of the city has caused numerous concerns in terms of both human and environmental health.
10. *Uvurkhangai Aimag*- *Aimag* in central southern location of Mongolia, I
11. *Zud*- A Mongolian term for an extremely snowy and stormy weather.

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## **Introduction**

“It is hard to change with one person, [it is] better to collaborate with others”, said a volunteer on Mongolia’s national day of tree planting. In recent years *Community* based tree planting projects have taken a hold over Mongolia. With numerous groups joining the movement, it is time to look into how well these groups function and if their practices are both environmentally and organizationally sustainable.

Environmental issues have become a growing concern around the world. Such problems as global climate change have been brought to the public eye and have inspired people around the world to take action. In some countries such as India, over 2000 eco-clubs have been established in schools and universities. (In Mongolia citizens have begun to do the very same. Problems such as desertification and pollution are commonly discussed issues in the country and are the two most identified environmental issues in Mongolia, as seen from the researchers survey results. Some environmental organizations have decided to address these problems through the creation of restoration and mitigation projects. Many of these projects have decided to take on a *Community* or volunteer based format. While each organization sets their own goals and addresses these goals with different approaches, each program hopes to better the environment in some way. It can be said that in Mongolia, one of the most easily accessible examples of *Community* based environmental projects, is those focused on tree planting. Walking down the streets of the capital city *Ulaanbaatar* in the spring, one can see city labor workers carrying saplings across the busy intersections to an adjacent greenbelt. Tree planting efforts have even become a part of the presidential agenda in Mongolia. In May 2010 President Elbegdorj announced the creation of two national days of tree planting (President). In addition, in 2005 a nation wide project titled ‘Green Wall’ was created to help reduce desertification of Mongolia through the planting of trees (World Bank, 2006).

## **Study Site Ecological Profiles**

Mongolia is a land locked country centrally located between Russia and China and has a total area of 156.5 million ha (Batkishig). Within



Mongolia's territory there are three key categories of ecological zones: forest, steppe, and desert. Case studies on desert and steppe regions will be analyzed in the work. Though not an ecological zone, urban areas will also be analyzed because of the strong influence cities can have on the environment.

One of the most prominent ecological zones in Mongolia is the desert. The Gobi Desert stretches from the east to west most borders of the country, and covers the southern half of Mongolia. While the region is typically very dry, the desert often has seven inches of precipitation in one year. Because of Mongolia's high altitude, the Gobi can frequently receive its precipitation in the form of snow. The Gobi is also not as sandy as most envision a desert. The Gobi has little vegetation except for sparsely occurring shrubs and small trees (Gobi Desert, 2010). In the study, the first study sites visited during the research were *Sainshand* and *Hamriin Hiid* of *Dornogovi aimag*, located in the east Gobi.

The second study site visited was *Taragt Sum* in *Uvurkhangai aimag*. *Taragt Sum* is located within the Mongolian steppe and is one of the most iconic natural aspects of Mongolia. The steppe is one of the regions that many of Mongolia's nomadic herders call home, and raise livestock. The Mongolian steppe crosses the full length of the country, but is concentrated in the northern half of Mongolia. The steppe is typically grassy with sparse trees, which cover rolling hills, and plains (Eastern Steppe Mongolia).

The third study site is *Ulaanbaatar* the capital city of Mongolia. Though urban areas or not a biological category of land, it is important that Mongolia address the environmental challenges that cities such as *Ulaanbaatar* are experiencing. Cities in Mongolia are typically small from a western viewpoint, though they are the most highly populated areas known to Mongolia. Cities have minimal skyscrapers, paved roads, and sedentary houses. Most cities have a central main road that runs completely through them. Just beyond the cities sedentary buildings, surrounding ger districts can be found. These districts typically are not

connected to infrastructure such as roads, running water, or electricity (Ganbold, 2013).

### Mongolia's Environmental Problems

Mongolia is currently facing a multitude of environmental problems; including land degradation, desertification, deforestation, a decline of water resources, loss of biodiversity, air pollution, and frequent natural disasters (Northeast Asia Economic Forum, 2007). The severity of each of these issues may vary in each geographic region of Mongolia, yet most regions of Mongolia have been affected by at least one of these problems. This paper will primarily focus on the issues of desertification, and water resources, as the researcher has found them to harbor the most relevance to tree planting efforts.

One of the main problems that tree planting organizations aim to combat is desertification. Desertification is the loss of ecological productivity of habitats in arid regions (Imeson, 2012). Desertification is an issue of great concern because of the potential for lands that were not previously desert to become more arid. Desertification has affected around 90% of Mongolia's land, and by its nature is expected to spread (Northeast Asia Economic Forum, 2007). In controlled experiments a desertification model was shown to reduce the frequency of precipitation (Varejã O-Silva, 1998). The decrease in precipitation contributes to the second environmental issue, water availability.

In addition to the general decrease of precipitation, activities such as mining negatively influence the availability of clean water. Mining uses copious amounts of water to extract minerals and coal. The waste water that is discharged typically contains heavy metals that can be harmful to human and ecological health (Tiwary, 2001). In some extreme cases river and lake levels have depleted or dried up due to mines overusing water resources (Tungalag, 2008). It is for these reasons that ecological restoration is needed in Mongolia.

### Tree Planting as a form of Restoration

With awareness of environmental issues on the rise, innovations in the realm of rehabilitation of damaged lands are being created. As previously mentioned, tree planting projects have become a popular form of ecological

restoration. In the case of Mongolia, tree planting has been identified as a way to better the currently harsh environmental conditions. The two main environmental concerns that many Mongolia tree-planting groups aim to resolve are desertification and the ecological side effects of mining. In recent years a focus on the government agenda has shifted towards focusing on conservation. In this encouragement over tree planting as a form of windbreaker and sand stabilizer has been implemented in many areas. These tactics are focused primarily on decreasing the effects of desertification (World Bank, 2006). In addition, tree planting, as a means of mine restoration, was found that trees planted in post mining areas were able to grow successfully and were capable of restoring an area of degraded soil (Szarek-Lukaszewska, 2009). Given the potential for tree planting as a method of restoration in Mongolia, factors such as social awareness and support must be examined.

### Community

One of the most important factors in the sustainability of *Community* based projects, is the way that *Community* members become involved and how they work together once involved. It is important to keep in mind that the concept of *Community* is often fluid or dynamic. Conceptualizations and understanding of *Community* are different depending on social context and may not be constant from country to country (Leach, 1999).

In an interview conducted at the Zorig foundation, with Mr. Badruun the concepts of *Community* in Mongolia were discussed. At the start of the discussion on *Community*, Badruun stated, “The word *Community* does not exist in Mongolian”. Later he went on to elaborate that, “No word really covers the physical and social space that ‘*Community*’ is supposed to”. It was then discussed that because *Community* is a relatively new concept in Mongolia, not everyone understands the premise and there is a potential for difficulties when organizing social groups (Badruun, 2013)

In addition to the differences in mentality of *Community*, there are different forms of motivation. Studies conducted on motivation within a workspace, have found a inverse relationship between motivation levels and managerial levels. Workers from a lower level were found to have a higher

level of motivation in the work space that did workers of higher positions (Deal, 2013). The same motivating force observed in lower level workers can be said about citizens. When thinking outside of the workspace, citizens would generally be classified as a lower level than say government officials, this idea entertains the possibility that motivation would best be gathered from a ground up approach when enacting projects.

In the wake of the twenty-first century, online resources have enabled greater communication, which has become a basis for advertising of social movements. The creation of the Internet has opened all new portals and connections to people around the world. Online social networks such as Facebook have taken communication even further by creating virtual online communities. The structure of Facebook has fostered a *Community* sensation in the forms of adding friends, 'liking' pages, and joining groups. Social media pages have become one of the most easily accessible forms of communication and have in turn, become a way of advertising and promoting social movements. Five out of the six groups that will be discussed later in the study have Facebook pages that they use as a means of advertisement and contact forum.

### Combating Environmental Problems with *Community* Tree Planting

The natural ability for trees to mitigate the harsh effects of mining, water loss, and desertification, coupled with the prosperity of *Community* involvement, is what makes *Community* based tree planting projects a simple yet appropriate technique for tackling the environmental problems of Mongolia.

Through the study sites of *Ulaanbaatar*, *Dornogovi aimag*, and *Uvurkhangai aimag*, the researcher has pursued two research questions. The first being, are *Community* based tree planting projects environmentally sustainable? The second, are *Community*-based tree planting projects in Mongolia sustainable from an organizational standpoint? These two questions will be addressed through case studies, interviews, and surveys conducted throughout the research.

## **Methodology**

The main methods used for gathering data and information were surveys and interviews given in *Ulaanbaatar*, *Dornogovi*, and *Uvurkhangai*. For each interview, the interviewee was asked to sign a consent form acknowledging the purpose of the study and giving permission to be recorded with an audio recorder, and use their name in the study. Surveys were handed out to people in public areas and were free to decline from the study by giving back a blank survey. No specific gender was targeted during the surveying and interviewing process. Only people over the age of eighteen were allowed to partake in the research. In the study one general survey (Appendix 2.1 and 2.2) was used for all locations of study. No alterations were made to these questions throughout the study. An additional My Club survey (Appendix 1.1 and 1.2) was created specifically for the My Club tree-planting event. The My Club survey did not receive any alterations and was used only for the My Club event. Questions asked in the surveys were originally written in English and later translated to and given in Mongolian. Three translators were used through the duration of my study. Translator 1 translated all survey questions from English to Mongolian and all answers from Mongolian to English.

The first week of the study was spent in *Ulaanbaatar*. Four interviews took place directly in the city. Two of the interviews did not require a translator, while the other two required the help of Translator 1. Only one of these interviews was not recorded. The last day of the week was spent at the My Club tree-planting event hosted in the area of *Tsonjin Boldog*. A specific survey was created for the My Club participants, as they were already involved in a tree-planting event, and so some questions that were given in the general survey were not used, while other questions regarding their activities with My Club were added.

Five days were spent in *Dornogovi aimag*. Six interviews were conducted in the town of *Sainshand*, and two interviews were conducted at *Hamriin Hiid*. The two interviews at *Hamriin Hiid* were not recorded because of poor sound quality due to high winds. Some interviews were conducted in two parts because of the availability of interviewees. Most interviews were within 30 to 45 minutes, though some lasted over an hour due to a 'tour' format. Thirty general surveys were given out along the main street of

*Sainshand*. Translator 2 helped hand out surveys and translated all interviews in *Dornogovi*.

One day was spent in *Ulaanbaatar* after returning from *Dornogovi*. One interview with a government official was completed. Due to the unavailability of Translator 1, Translator 3 translated this single interview.

After one day in *Ulaanbaatar*, five days were spent in *Uvurkhangai* and *Taragt Sum*. All interviews were given within the *Community* of rural families living in *Taragt*. These families were asked questions more specifically related to the Onggi River Movement and their involvement with the project. Each interview ran for 10 to 30 minutes. The general survey was handed out to people in the *Uvurkhangai aimag* center at public places including the black market and the entrance of a hospital. Translator 1 was used for translating all interviews and helped distribute the general survey.

The remaining days were spent in *Ulaanbaatar*. Thirty general surveys were collected outside of the state department store and circus of *Ulaanbaatar*. Three interviews were conducted in the last week of research. Translator 1 was used for the giving of surveys and the translation of one interview.

Some general limitations were faced during the study. One limitation was the personal health of the researcher. Though no day was wasted, the efficiency and the amount of work that could be accomplished was limited. The amount of time spent traveling created scheduling obstacles and often was not able to be utilized as working time. The traveling time also made it difficult to see what survey questions were being understood and answered properly. The lack of time to review each set of surveys caused by traveling schedules left no time for the altering of survey questions. While the researcher had a schedule to keep, so did the translators. The availability of translators caused limitations on the amount of interviews that were able to be accomplished in the research time. One limitation that was present during interviews in *Uvurkhangai*, was that in order to travel from ger to ger, at least one member of the host family had to drive the researcher to each interview, and was present during said. One of the questions that the researcher intended to ask was, how effective do you think the Onggi River Movement has been at achieving their goals? The researcher was unable to ask such a question

because of the host family’s large involvement in the movement. The question could have made some interviewees uneasy and it was likely that truthful answers would not have been given. The presence of host family members may have also hindered some of the other answers given.

Overall, the biggest obstacles were those related to communication and language barriers between translators and the researcher. Every person has his or her own vocabulary preferences, and limitations and translators are no exception to this. The use of multiple translators meant discrepancies in some translations, and meant the use of varying terminology for a common meaning. Each translator had a different level of proficiency in English, and may have been at different levels in Mongolian as well.

**Data and Results**

**My Club:**

Survey

In the My Club survey, nine questions were asked. Four of these questions asked the survey taker to choose: yes, no, or other; while five allowed for more open-ended responses or multiple answers. Thirty surveys were given out during the My Club tree-planting event.

My Club survey question #1 asked the age of the participant. All participants in the survey gave ages between 18 and 32. Six of the participants were 20 years old, making it the mode age of survey takers.

My Club survey question #2 asked the survey takers their reasons for attending the My Club tree-planting event. Five genres of answers were given in response to this question. (Table 1)

**Table 1 - My Club Responses: Reasons for Participation**

| <b>Reason for Participation:</b> | Personal Interest* | Member of Group** | Major *** | Greener Environment **** | Citizens’ Responsibility ***** |
|----------------------------------|--------------------|-------------------|-----------|--------------------------|--------------------------------|
| <b>Number of Responses:</b>      | 7                  | 5                 | 2         | 10                       | 5                              |

\*Responses related to personal interest, satisfaction, and general interest in helping.

\*\* Responses related to attending with others of a social group such as: colleagues, classmates, friends, or My Club members.

\*\*\* Responses that claimed that tree planting was related to their academic major.

\*\*\*\* Responses that showed a desire to: help the environment, for the good of the planet, or to promote a greener environment.

\*\*\*\*\* Responses related to fulfilling one’s duty, and taking responsibility

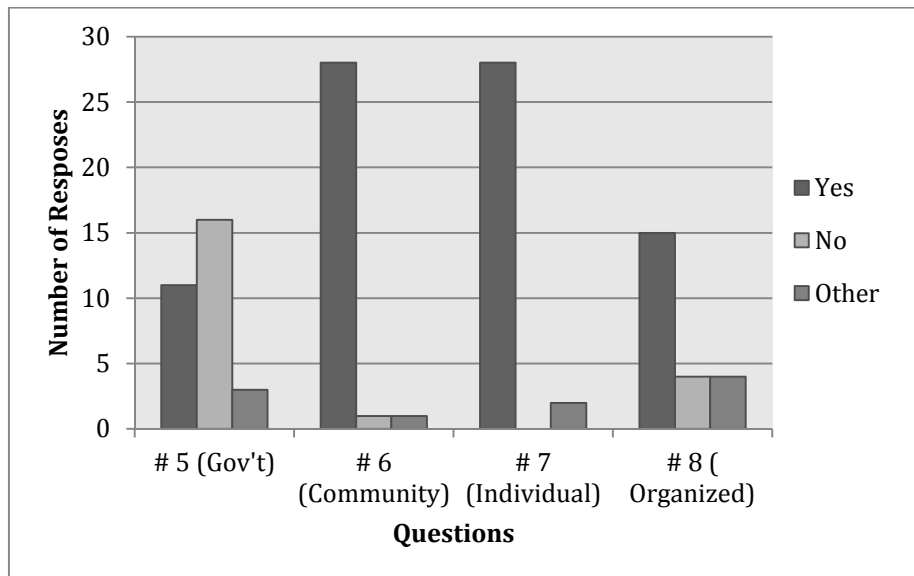
The most popular response for joining, with 10 people listing this answer, was to promote a greener or healthier environment. The second most popular response was for reasons of personal interest, with 7 responses. The least common reason for joining was responses related to academic majors, with only 2 people giving the response.

Question #3 and #4 are analyzed in the “**Comparisons**” section of Data and Results. Questions #5-#8 are the four questions giving the options of yes, no, and other. (Table 2)

**Table 2 -My Club Survey Results**

| Question:        | Yes | No | Other | No Answer |
|------------------|-----|----|-------|-----------|
| # 5 (Gov't)      | 11  | 16 | 3     | 0         |
| # 6 (Community)  | 28  | 1  | 1     | 0         |
| # 7 (Individual) | 28  | 0  | 2     | 0         |
| # 8 (Organized)  | 15  | 4  | 4     | 7         |

**Figure 1 - My Club Survey Results**



Question #5 asked participants if they trust government to protect the environment. This question received the widest spectrum of answers, and received more evenly distributed answers than other questions #6-#8. (See Figure 1) Most participants responded, No. Of those who answered No, none elaborated on their answer. Of those who answered yes, 1 survey elaborated that “if there are the right people, with the right intentions”. Of those who answered other, 3 elaborated giving the responses, “There should be more



clubs supporting the environment and rehabilitation, and government should support them”, “to co-work with citizens and follow the law”, and “maybe”. (Figure 1)

Question #6, asked if the survey taker felt a more connected, or felt as if they were a part of a *Community* because of the event received almost only yes responses. No surveys elaborated on the chosen answers. (Figure 1)

Question #7 asked if the survey taker if an individual could make a positive change, or have an impact on the environment. A majority answered yes. 1 person elaborated to say, “Every person’s mentality”. 2 surveys responded other, giving the explanations, “maybe”, and “it is hard to change with one person, [it is] better to collaborate with others”. (Figure 1)

Question #8 asked survey takers if they thought the My Club event was well organized. Half of survey takers responded yes. In the surveys that elaborated on the answer yes, most used sentences or phrases using words such as probably, think, sort-of, and in general to elaborate on their answer yes. Of those who answered other, 1 survey elaborated, “Mediocre, the societies involvement is poor”. (Figure 1)

Question #9 asked survey takers to suggest improvements for the My Club event. Of the 30 surveys, 18 surveys did not have responses or had unclear answers. The 12 surveys that had clear answers had four main themes, and one outlier. 3 surveys mentioned a greater need for an influence on mentality, and motivation. 3 surveys suggested to have more young people involved in the future. 3 surveys recommended that the government should give funding or financial support. 2 surveys suggested more frequent monitoring or the creation of new projects related to maintenance. The last survey suggested, “to involve more jobless people”.

### Interviews

No formal interviews were given at the My Club tree-planting event.

### ***Dornogovi:***

#### Survey

General survey question #1 asked the age of the participant. All participants in the survey gave ages between 20 and 62. Of the survey

participants, 9 out of the 30 were in their 30s making them the largest age group in the *Dornogovi* survey.

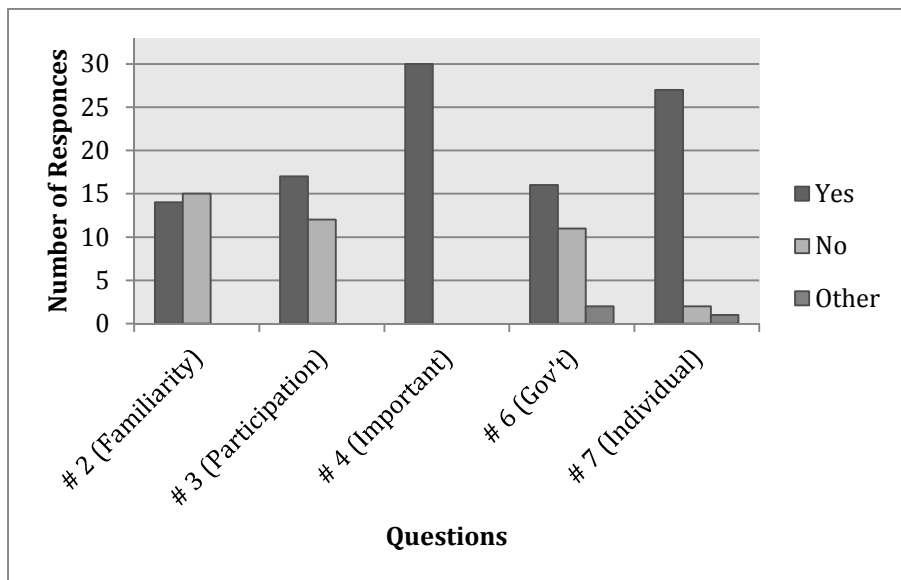
Questions #2, #3 in the general survey allowed survey takers the choices: yes, or no. Questions #4, #6, #7 in the general survey were giving the options: yes, no, or other. (See Table 3) Survey question #5 results will be discussed in the **Comparisons** section. (Table 6)

**Table 3 - *Dornogovi* General Survey Results**

| Question:           | Yes | No | Other | No Answer |
|---------------------|-----|----|-------|-----------|
| # 2 (Familiarity)   | 14  | 15 | N/A   | 1         |
| # 3 (Participation) | 17  | 12 | N/A   | 1         |
| # 4 (Important)     | 30  | 0  | 0     | 0         |
| # 6 (Gov't)         | 16  | 11 | 2     | 1         |
| # 7 (Individual)    | 27  | 2  | 1     | 0         |

Question #2 asked the survey taker if they have ever heard of tree planting groups such as My Club or the Onggi River Movement. The results were almost evenly split with 14 (46.7%) of surveys showed a familiarity with tree planting projects while 15 (50%) of surveys showed unfamiliarity with such programs. (Figure 2)

**Figure 2 - *Dornogovi* General Survey Results**



Question #3 asked if survey takers had ever participated in a tree-planting project before. Though fairly evenly split, 5 more people had participated than had not, making a marginal majority of 56.7%.

Question #4 asked about the importance of tree planting. 100% of surveys answered yes, it is important to plant trees. (Figure 2)

Question #6 asked about whether or not the government could be trusted to take care of environmental issues. A majority (53.3%) of surveys answered yes, while a 36.7% said no, and 6.67% said other. The 2 other responses elaborated that, “[they] talk a lot but do not do much”, and “Government can not solve problems, everyone should participate and be involved”. (Figure 2)

Question #7 asked if an individual could positively change the environment. An overwhelming majority of 90% answered yes. Of those who answered yes, 1 survey elaborated by saying that, “If people will collaborate with clubs to make the environment greener and will succeed in that, then other people will collaborate as well”. (Figure 2)

### Interviews

Eight interviews total were hosted in *Dornogovi*, while three interviews will be analyzed. These three interviews were conducted with, one teacher from *Sainshand* Secondary School #1, one lama from *Hamriin Hiid*, and one groundskeeper for *Hamriin Hiid*.

Dolgormaa Borkhun is a biology teacher at secondary school #1 in *Sainshand*, and is in charge of overseeing the school’s eco-club. The main goals for the creation of the eco-club were to get through to children and to get the children to work with nature. The club’s main goal is to promote green development and encourage support of eco-projects. She went on to say that it is important to teach children about nature because it encourages the students to take initiative and practice good working skills while working towards a healthy environment. The club and its members have received numerous awards for their work, and so she considers these to be the largest success the club has had. Though she claims that they have not had any big problems, small issues in regards to finding finances and water are present. All water is paid for by the school budget. The children plant seven or eight kinds of trees that are native or grow well in the Gobi. During the academic year students take care of the trees and collect their seeds, while during the *Summer* groundskeepers care for the trees.

The two interviews conducted for *Hamriin Hiid* were with the lama Buyantogtokh, and the groundskeeper, Batsaikhan. The interview with Buyantogtokh was conducted in a formal format, while the interview with Batsaikhan was hosted in a tour format. Buyantogtokh stated that the main goals for *Hamriin Hiid*'s tree planting are to improve the environment, keep nature clean, and improve people's health. He continued to say that the trees of the program are planted mostly by two men who received education from an outside source. One of these men is Batsaikhan, who elaborated that it was *Ulaanbaatar* agriculture teachers who taught him tree-planting methods. Though Batsaikhan plants and cares for the trees year round, Japanese tourists come once a year to volunteer their time to plant trees at *Hamriin Hiid*. The trees are typically planted close to wells because the close proximity makes it easy to access to water. No pesticides are used and only natural fertilizers such as bird droppings are used. When asked about the projects successes, Buyantogtokh claimed that there have not yet been any large successes. When talking about the biggest difficulties faced, he said that financial support and water were the biggest, while when talking with Batsaikhan he stated that keeping animals from eating the plants and finding non-salt water were the biggest problems.

### ***Uvurkhangai:***

#### Survey

The general survey was used for analyzing *Uvurkhangai*. 30 surveys were given out Question #1, asking the age of survey takers showed that the age ranged between 23 and 68. Though 9 surveys left this question unanswered, 21 people gave their age. The most common age group was people in their 50s (6 surveys).

Questions #2, #3 in the general survey allowed survey takers the choices: yes, or no. Questions #4, #6, #7 in the general survey were giving the options: yes, no, or other. (See Table 4) Survey question #5 results will be discussed in the **Comparisons** section. (Table 6)

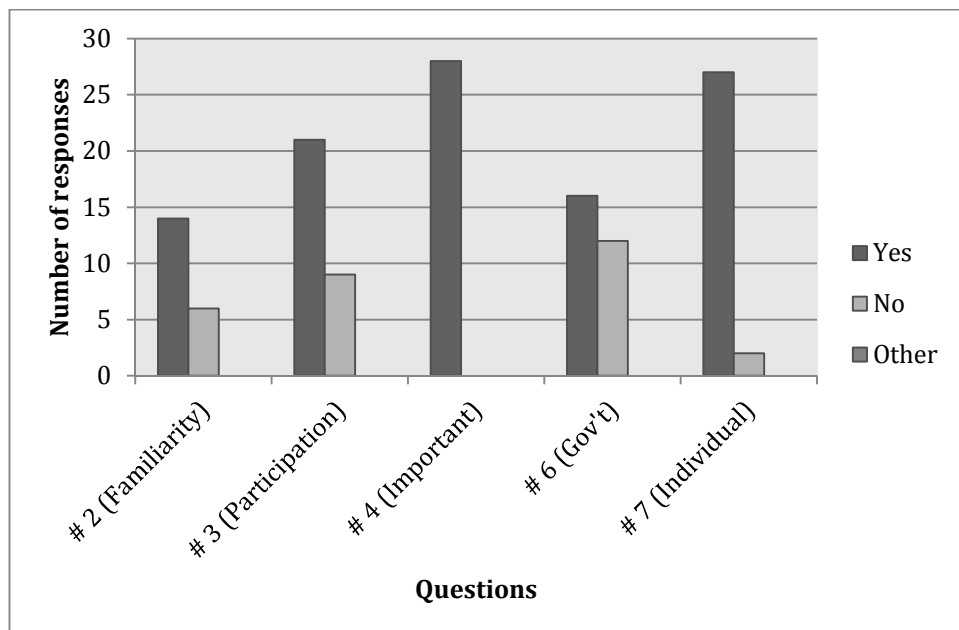
**Table 4 - Uvurkhangai General Survey Results**

| Question:           | Yes | No | Other | No Answer |
|---------------------|-----|----|-------|-----------|
| # 2 (Familiarity)   | 14  | 6  | N/A   | 0         |
| # 3 (Participation) | 21  | 9  | N/A   | 0         |
| # 4 (Important)     | 28  | 0  | 0     | 2         |
| # 6 (Gov't)         | 16  | 12 | 0     | 2         |
| # 7 (Individual)    | 27  | 2  | 0     | 1         |

The general survey was used for analyzing *Ulaanbaatar*. 30 surveys were given out. Question #1, asking the age of survey takers showed that the age ranged between 18 and 63. 11 of the surveys gave ages in the 20s, making the 20s the most surveyed age group in the *Ulaanbaatar* survey.

Question #2 asked the survey taker if they have ever heard of tree planting groups such as My Club or the Onggi River Movement. A majority, 46.7%, of responses claimed familiarity. 20% of surveys showed no familiarity with such projects. (Figure 3)

**Figure 3 - Uvurkhangai General Survey Results**



Question #3 asked if survey takers had ever participated in a tree-planting project before. A high majority (70%) had participated before. 30% of survey takers responded that they had never taken part in one of these projects. (Figure 3)

Question #4 asked if planting trees is important. Of those who answered, 100% answered yes, tree planting is important. (Figure 3)

Question #6 asked about whether or not the government could be trusted to take care of environmental issues. A small majority (53.3%) of responses claimed to trust the government, while 40% said they did not. Of those who elaborated on their answers for trusting the government, one stated, “They will protect the environment, while a second said, “the government and patriotism cares for its folks”. One survey that responded no, elaborated to say that, “I do not see anything that they were talking [about] before”. (Figure 3)

Question #7 asked if an individual could positively change the environment. A large majority (90%) of responses said that, yes, they can make a difference as an individual. Only 6.67% of responses said no they did not think so. One survey that answered yes, elaborated by saying, “If everyone tries”. A single elaboration for answering no explained, “one person can’t change”. (Figure 3)

### Interviews

Nine interviews were given in *Uvurkhangai*. All interviews will be analyzed. Five interviews were conducted with families who have, will, or plan to participate in tree planting for the Onggi river movement. Four interviews were conducted with families who are not participating in the tree-planting program. Upon returning to *Ulaanbaatar* an interview with the executive director of the Onggi River movement was given. This interview can be found in the *Ulaanbaatar* Interview section.

The first questions used in the *Uvurkhangai* interviews asked if the interviewee had or as been participating in the movement and why they did or did not decide to join. Out of the 5 that had claimed participation or future participation, one said they had been participating for over three years and joined because they wanted berries, and they saw the head tree planting family doing it. One said they were interested in expanding their vegetable garden to include sea buckthorn trees, would like to make the fields greener, and that they are not looking for profit. One person said they experimented by helping another family with tree planting the previous year and now would like to try to plant their own trees this year. One interviewee had planted trees the previous year because they wanted to collect berries. The last interviewee was the head tree planter of the *Community*, Oyuna, to which she responded that

she had been participating for 10 years and started because, “[the] Onggi dried up, we had no water, and desertification was spreading. So we decided to plant trees to support the river, to support vegetation”. The four interviews who responded that they do not plant trees each claimed they did not have enough people in their family to help out, or that they did not have enough time because of their livestock.

When the five tree planting participants were asked about support in the forms of education and finances, most people said they received education from the head tree planting family. When asking Oyuna, the head tree-planter of the *Community* about her education, she claimed said that she learned from the help of the Onggi river movement and her own formal education. Oyuna says that she shares her knowledge with anyone interested in helping, and does not charge for the information. One interviewee said that they had originally received an education from a different tree planting program but no longer participated in that group's project. All families that have been currently planting trees with the Onggi river movement received starter trees donated by the movement. One interviewee claimed that after three years families would stop receiving trees from the movement. One informant stated that 30% the funds generated by the trees' berries must be given back to the Onggi River Movement. These funds will be spent by the movement towards the purchasing of future trees to be given to new families. One interviewee stated that in order to buy fences they applied for loans from the bank. When asked about financial help Oyuna replied that in addition to the trees provided by the Onggi River Movement, “the NGO “Avzaga Devjee” which [is] located in UB helped financially to build a fence so we planted another 1 hectare. Another 5 hectare of fence the *Sum*'s authorities build for us”.

Families who have participated in tree planting were asked what their biggest success so far had been. These families responded that it was too early to tell, or that they have not had a success yet because they have not yet because their berries have not developed yet. Oyuna responded that once they were able to collect over one ton of berries.

The families were then asked about the biggest difficulties they have faced. One interviewee responded that the lack of water was hard, one said getting enough financial support and funding, and one said there was no major

difficulties accept digging holes for the trees. Oyuna stated that most difficulties were caused by nature and that the initial lack of water was the biggest difficulty.

All interview subjects were asked what they thought the biggest environmental problem in Mongolia was. All but one response was related to water. The problems discussed were drought, the drying of the river, a general lack of water, and lack of water caused my mining. Two of these interviews also mentioned mining and desertification. One interviewee said desertification was the biggest problem. When Oyuna was asked her opinion, she responded, “Besides [the] country’s environmental problems, there are also global warming problems. So drought is becoming common. Also humans cause many environmental problems by mining. Mining brings many water problems.”

***Ulaanbaatar***

Survey

Questions #2, #3 in the general survey allowed survey takers the survey takers to answer: yes, or no. Questions #4, #6, #7 in the general survey were giving the options: yes, no, or other. (See Table 5) Survey question #5 results will be discussed in the **Comparisons** section. (Table 6)

**Table 5 - Ulaanbaatar General Survey Results**

| <b>Question:</b>    | <b>Yes</b> | <b>No</b> | <b>Other</b> | <b>No Answer</b> |
|---------------------|------------|-----------|--------------|------------------|
| # 2 (Familiarity)   | 16         | 12        | N/A          | 2                |
| # 3 (Participation) | 17         | 12        | N/A          | 1                |
| # 4 (Importance)    | 29         | 1         | 0            | 0                |
| # 6 (Gov't)         | 13         | 16        | 1            | 0                |
| # 7 (Individual)    | 23         | 5         | 1            | 1                |

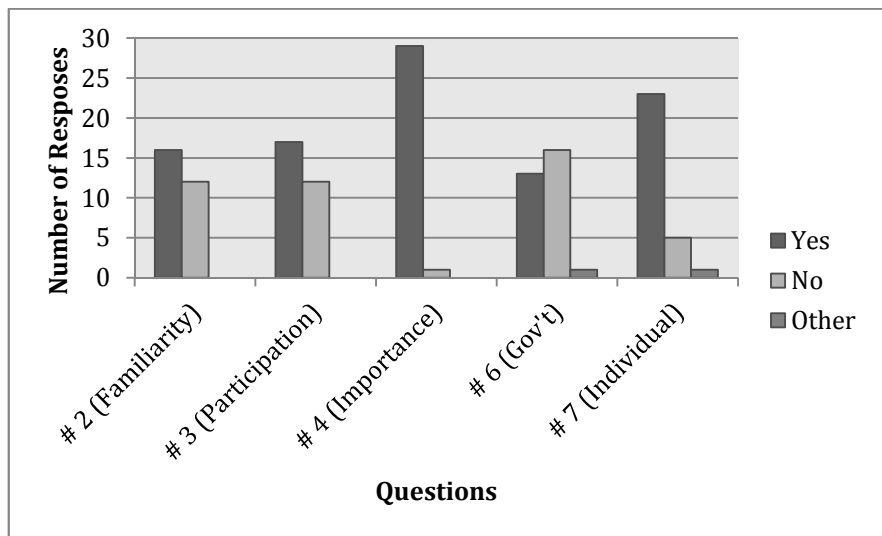
The general survey was used for analyzing *Ulaanbaatar*. 30 surveys were given out. Question #1, asking the age of survey takers showed that the age ranged between 18 and 63. 11 of the surveys gave ages in the 20s, making the 20s the most surveyed age group in the *Ulaanbaatar* survey.

Question #2 asked the survey taker if they have ever heard of tree planting groups such as My Club or the Onggi River Movement. A slight



majority (53.3%) of responses claimed familiarity. 40% of surveys showed no familiarity with such projects. (Figure 3)

**Figure 4 - Ulaanbaatar General Survey Results**



Question #3 asked if survey takers had ever participated in a tree-planting project before. A majority (56.7%) had participated in tree planting before. 40% of surveys showed no participation in tree planting events. (Figure 4)

Question #4 asked if planting trees is important. 96.7% of surveys answered yes, tree planting is important. Only one survey (3.33%) said it was not important. (Figure 4)

Question #6 asked about whether or not the government could be trusted to take care of environmental issues. 43.3% of surveys said, yes they trusted the government, While a majority (53.3%) said no they did not trust the government. One response (3.33%) chose other. They elaborated that, “Government, NGOs, individuals should work together. The government should financially support, and provide education”. From those who answered they trusted the government, one survey elaborated on the choice, stating that, and “the president a one day tree planting day”. From those who responded no, one chose to elaborate that, “[environmental problems] can only be solved by all people”. (Figure 4)

Question #7 asked if an individual could positively change the environment. Most surveys replied yes, (76.7%), while 16.7% answered no, and 3.33% answered other. One survey elaborated on answering yes, and gave the reason, “someone starts an NGO or starts cleaning streets, it creates an

inspiration, a role model". Three surveys elaborated on the answer no, and stated, "Who would listen to an old man like me? All power is in the hands of the ministries of government. If government listens to citizens things would be much better", "everyone should be educated", "one cannot bring change, one should bring positivity". The last elaboration given was in regards to the answer, other. The surveys responded that Individuals couldn't bring that much change". (Figure 4)

### Interviews

Eight interviews were taken in *Ulaanbaatar*, though only four will be reviewed in this study. One interview was conducted with the Executive director of the Onggi River Movement, a second with a member of the Zorig foundation, a third with the Ever Green Company, and a final interview with a tourism based tree-planting organization.

In the interview with Gantulga, the executive director of the Onggi River Movement, he was first asked to outline the movement's goals. He explained that the Ulaan Lake has dried out and that they wish to restore water flow to this lake. He said that the main approach to this is to provide trees and advice to families who would be interested in planting the given trees in order to help rehabilitate the flow of the river. The main approach for education is to give advice to one member of the *Community* who can later share their knowledge with others in the *Community*. When asked about tree-planting methods, Gantulga responded that they chose their tree planting locations based on a study performed by the Environmental ministry in 1989. They encourage communities to make their fields consist of 70% sea buckthorn and 30% other plants. He stated that they do not encourage the use of pesticides and they only use animal derived fertilizers. When asked why they chose the *Community* approach, he responded that in the past the Movement provided fences and salaries as well as trees for families, but they found that most of these families had abandon the trees. It was then that the movement changed their approach by only providing trees and advice. He explained that this made families more involved because the trees were now their property. When asked about successes and difficulties, Gantulga replied that they are proud to be one of the first organizations of its kind, and they could act as a role model

for other groups. As for difficulties, the biggest problem is having enough water, though in the past the biggest problem was reliability of people to care for the plants. When asked what he thought the biggest environmental problem was mining because of the effects it has on the environment.

An interview was given with a second tourism based tree-planting organization. The informant works for a company that is stationed in the Gobi desert and host travelers who are interested in planting trees to commemorate a loved one, their trip, etc. They went on to say that trees are incredibly important in the Gobi because of all the dirt and the wind and that they are trying to promote awareness of these issues through their program. The family who continuously lives near the trees educates visitors on how to plant the trees properly. The founder of this organization also would visit schools and give guest lectures to schoolchildren to raise awareness. The trees that are planted are all native to the Gobi and are planted by tourists and the stationary family who cares for the trees year round. In the *Summer* the trees require a large amount of water, but they only water the trees when the sun is not at its hottest, this way it does not evaporate. During the 1980's the program was at its prime. They had over thirty employees and the movement had more support. Now one of the biggest difficulties the project faces is finding, "sustainable funding". Most groups and people are not interested in helping because the project is not lucrative. The informant will later be referred to as Volunteer Travel in the discussion section.

The third interview in *Ulaanbaatar* that will be discussed is a meeting with Tungalag the agronomist from the Ever Green Company. She outlined that her company had five main goals: give ecological education to citizens, create a love for nature, make Mongolia green, protect rare plants, and prepare and grow plants for planting. The company has a classroom that they use to host *Community* classes on trees and nature. On the property they also have a greenhouse, yard, and storage basement used for harboring and growing plants that can be sold. The company sells plants, give advice and even help plant trees for companies and or individuals. Once the trees are planted they are no longer property of Forever Green. The company also encourages an appreciation of nature in children through the use of gift giving. Children are given a leaf shaped pieces of paper and told to write a wish and their phone

number and hang up the wish on a tree. Workers then collect all the wishes and volunteers choose wishes that they will try to fulfill. The hope is that when the children receive a gift they will be told that it is because of the trees that their wish came true. When talking about the biggest success Tungalag claimed that her company has been able to provide seeds to every *aimag* in Mongolia. She went on to say the, “We receive support from the local people, they help us to collect the seeds. For example if person collects seeds from a tree then he won’t harm this tree ... so it’s becomes the ecological education”. When asking about the difficulties, Tungalag stated that it can be difficult to sell the trees because the government does not support the green economy in Mongolia and that they support the importation of Chinese trees, which are not native and bring diseases with them.

In an interview with Badruun Gardi, from the Zorig Foundation, the topics of *Community*, and Mongolian mentality were discussed. In the interview Badruun discussed the NGO’s goals of *Community* building, and how they have worked on registering many of the families in the ger districts of *Ulaanbaatar*. He went on to say that they have hosted numerous workshops with people in the ger districts and the one of the largest successes was that many of the participants have created strong networks with each other, and lasting friendships. Badruun stated, “What we want to do in the form of *Community* development is to create social support networks and *Community* building”. The word *Community* in itself was then discussed. Badruun clarified that while there are numerous word for *Community* in Mongolian, there is no single word that covers the variety of meanings the English word has, and that the idea of, “*Community* is a new concept to Mongolians”. He then went on to explain that it is important that Mongolians start working to understand how living in high population areas such as cities requires more common effort practices.

## Comparisons

### Survey

Question #5 of the general survey and question #4 of the My Club survey was one question asking the survey taker to identify what they thought were the biggest environmental problems in Mongolia. Most surveys had more than one answer, while some provide no answer. All answers have been compiled into one chart for cross comparison. (Table 6)

**Table 6 - Answer Comparison: Mongolia's Biggest Environmental Problem**

| Response                           | UB        | <i>Uvurkhangai</i> | <i>Dornogovi</i> | My Club   | Total     |
|------------------------------------|-----------|--------------------|------------------|-----------|-----------|
| Desertification                    | 7         | 3                  | 15               | 21        | <b>46</b> |
| Pollution*                         | 12        | 4                  | 5                | 13        | <b>34</b> |
| Water**                            | 8         | 4                  | 6                | 9         | <b>27</b> |
| Mining                             | 7         | 1                  | 4                | 2         | <b>14</b> |
| Drought***                         | 2         | 3                  | 2                | 3         | <b>10</b> |
| Litter****                         | 2         | 5                  | 1                | 1         | <b>9</b>  |
| Deforestation                      | 3         | 2                  | 0                | 2         | <b>7</b>  |
| <i>Zud</i>                         | 0         | 1                  | 2                | 0         | <b>3</b>  |
| Lack of environmental appreciation | 0         | 2                  | 0                | 0         | <b>2</b>  |
| Land degradation                   | 0         | 1                  | 0                | 0         | <b>1</b>  |
| Total for Each Location/Event      | <b>41</b> | <b>26</b>          | <b>35</b>        | <b>51</b> |           |

\* Responses related to any form pollution.

\*\*Responses related to water, water availability, or water quality.

\*\*\*Responses related to drought, and dryness.

\*\*\*\* Responses related to litter, trash, and rubbish.

The most popular answer for the *Ulaanbaatar* survey was pollution. 29.3% of all answers were related to some form of pollution. Within *Uvurkhangai* litter was the most common with 19.2% of answers related to rubbish, or litter. In *Dornogovi* the most popular response was desertification with 42.9% of the total answers relating to desertification. The My Club survey showed similar results, as desertification was the most popular answer, though in the My Club survey desertification counted for 41.2% of responses.

When comparing the frequency of responses across all survey groups, *Uvurkhangai*, *Ulaanbaatar*, My Club, and *Dornogovi*, desertification was the most common answer. The second and third most frequently answered problems were pollution and water respectively.

### Discussion

## Survey

From the general surveys taken in *Ulaanbaatar*, *Dornogovi*, and *Uvurkhangai*, trends in the awareness and thoughts on importance were observed. In two out of the three general survey groups, majorities of people were familiar with *Community* based tree-planting projects. While not everyone was familiar with such projects, 83.3% of all general survey takers said that it is important to plant trees in Mongolia. Though an overwhelming majority of survey takers thought it was important to plant trees, only 74.4% have participated in a tree-planting event. In addition most citizens believed that as an individual they could make a positive change to the Mongolian environment. (Figures 2, 3, 4)

It has become apparent that while most people do think that it is important to plant trees, and think that they as an individual can make a difference, many survey takers have never themselves participated in a tree-planting project. Though people care and think that they could help, something is keeping them from participating. When comparing graphs a direct correlation between the number survey takers who had never participated in tree planting and the number of survey takers who were not familiar with tree planting organizations was present. (Figures 2, 3, 4) The lack of awareness in survey takers of tree-planting organizations entertains the idea that not enough outreach or advertising has been done.

While a direct correlation between familiarity with programs and participation was seen, advertisement issues may not be the only reason for people not participating. In interviews with Volunteer Travel and Gantulga the topic of motivation was discussed. In these talks it was concluded that while some people are willing to join movements out of personal interest, many seek benefits from their participation. The potential lack of motivation must be addressed by tree-planting organizations, and some time should be spent researching motivating factors in tree-planting movements and the *Community* at large. In a study conducted on productivity, motives and participation, it was found that relationships such as friendships encourage participation, and motivated volunteers to join in various activities (Lento, 2011). This could be one future method used by tree-planting groups to increase participation and access those who are potentially interested yet have not taken part.

## Case Studies

### Onggi River Movement: Continuous Participation

The Onggi River Movement is what may be considered a continuous participation tree-planting program. Unlike other programs that mainly rely on traveler or temporary volunteers, the families who participate in the Onggi River Movement own the trees and are responsible for the care of the trees year round. The primary goals of the movement are to restore river flow of the Onggi River to Lake Ulaan through the planting of trees along the Onggi River (Gantulga).

The Onggi River movement chose the sea buckthorn bush as the primary plant that the foundation would provide. This plant was chosen for its resilience to saline waters, need for relatively little water, natural occurrence in Mongolia, and for the berries which can be used for food and medicine (Sea-Buckthorn). The sea buckthorn is the perfect plant for the Onggi river movement, for the plant is not only native to the area, but it has natural restoration abilities. Sea buckthorn plants are efficient at nitrogen fixation, which can help with soil conservation, and has been found to encourage the growth of other plant varieties (Lei et al.).

The numerous families in the region care for the trees every week through acts such as watering, collecting berries, or trimming. While visiting the study site it was observed that a severe hailstorm had damaged the trees in previous months. Many of the plants were broken and had large scars upon their branches. Families waited until spring to see which branches were able to bud, and trimmed all dead branches. Pruning can help create more room for healthy branches and has been shown to increase the productivity of fruit trees. In studies on the effects pruning has on mango trees, trees were found to increase their fruit productivity and vegetation density (T. Yeshitela).

The leaders of the Onggi River Movement encourage participating families to have 30% of the tree fields consist of trees other than sea buckthorn. While multiple varieties of trees were present at the study site, plants other than sea buckthorn were scarce. The field appeared to be monoculture of sea buckthorn rather than the planned 70%. This inconsistency with the Onggi River Movement's recommended practices is concerning

because of the negative effects hosting monocultures can have on the plants themselves. In studies performed on rice field monocultures, issues such as, soil fertility, pest population increase, salinization and declines in harvests were examined (Díaz, 2009). More monitoring from *Ulaanbaatar* officials may be needed to ensure that the programs outlined methods are implemented properly.

In the past the Onggi River Movement has experience other monitoring problems. During the beginning stages of the Onggi River movement one of the biggest problems was finding a way to encourage families to participate. Families were originally given free trees, fencing, and received pay for their participation. Even so, during the execution of the project, many families that were given plants abandoned them and kept the money that had been given to them. The movement then adapted their approach so that only trees were provided to families. This made it so that only families who had true intentions of caring for the plants would agree to take them. Each family caring for trees has their own private field. This project is *Community* based in the sense that families give advice to one another and co-own buildings structures such as greenhouses. While families do help one another with various tasks, each lot is privately owned. While the dependence on families to care for their property is one of the driving forces that encourages active participation, it also has been seen to hindered involvement.

Many families join the movement because of their interest in harvesting berries, but families must keep in mind that they are ultimately responsible for the health and productivity of the plants. This is problematic for many of the *Community* members who have chosen to not participate in the project. The leading reason for not participating in the project as observed by the interviews is that most families do not have enough time, or people to care for plants as well as their herds. Despite their decisions to not participate, families did show an interest in tree planting if they had the time and resources. While the movement does focus on making the plants an individual families property, it might be beneficial to have one lot that belongs to multiple families. This would enable those families who are busier or located far away to have the opportunity to participate while not carrying the same



working load as those families who own private lots. Though each family would have to spend less time working on the plot, said families will also have to share the berries that are produced.

The Onggi river movement is funded by the production of the sea buckthorn berries. When families join the project they sign a contract that states that 30% of the profits raised from the selling of the berries will be given back to the Onggi River Movement. The 30% is spent on the distribution of more plants and the creation of environmentally focused schoolbooks (Oyuna). The positive feedback loop of berry production funding future trees is one of the most appealing attributes of the Onggi River Movements practices, as it is self sustaining as long as the plants remain healthy.

#### Sainshand Secondary School #1 - Educational Eco-Clubs

In 2007 the secondary school of *Sainshand, Dornogovi* started an educational environmental eco-club. Through this eco-club students are encouraged to learn how to take initiative and learn good work ethics while learning about environmental issues and taking part in projects such as tree-planting. The students plant all the trees on campus grounds and collect the trees seeds as the plants mature.

The club uses native species for their project and only collects seeds from plants that belong to the school. Trees like the *Ulmus macrocarpa* are native to the land and are drought resistant. These plant varieties are well suited for the Gobi climate and require less water than most vascular plants (Liu, 1989). Though all of the selected plants have the potential to survive the harsh conditions of the Gobi, proper placement is crucial to their survival.

Dolgormaa Borkhuu, a resident biology teacher of the school, acts as the clubs adviser, and has educated the children on tree planting. The children have been provided with numerous books and pamphlets on tree planting practices specific to the Gobi from organizations such as UNDP and WWF. Though the students can easily access information of planting practices, supervision of the students during site selection is needed. One tree on the

school campus in particular brought the issue of location to the researchers attention.

While receiving a tour of the schoolyard, most trees were found to be green or budding, but one tree pointed out by Dolgormaa was free of leaves and appeared to be dead. From what was understood from the translations, Dolgormaa explained that the tree was indeed dead, and that someone had planted the tree without looking at the schools plumbing map. After the tree had been planted it grew well for some years until the roots had to compete with the underground piping for space, causing the tree to die. Though only one plant seemed to have faced such a grim fate, site location is not something that should remain unmonitored. The planting of trees in locations that will eventually cause the tree to die is counter productive and ultimately wastes seed and water resources.

While school officials should implement further monitoring, the students who participate in the club typically present excellent work. Each year the members of the club who graduate appoint successors to take their place in the club when they leave. The practice of appointing successors is efficient because in theory, the club should always have enough members to stay running, as the cycle of graduating and appointing continues. In addition to the general sustainability of the appointing cycle, club membership is further enhanced through motivational devices such as awards. Club members who exhibited positive attributes such as good a work ethic or creativity were offered an award, or prize for their work. For example, several previous club members were invited to travel to Japan by a Japanese organization as a reward for their hard work.

#### Ever Green Case Study- Informative Tree Provider

Ever Green is a plant growing company based in *Ulaanbaatar* whose main goals are to give ecological education to the public, promote a love for nature and to provide advice and plants to customers interested in planting trees. During the researchers visit to “The Green House”, the researcher was given a brief tour around the property.

On the premises of the property a classroom, yard, basement, and greenhouse were found. Within the green house an incredible assortment of

seedlings were also found. Plant varieties ranged from the native sea buckthorn shrub to the domesticated strawberry. While the variety and abundance of the greenhouse was refreshing, the issue of native plant varieties is of concern. Though some varieties of plants that were sold at Ever Green were native, many varieties of the plants grown were not. Studies in the Galapagos Islands have shown a direct correlation between non native species density and decreases in native biodiversity due to non-native plant varieties becoming invasive (Rentería, 2012). The invasive tendencies of non-native plants is one of the reasons it is not advised that that non-native species be sold to the public.

With that said the company does promote the use of local grown trees in order to avoid invasive pests or diseases. The company personally grows the plants themselves and encourages people to not buy foreign grown plants. Tungalag stated, “[The government is] supporting [the] Chinese- they buy every year many trees from China. They do not understand that with the trees they also bring the diseases, insects from China with the trees because they come with soil.” In a study conducted on the invasiveness of white flies and infected tobacco plants, it was found that the invasive white fly populations were propagated more efficiently in the tissues of diseased tobacco than healthy tobacco (Jian-Yang Guo, 2010). The Ever Green Company’s attempts to prevent such pests from entering Mongolia are one of the most positive ecologically sustainable practices they demonstrated.

One of the most organizationally sustainable practices that Ever Green displayed, was the employment of countryside families to grow seedlings and collect seeds. Tungalag explained that the company creates an agreement with countryside families, which promises the families a share of the proceeds; produced from the sale of the plants that family grows. This practice encourages families to care for the plants, as they will receive a monetary reward for the production of healthy plants. This practice is similar to that of the Onggi River movement in that families share the proceeds produced by plants, with the organization.

#### Tourism Based Case Study

Two tourism based volunteer tree-planting projects will be analyzed in the study. The first is *Hamriin Hiid* and the second is an independent tourism agency that has chosen to remain anonymous and will be referred to as Volunteer Travel. Both projects are stationed in the Gobi and are cared for year round by an individual or individual family.

Both *Hamriin Hiid* and Volunteer Travel have chosen to use native plant species to the Gobi desert. In addition to their choice to plant native trees, the programs do not use pesticides, and only use organic fertilizers. The use of chemical fertilizers has been found to negatively impact the growth of vertebrates such as amphibians (Baker). While there are no amphibians in the Gobi, the possible harmful effects that fertilizers can have on vertebrates are an important reason to not promote the use of pesticides. *Hamriin Hiid* gave note that they typically use a combination of bird droppings and dung as their choice fertilizer.

The *Hamriin Hiid* tree-plant site had very few environmental sustainability issues. The only concerning observation was the abundance of litter in the planting site. All litter in the area had come from *Hamriin Hiid*'s monastery and the ger *Community* surrounding *Hamriin Hiid*. Though the tree-planting project is not directly responsible for the litter, it is important that *Community* members monitored trash collection more carefully.

One of the biggest problems these two tourism companies have in common is that little to no advertisement or *Community* outreach is done. *Hamriin Hiid* is known as a religious landmark and the tree-planting project relies on its connection to the monastery for gaining volunteers. These volunteers' primary reasons for visiting may not be related to tree-planting. When discussing advertisement and outreach, Volunteer Travel stated, "We are not a show business," and showed a general disapproval of creating spectacle tree-planting events as a form of advertisement.

The second biggest issue faced by tourism-based projects is funding. Both projects face the problem of finding workers because of the programs low profitability. During the tour of *Hamriin Hiid*, Batsaikhan told the researcher that the second grounds keeper had recently quit because the salary was too low. In the case of Volunteer Travel, participating in the tree planting is not free, which further discourages the involvement of anyone who has a

low income. When asked about the biggest problems, Volunteer Travel claimed, “it is hard to get support, sustainable funding is the biggest problem”.

*Hamriin Hiid* and Volunteer travel are not the only eco-tourism based groups facing the problems of advertising and sustainable support. In research performed on the sustainability of eco-tourism as a form of conservation, conservation based eco-tourism projects (CBET) were found to be, “limited by factors such as the small areas and few people involved, limited earnings [...] the competitive and specialized nature of the tourism industry” (Kiss, 2004). It is apparent that tourism based eco-projects largest sustainability problems lies is tourism itself.

#### My Club Case Study – Annual Event

The My Club tree-planting event was hosted in *Tsonjin Boldog* on the national day of tree planting in May. My Club is a club that runs year round, and has its own official club members. In addition to these members, volunteers come to help with special events such as the national day of tree planting. The event started with a bus ride full of high school and college students to the planting site. When at the event, the Head organizer took some time to remind the volunteers why they were there and why it was important that they attend. The event was funded by a Korean organization called Green Asia. From what the researcher could understand, the purpose of Green Asia funding this project was to help reduce desertification in Mongolia.

Though the event is only in its second year of action, the club and the one-day tree-planting event are well publicized. There were more than enough volunteers at the event, though exact numbers are not available, about three tour busses full of people were taken to the event. When at the event a news station conducted interviews and did a broadcasting on the My Club tree planting. The club has advertised its presence over social media pages such as Facebook. Through Facebook people who have like the page get numerous updates on the current and past events, as well as pictures of the clubs activities.

After the introductory speech, volunteers were asked to stand in a large circle. Official club members went around the circle and numbered off the volunteers into groups. The premise of the numbering off was to break up the

cliques of friends or coworkers that had attended the event. This practice was a positive practice, as it encouraged volunteers to meet other volunteers and expand the number of relations they had at the event. This practice is important because the third most common reason volunteers gave for attending the event was that they came with a group of friends, students or colleagues. (Table 1) The breaking up of cliques has also been shown to improve productivity. In a study focused on motivation and group dynamics, it was found that while group relations do encourage participation, having friends working together showed to be distracting and caused a decrease in the amount of work accomplished (Lento, 2011).

The general planting process went as follows: each person digs five holes, a tree is placed within the hole, the roots were covered and the hole is filled about 2/3 of the way with soil, packed down, and then each sapling received 2 buckets of water. While this practice was accomplished with ease and all volunteers followed the given instructions, one element of the process was concerning. In order to fill buckets with water, volunteers would walk to large pits that had been dug. These pits were large man made depressions that were: dug, covered with a plastic liner, and then filled with water from a large hose. While the open pit method of providing water was time efficient, it was not necessary, as a hose was already present. These large holes are troublesome due to the similarities it has to deep plowing. In previous studies, deep plowing has been shown to disrupt the natural growth rates of flora in an area. While shallow plowing had minimal effects vegetation regeneration, deep plowing deprives the broken up land from regenerating flora properly (Joulbert, 2009). While there were only short grasses in the area of planting, the biological functions of the displaced grass must be kept in mind when choosing to use methods similar to deep plowing.

A final concern related to the annual event format is the age distribution of plants. Through simulations, forests consisting of single size and age trees have shown to be more prone to water runoff (Toda). This is of concern for My Club because the once a year event calls for the mass planting of saplings in one area. Though trees will be planted each year for this event, the new trees are not planted amongst the old ones. Though the new trees are planted adjacent to the last year's trees in their own section. Mixing the ages

of trees would be a simple way to prevent future problems with water run off and water retention.

### **Conclusion**

Over the years, *Community* based tree planting projects have sprouted up across Mongolia. Though there are numerous groups and methods for approaching *Community* involvement as well as organization, Some methods have been found to be more sustainable in the realms of environmental and organizational sustainability.

Through the research numerous sustainability problems were addressed and analyzed through the case studies of: *Hamriin Hiid*, Volunteer Travel, My Club, The Onggi River Movement, *Sainshand* Secondary School #1, The Ever Green Company, and the numerous surveys received from the study sites of *Ulaanbaatar*, *Dornogovi*, and *Uvurkhangai*. Each case study had their own sustainability practices and therefore faced different sets of sustainability problems. Though all problems faced varied from case to case, some problems occurred more frequently.

From the research gathered, it has been concluded that the largest sustainability issues that *Community* based tree planting projects within Mongolia face are water availability and sustainable support.

Though water is one of the largest problems involved with tree planting, investment in water resources is also one of the keys to reducing problems such as desertification. With that said, water availability will likely remain low until trees have sequestered enough water to enable water. When interviewing Buyantogtokh from *Hamriin Hiid*, he stated that tree planting has always required a lot of water, but what has changed is the need to invest. From what was understood from translations, the key idea is that in order to promote the rise of water levels, some form of priming the pump, so to speak, must be taken. In the case of tree planting, trees must continue to receive water, despite unfavorable conditions, so that they can slowly begin to encourage water availability (Buyantogtokh).

Sustainable support was found to be the second characteristic problem of *Community* based tree planting. Problems with support were found to be both support in the forms of funding and participation. While some groups

displayed strong member participation, it could be said that groups such as *Hamriin Hiid* and Volunteer Travel had low involvement rates. In addition to low involvement for tourists, companies have received little financial support, and companies struggle to create their own reliable funding source.

Out of the numerous categories of *Community* based tree planting projects in Mongolia, one category showed itself to be more sustainable both in terms of environmental and organizational practices. The eco-club practices of Secondary school #1 in *Sainshand* were found to be the current best practice of Mongolia's *Community* tree-planting projects. The eco-club was chosen for three promising attributes. The first quality that makes *Sainshand*'s secondary school's eco-club desirable is the general earth friendly practices such as using native plants and not using pesticides. The second most appealing quality is their use of motivational rewards. Finally the most desired attribute demonstrated was the sustainable generation of labor.

### **Ideal Model**

During the research, the researcher observed many favorable and unfavorable practices in tree planting projects. In an attempt to better the success of some *Community* based tree-planting projects, a model plan for a tree planting organization has been produced. This model combines the most positive attributes of each case study observed, in attempt to create one functional model that could be used by numerous groups. The outline goes as follows:

- 1) **Use local Volunteers or Schools-** School are sedentary, and unlike foreign travelers, the students and staff will remain throughout the year. Every year graduating students are replaced by a new incoming group of students, which allows for continuous membership. Volunteers can also be used, as long as they are not long distance travelers, and will remain relatively close to the planting site year round. The use of volunteers and students allows for constant support that does not require pay. This allows for funds that are raised to be spent on things other than workers pay.
- 2) **Raise Environmental Awareness, Education, and Appreciation of Nature** - When people are aware of the environmental problems facing



the earth they live on, a greater understanding of how they as an individual can influence the environment is achieved. Raising environmental awareness helps increase the number of people willing to work without pay, which is likely caused by a feeling of civic duty.

- 3) **Advertise (If Volunteer Based)**- This allows for those who have been influenced by education, appreciation and awareness, to see that there is a group of people who share their interests and goals in regards to nature. This will encourage newcomers to join the project.
- 4) **Events**- While planting is a yearlong process, it is beneficial for the projects longevity to have more frequent specialty events. These events can help keep members interested and can keep the project visible to the public eye.
- 5) **Benefits**- Benefits should be offered to those who donate their time to the project. While monetary rewards are not encouraged, motivating participants with small awards or distinguishing honor can encourage a positive morale and add a competitive edge to participants' mindset.

While this ideal model should produce a program that displays a both environmentally and organizationally sustainable foundation, for a community based tree-planting program, there is still much questioning over the ability of *Community*-based tree planting programs to assist and alter the environmental problems they set out to resolve. This uncertainty could form the bases for further research on *Community* based tree planting. The hunt for sustainable practices must go on. If not for anything else, the researcher has learned that when it comes to *Community* based tree planting, no whether it be people or trees there is power in numbers. "It is hard to change with one person, [it is] better to collaborate with others" (Anonymous).

## References

- Baker, N. J., Bancroft, B. A., & Garcia, T. S. (2013). A meta-analysis of the effects of pesticides and fertilizers on survival and growth of amphibians. *Science Of The Total Environment*, 449150-156. doi:10.1016/j.scitotenv.2013.01.056
- Batkishig O. HUMAN IMPACT AND LAND DEGRADATION OF MONGOLIA. . , 1.
- Szarek-Łukaszewska (2009). Vegetation of Reclaimed and Spontaneously Vegetated Zn-Pb Mine Wastes in Southern Poland. *Polish J. of Environ. Stud. . Vol. 18, No. 4, .*
- Diaz GS (2009). Estudio de diferentes prácticas agrícolas para buscar sostenibilidad en la producción arrocera.. *Cultivos Tropicales. 2009 Vol. 30 No. 1*, pp. 49-55.
- Deal, J. J., Stawiski, S., Graves, L., Gentry, W. A., Weber, T. J., & Ruderman, M. (2013). Motivation at work: Which matters more, generation or managerial level? *Consulting Psychology Journal: Practice and Research*, 65(1), 1-16. doi:http://dx.doi.org/10.1037/a0032693
- Eastern Steppe, Mongolia.* (n.d) retrieved May 4 2013, from Wildlife Conservation Society Web Site: <http://www.wcs.org/saving-wild-places/asia/eastern-steppe-of->
- Ganbold, Da.. "Urban Environmental Challenges." Urban Environmental Challenges. SIT. SIT, *Ulaanbaatar*. 19 Mar. 2013. Class lecture.
- Gobi Desert.* (2010). retrieved May 4 2013, from Gobi Desert Web Site: <http://gobidesert.org/>
- Guo J-Y, Ye G-Y, Dong S-Z, Liu S-S (2010) An Invasive Whitefly Feeding on a Virus-I nfected Plant Increased Its Egg Production and Realized Fecundity. *PLoS ONE* 5(7): 11713. doi:10.1371/journal.pone.0011713
- Imeson, A (2012). *Desertification Land Degradation and Sustainability*.. UK: John Wiley & Sons, Inc..
- Joubert, L. L., Esler, K. J., & Privett, S. J. (2009). The effect of ploughing and augmenting natural vegetation with commercial fynbos species on the biodiversity of Overberg Sandstone fynbos on the Agulhas Plain, South Africa. *South African Journal Of Botany*, 75(3), 526-531. doi:10.1016/j.sajb.2009.05.002
- Kiss A (2004). Is *Community*-Based Ecotourism a Good Use of Biodiversity Conservation Funds?. *Trends in Ecology & Evolution.* , pp. 232-237.
- Leach M (1999). Environmental Entitlements: Dynamics and Institutions in *Community*-Based Natural Resource Management. *World Development. Vol. 27, No. 2,* p. 225±247,.
- Lei, Q., Y. Zhong and H. Yang (1983). Effects of nitrogen supply from sea-buckthorn in artificial woods of Simon poplar. *Forest Science and Technology* 4: 21-24. (In Chinese).
- Lento T. M (2011). How social are social movements? Social ties, local network structure, and continued participation in voluntary associations. . , .
- Lian, Y. (1988). New discoveries of the genus *Hippophae* L. *Acta Phytotaxonomica Sinica* 26: 235-237.

Liu Q (1989). Drought resistance of the major tree species in Fuxin of Liaoning province.. *Journal of Northeast Forestry University*. Vol. 17 No. 1, pp. 93-99.

Northeast Asia Economic Forum Meeting (2007). Mongolia: The 16th Northeast Asia Economic Forum Meeting. . , 2,4.

President Tsakhiagiin ELBEGDORJ. (n.d) retrieved 06/12/2013, from President of Mongolia Tsakhiagiin Elbegdorj Web Site:  
<http://www.president.mn/eng/president/biography.php>

Rentería JL, Gardener MR, Panetta FD, Atkinson R, Crawley MJ (2012) Possible Impacts of the Invasive Plant *Rubus niveus* on the Native Vegetation of the Scalesia Forest in the Galapagos Islands. PLoS ONE 7(10): e48106. doi:10.1371/journal.pone.0048106

Sea-Buckthorn - A Promising Multi-Purpose Crop For Saskatchewan. (n.d) retrieved June 01 2013, from Agriculture and Agri-Food Canada Web Site:  
<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1198782587774>

Tiwary R (2001). Environmental Impact of Coal Mining on Water Regime and Its Management. *Water Air and Soil Pollution*. , .

Toda, M., Yokozawa, M., Emori, S., & Hara, T. (2010). More asymmetric tree competition brings about more evapotranspiration and less runoff from the forest ecosystems: A simulation study. *Ecological Modelling*, 221(24), 2887-2898. doi:10.1016/j.ecolmodel.2010.

Tungalag, Aa (2008). LAND DEGRADATION ANALYSIS IN THE ONGI RIVER BASIN. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*. Beijing . XXXVII. Part B7, .

VAREJA O-SILVA MA´RIO ADELMO (1998). A Coupled Biosphere–Atmosphere Climate Model Suitable for Studies of Climatic Change Due to Land Surface Alterations. *JOURNAL OF CLIMATE*. 11, .

World Bank (2006). MONGOLIA Lessons from Tree Planting Initiatives. *Environment and Social Development—East Asia and Pacific Region* . , 22.

Yeshitela T, Robbertse PJ, Stassen PJC (2005) Effects of pruning on flowering, yield and fruit quality in mango (*Mangifera indica*). *Australian Journal of Experimental Agriculture* **45**, 1325–1330.

Badruun 5/7/13

Volunteer Travel 5/10/13

Tungalag 5/10/13

Dolgormaa Borkhuu 5/14/13

Buyantogtokh 5/15/13

Batsaikhan 5/15/13

Uvurkhangai Family 1 5/19/13

Uvurkhangai Family 2 5/19/13

Uvurkhangai Family 3 5/19/13

Uvurkhangai Family 4 5/20/13

Uvurkhangai Family 5 5/20/13

Uvurkhangai Family 6 5/20/13

Uvurkhangai Family 7 5/20/13

Uvurkhangai Family 8 5/21/13

Oyuna 5/22/13

Gantulga 5/24/13

## **Appendix**

### 1.1

#### English My Club Survey:

1. Age\_\_\_\_\_
2. Why did you come to this event?
3. Do you think it is important to plant trees in Mongolia? Why?
4. In your opinion, what is Mongolia's biggest environmental problem?
5. Do you trust the government to solve environmental problems?  
Yes/No/Other\_\_\_\_\_
6. Do you feel that being a part groups like My Club has made you more connected to your *Community*? Yes/No/Other\_\_\_\_\_
7. Do you feel that you, as an individual, have the ability to positively change Mongolia's environment? Yes/No/ Other\_\_\_\_\_
8. Do you think that *Community* based environmental projects are well organized?
9. How do you think *Community* tree-planting projects can be made more efficient?

### 1.2

#### Mongolian My club Survey:

1. Нас
2. Та яагаад энэ арга хэмжээнд оролцох болсон бэ?

3. Таны бодлоор Монголд мод тарих чухал уу? Яагаад?
4. Таны бодлоор Монголд тулгарч буй хамгийн том байгаль орчны асуудал
5. Та засгийн газар байгаль орчны асуудлыг шийдвэрлэж чадна гэдэгт итгэж байна уу?  
А. Тийм Б. Үгүй  
В. Бусад (өөрийн саналаа бичнэ үү)
6. Та My Club зэрэг клубуудэд нэгдэснээр нийгмийн ажилд илүү оролцож, нийгэмтэйгээ илүү ойр болж байна гэж бодож байна уу?  
А. Тийм Б. Үгүй  
В. Бусад (өөрийн саналаа бичнэ үү)
7. Та хувь хүний хувьд Монголын байгаль орчны асуудалд эерэгээр нөлөөлөх чадвартай гэж бодож байна уу?  
А. Тийм Б. Үгүй  
В. Бусад (өөрийн саналаа бичнэ үү)
8. Таны бодлоор хоршоолол хэлбэрийн байгаль орчны төслүүд сайн зохион байгуулалттай байж чаддаг уу?
9. Хоршоолол хэлбэрийн байгаль орчны төслүүдийг яаж илүү үр дүнтэй болгох вэ гэдэг дээр өөрийн саналаа бичнэ үү?

## 2.1

### English General Survey:

1. Age\_\_\_\_\_
2. Have you ever heard of *Community* based tree-planting projects such as, My Club or the Onggi River Movement? Yes/No
3. Have you ever participated in a tree-planting event? Yes/ No
4. Do you think it is important to plant trees in Mongolia? Yes/No  
a. Why or why not?
5. In your opinion, what is Mongolia's biggest environmental problem?
6. Do you trust the government to solve environmental problems?  
Yes/No/Other\_\_\_\_\_
7. Do you feel that you, as an individual, have the ability to positively change Mongolia's environment? Yes/No/ Other\_\_\_\_\_

## 2.2

### Mongolian General Survey:

1. Нас

2. Хоршоолол хэлбэрийн байгаль орчны төслүүд буюу мод тарьдаг My Club,  
Онги голын хөдөлгөөнүүдийн талаар сонсож байсан уу?  
Тийм\ Үгүй
3. Та өмнө нь мод тарих үйл ажиллагаанд оролцож байсан уу?  
Тийм\ Үгүй
4. Таны бодлоор Монголд мод тарих нь чухал уу ? Тийм\ Үгүй  
Хариултаа дэлгэрүүлж тайлбарлана уу
5. Таны бодлоор Монголд тулгарч буй хамгийн том байгаль орчны асуудал
6. Та засгийн газар байгаль орчны асуудлыг шийдвэрлэж чадна гэдэгт итгэж байна уу?  
А. Тийм Б. Үгүй  
В. Бусад (өөрийн саналаа бичнэ үү)
7. Та хувь хүний хувьд Монголын байгаль орчны асуудалд эерэгээр нөлөөлөх чадвартай гэж бодож байна уу?  
А. Тийм Б. Үгүй  
В. Бусад (өөрийн саналаа бичнэ үү)