

# **Evaluating the success of a public engagement project for the conservation of the Ural Saiga population in Kazakhstan**

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"If you want one year of prosperity, plant corn.  
If you want ten years of prosperity, plant trees.  
If you want one hundred years of prosperity, educate people."

— *Chinese proverb*

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## **Abbreviations**

ACBK: Association of Conservation for Biodiversity in Kazakhstan

CBD: Convention on Biological Diversity

CEPA: Communication, Education and Public Awareness'

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora

CMS: Convention on Migratory Species

CVM: Contingent Valuation Method

CVM: Contingent Valuation Method

DEFRA: Department for Environment, Food & Rural Affairs'

EE: Environmental Education

MEA: Millennium Ecosystem Assessment

MoU: Memorandum of Understanding

MRB: Model of responsible behaviour

NAAEE: North American Association for Environmental Education

NGOs: Non-governmental organisations

SAC: Saiga Conservation Alliance

TPB: Theory of Planned Behaviour

UNCED: United Nations Conference on Environment and Development

UNDP: United Nations Development Programme

WTH: Willingness to help

WTP: Willingness to pay



## Abstract

Awareness campaigns are employed in many situations as a form of environmental education, in order to raise awareness and knowledge of the participants.

Aimed at adults and children alike, their overall aim is to foster positive attitudes and behaviour towards the target. It is also proposed that knowledge transfer between community members can multiply the effect of the campaign.

This thesis aims to evaluate the success of an awareness campaign which has been providing local communities with information on the ecology and conservation status of the Uralsk saiga population. The study provides an insight into how knowledge, attitudes and behavioural intent may have been influenced by the campaign, and the major variables which may influence the success of the campaign. Additionally, it aims to outline how 'external' conservation measures and processes are judged by local people, and how this impacts their success.

Finally, the thesis makes not only makes recommendations ,based on findings, for the future of the project in the region, but also highlights points of interest and future research s which may be of interest to all future conservation awareness campaigns.

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## 1. Introduction

Environmental education (EE) is increasingly being implemented in conservation interventions to provide audiences with appropriate knowledge to change attitudes and promote pro-environmental behaviour. EE can take several forms, from 'formal education' in school curricula and 'non-formal' public outreach, to 'informal' community engagement to 'communication' in environmental publishing and web-based activities (Salafsky *et al*, 2002).

Evaluation is the systematic assessment of the implementation and/or the outcomes of a project, compared to predefined standards, as a means to contributing to future projects (Weiss, 1998).

Evaluation of EE offers implementers and funders insights into how effectively funding has been spent, achievement of desired outcomes, and offers guidance on improvement of future programmes, providing evidence for adaptive management programmes.

However, many campaigns are never evaluated; Redford & Taber (2000) suggested that conservation lacks a culture in which critical evaluation of outcomes is seen as desirable; with concerns about highlighting shortcomings to stakeholders acting as a barrier. Some project implementers may view programme evaluation as diverting scarce funds away from 'actual' implementation and as costly and time consuming to implement (Clarke, 1996a). Additionally, the reactive nature of many interventions may prevent the collection of baseline data essential in evaluating campaign effectiveness.

This study is an evaluation of the first public awareness campaign highlighting the challenges facing the saiga antelope (*Saiga tatarica tatarica*) in the Uralsk region of Kazakhstan. It was implemented jointly by the Saiga Conservation Alliance (SCA) and the Association of Conservation for Biodiversity in Kazakhstan (ACBK).

Since the collapse of the Soviet Union in 1991 the population has faced a rapid decline of, 95% (SCA, 2010). The main threat to the saiga are unregulated hunting for its meat and male saiga horns traditionally used in Chinese medicine (Chan *et al*, 1995). This has led to a skewed population and reproductive collapse (Milner-Gulland *et al*, 2001). Recently, severe outbreaks of disease, alongside obstacles during migration (e.g. irrigation channels and roads) have caused further problems.

80% of the Kazakh saiga population live in three distinct populations. In May 2010 the Uralsk population suffered a devastating blow when nearly 12,000 females and calves died. This reoccurred in June 2011 with 500 deaths. The Kazakhstan population is estimated at 102,000 while the Uralsk population is estimated at 17,948 animals, a decrease of 31% in recent years (SCA, 2011).

While government scientists work to discover the cause of these die-offs a plethora of conspiracy theories abound in local villages; blaming the deaths on Russian nuclear tests, to toxic fog and deliberate poisoning by poachers (Agence France Presse, 2010).

The EE campaign was aimed at children and adults, targeting seven villages in the saigas' range. The campaign aimed to increase knowledge about the saiga and the challenges that the population faces. The overall goal was to promote pro-saiga attitudes and behaviour; laying the foundations for a long-term engagement programme working towards restoration of the saiga population.

This study reviews the outputs (what has been accomplished), but more importantly the short-term outcomes (what has changed as a consequence of the work) of the saiga awareness campaign in respect of meeting its objectives. Outcomes (see 1.7.1) may illuminate the audience's experience of the campaign and change occurring in knowledge and attitudes, which may indicate behavioural intent (Ajzen, 1991). Evaluating outcomes may be more valuable to funders and project managers providing a more in-depth overview of the efficacy of the project and offering a wealth of recommendations for best practice in future work. The current project was implemented shortly after a single, brief campaign; hence it is too soon to measure behavioural change and therefore only hoped to evaluate the relatively short-term effects of the intervention. Impact on the ultimate conservation goal of recovery of the saiga population is beyond the remit of this thesis.

## **1.1. Aims and objectives**

### **1.1.1. Aims**

This thesis aims to evaluate the success of the EE campaign which provided local communities with information on the ecology and conservation status of the Uralsk saiga

population. No previous saiga education has been carried out in the region, so the campaign offered a unique opportunity to establish a baseline and to assess any changes in attitudes, knowledge and behavioural intent. The study provides insight into not only how attitudes effect conservation, but also how 'external' conservation measures and processes are judged by local people.

### **1.1.2. Research objectives**

1. Evaluate if/how levels of knowledge, attitudes and behavioural intentions toward saiga changed, during the study period.
2. To assess any differences between socio-demographic groups regarding their experience of the campaign, in addition to knowledge of and interactions with saiga.
3. To understand local people's perceptions of threats to saiga and their conservation requirements and their own potential future role in saiga conservation
4. To make recommendations for future awareness campaigns and saiga conservation within the target villages.

## **1.2. The role of environmental education in conservation**

'Environmental education should be a continuous learning process where individuals become aware of their environment and acquire knowledge, values, skills and experiences to solve environmental problems for present and future generations.' (Vaughan *et al*, 2003).

The world's first intergovernmental conference on EE in 1977 developed a framework for EE to; Communicate the importance of the public's interactions with the environment and to develop their skills in responsibly managing their environment (The Tbilisi declaration, 1977).

EE can take several guises, from 'formal education' in school curricula and 'non-formal' public outreach, to 'informal' community engagement and 'communication' in environmental publishing and web-based activities (Salafsky *et al*, 2002).

### **1.2.1. Changing attitudes and behaviour**

Reviewing the literature indicates that EE should provide knowledge in order to change attitudes and behaviour to promote pro-environmental behaviour. Kollumuss & Agyeman (2002) described 'pro-environmental behaviour' as 'behaviour that consciously seeks to minimize the negative impact of one's actions on the natural and built world'. It seems pertinent to ask if this is possible and if so how?

Attitudes can be defined as a tendency to classify an entity by a level of favour or disfavour which is expressed in a behavioural response (Eagly & Chaiken, 1993), whereas 'Behaviour is a manifest, observable response in a given situation with respect to a given target' (Ajzen, 1991). Social Learning Theory (Bandura, 1977) suggests a combination of social and psychological factors influence behaviour; attention: retention (remembering what one observed), reproduction (ability to reproduce the behaviour), and motivation (good reason) to adopt the behaviour. Additionally, literature from psychotherapy regarding cognitive behavioural approaches to promoting change in cognitions and behaviour would suggest active participation and collaboration in awareness campaigns may encourage self-efficacy, empowerment and subsequently change (Beck, 1995).

### **1.2.2. Theoretical framework of responsible environmental attitudes and behaviour**

To understand interactions between people and saiga in Kazakhstan it is important to first outline the variables that can influence these attitudes and behaviour. Several theories are relevant to understanding people's interactions with wildlife which can be used to explain pro-environmental behaviour; importantly such theories suggest attitudes as significant predictors of behaviour (Wicker, 1969). It is beyond the scope of this thesis to review all of these; however, I have chosen to outline those most relevant to EE.

Despite conflicting research the concept of attitudes as 'precursors of behaviour' (Cohen, 1964), remains strong, La Piere, (1941) noted intention to act in a particular way was not always synonymous with actions, while Wicker, (1969) failed to establish a predictive link between attitudes and behaviour. However, later studies suggest a link between attitudes and behaviour (e.g. Schuman & Johnson, 1976; Seibold, 1980). These studies consider factors additional to attitudes influencing behaviour e.g. competing motives, economic,

social, and intellectual factors and the ability to perform the action. For example, Bradley *et al*, (1999) found after an EE course US high school students with higher post-test environmental knowledge scores also had more favourable environmental attitudes.

However, as Trehella *et al*, (2005) highlight even though increased knowledge may lead to positive attitudes, measuring their impact on behavioural change is challenging leading to a focus on proxies.

The 'Theory of Planned Behaviour' (TPB) (Ajzen, 1991) developed from Ajzen & Fishbein's (1980), 'Theory of Reasoned Action' would suggest intention to perform a pro-environmental action is determined by a combination of several components. The theory highlights intention (readiness to act) as the best predictor of behaviour. Intention is influenced by three factors; Behavioural belief (determining positive or negative attitude towards the behaviour), normative Beliefs (perceived social pressure (including familial and peer pressures) to carry out the behaviour), and perceived behavioral control (belief in ability to carry out the behaviour and factors that hinder this). These factors, in addition to actual behavioral control – a person's ability to carry out the action, all influence intention and ultimately, behaviour. Although the TPB may identify beliefs to be targeted in an intervention, it offers no assistance in how to change these (Sutton, 2002).

Highlighting behavioural change specifically in relation to the environment is helpful. Findings demonstrate that knowledge of environmental issues alone is not sufficient to elicit pro-environmental behaviour (Hungerford & Volk, 1990; Palmer & Birch, 2005). Even though community outreach may shape attitudes it cannot automatically be correlated to behavioural change and other factors need to be considered (Holmes, 2005). For example, women have been shown to have less environmental knowledge but more emotional engagement, showing more concern about environmental destruction and willingness to change. Additionally, longer durations in education, the greater the environmental knowledge expressed, although this may not mean more pro-environmental behaviour (Fliegenschnee & Schelakovsky, 1998; Lehmann, 1999).

Kellert (1996), highlighted four variables that influencing attitudes toward biodiversity: (A) values toward biodiversity affecting perceptions about a species; (B) physical and behavioural characteristics of an animal i.e. perceived intelligence, cultural associations; (C)

knowledge and understanding of a species, including factual, conceptual and conservation awareness (D) past and present interactions, including conflicts, recreational use and management status.

Several models explaining environmental behaviour have been developed e.g. Fietkau & Kessel's (1981) model of ecological behaviour. However the 'Model of responsible behaviour' (Hines *et al*, 1986/7) (see figure. 1.2) is interesting when applied to this projects' awareness campaign as it outlines six variables shaping intentions and influencing behaviour:

1. Familiarity with issues; i.e. knowledge of threats to saiga survival.
2. Knowledge of action strategies; what people can do to help conserve the saiga population.
3. Locus of control; perception that individuals' actions will impact on conservation.
4. Attitudes; a positive attitude towards saiga leading to a desire to protect them.
5. Verbal commitment; an expressed commitment to help/join a saiga club/donate money/educate others etc. indicates the likelihood of adopting pro-environmental behaviours.
6. Individual sense of responsibility; those with a strong sense of responsibility will adopt pro-saiga behaviours.

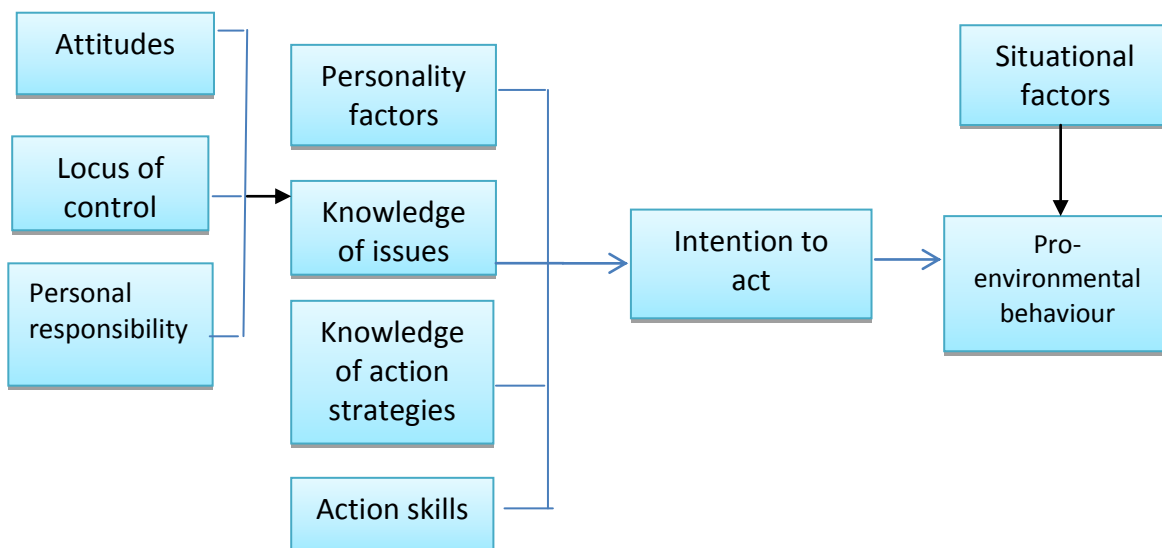


Figure 1.2 Model of responsible behaviour (Hines *et al*, 1986/7)



### **1.3. Environmental education as a conservation technique**

EE has played a pivotal role in conservation since Tbilisi, with amongst others, Hugerford *et al*, (1980) and the North American Association for Environmental Education (NAAEE, 2000) developing EE frameworks. Notably, The Society for Conservation Biology's framework states that EE plays an integral part in teaching people how to live in harmony with nature; playing a part in everyday life (Trombulak *et al*, 2004).

In 1992 The United Nations Conference on Environment and Development (UNCED) launched five agreements at the Rio Summit, notably (UN, 1992, Agenda 21, chapter 36) to promote public awareness and training, and the Convention for Biological Diversity (CBD) which promotes public awareness and education (article 13). Significantly, the CBD adopted a programme for 'Communication, Education and Public Awareness' (CEPA) to:

- 'Communicate the scientific and technical work of the convention in a language that is accessible to many different groups.
- Integrate biodiversity into education systems in all parties to the convention.
- Raise public awareness of the importance of biodiversity to our lives as well as its intrinsic value' (CBD, 2002).

In its Darwin Initiative the Department for Environment, Food & Rural Affairs (DEFRA), states environmental awareness and education as one of the four priority areas that projects are invited to focus on. Thus far 84% of all projects incorporate an element of communication with increasing numbers taking up CEPA activities (DEFRA, 2007).

Studies indicate that there may be positive correlation between knowledge, attitudes and pro-environmental behaviour (Infield, 1988; Lyons & Breakwell, 1994; White & Jacobson 1994). Howe (2009) investigated the role of education as a tool for environmental conservation, sustainable development and the influence of attitudes and knowledge thereupon. There is a dearth of literature regarding a positive link between environmental knowledge, attitudes and pro-environmental behaviour, especially where pro-environmental behaviour may be affected by other factors e.g. culture, personality and socioeconomics (Bride, 2006; Beldon *et al*, 1996, 2002). This highlights the importance of this study in

understanding how these links can help predict attitudes and behaviour in respect to public knowledge of conservation issues.

#### **1.4 Learning: an emotional experience**

Theories of learning are taking greater account of the role of emotion in this (Eich & Schooler, 2000). Moderate emotional arousal produced by novel, surprising, complex or ambiguous stimuli may result in curiosity and exploratory behaviour (Csikszentmihalyi & Hermanson, 1995). Emotion is important to recall, as the emotional aspects to the activity will promote memory (Sylwester, 1994). EE campaigns which promote emotional engagement have proposed that its use may contribute to achieving EE goals (Ballantyne *et al*, 2001a; 2001b; 2001c), highlighting the importance of projects such as this evaluating the emotional engagement of the target group.

#### **1.5. The target audience**

Attitudes about the environment develop at an early age (Bryant & Hungerford, 1977), have a strong influence on behaviour and are not readily changed (Asunta, 2003). Educators propose that targeting children over adults with EE campaigns is beneficial for several reasons; formal EE can be well targeted at a 'captive' audience at school (Shin, 2008), children are less likely to have well established harmful behaviour, educators have a long duration to influence their attitudes and children can be effective multipliers of information (Leeming & Porter, 1997). The Millennium Ecosystem Assessment (MEA, 2005) encourages targeting children with EE as they are to inherit the compromised planet and may be most concerned about the environment (Van Liere & Dunlap, 1981; Arcury, 1990).

Additionally, children may influence parental decisions e.g. in consumer choices (Cheek & Burch, 1976), research in EE suggests children can influence parents' environmental awareness and actions (Kruger, 1992; Sutherland & Ham, 1992; Uzzell, 1994, Damerell, 2009). This 'intergenerational influence' (Uzzell, 1994) sees young people acting as a catalyst for environmental knowledge among parents and the community.

For example, Ballantyne *et al*, (2001) found that an EE campaign brought about positive attitude changes in households through an intergenerational influence. Damerell (2009) found that parents whose children participated in wetland work, EE and discussed their experiences had greater knowledge than parents who did not. However, studies such as Damerell's often lack baseline measures for knowledge, attitudes and behavioural intent, and do not report the amount of knowledge transferred, limiting the extrapolations from the study findings.

Many conservation projects are unable to wait for children to grow up and to observe any implemented change, so EE targets adults able to instigate immediate change. Although the target audience is harder to reach, the few campaigns evaluated have demonstrated success. For example, Blumer & McQual (1986) found adults' knowledge about political parties rose and attitudes changed prior to an election through exposure to party political broadcasts. Here important factors to changing attitudes were existing knowledge and free-choice in seeking the information.

Rare's 'Hunchun Pride' campaign in Eastern Asia targeted adults with an EE campaign regarding challenges that tigers face. The campaign increased knowledge (that snares harm tigers), from 37% to 94%. Attitudes were correlated with behaviour, as the percentage of villagers selling tiger meat fell from 22% to 4%, and hunting activities from 52% to 18% (Rare, 2010).

## **1.6. Measuring success**

Success can be viewed as the achievement of stated objectives and outcomes, all too often in conservation these desired outcomes are implicit, based on an organisation's own particular, subjective value system, assuming that success has been reached when the project fulfils these goals (Salafsky *et al*, 2002; Axford *et al*, 2008). Without clarity regarding the specifics of a project's aims and their evaluation, narrow outcome data may be produced regarding valuable aspects of a project's effectiveness e.g. how a local community received a project, perhaps integral to long-term success. This may overlook the views of a variety of stakeholders and impact on the planning and implementation of successful future projects.

Feuerstein (1986) noted that a project aimed at increasing levels of sanitation in a village by building secure brick outhouses was deemed a failure, as they contributed little to village sanitation. However, as their houses had no locks villagers used them to store valuables in hence rating the project a success. Feuerstein illustrates how culturally and context specific the definition of success can be and how, attempting to measure success according to the projects initiators overlooked the communities perceptions of this as being successful.

The South Pacific Biodiversity Conservation Programme, funded by the UNDP, supported 17 community conservation area projects over 10 years. Measuring success against the projects original objectives identified some local successes, however overall the programme failed to meet its objectives (Baines *et al*, 2002). However, many people in the regional conservation community disagreed suggesting there can be differences in formal and intuitive evaluations of success and of non-formalised objectives that develop during a programme.

This raises the question of whether as success is so hard to define and has to consider the views of so many stakeholders can projects ever be objectively evaluated and if so, how can this be carried out taking into account different perceptions of success alongside biological and social indicators?

### **1.7. Programme evaluation**

Programme evaluations taking into account biological and social indicators of success are scarce in conservation literature. Clarke & Brunner (1994) note that they should measure success against meeting stated aims, objectives and outcomes. Additionally, project performance and decision making should be evaluated and recommendations and findings made available to relevant audiences.

Data shows that even though billions of pounds are channelled into conservation every year, biodiversity is still in decline (IUCN, 2005). Redford & Taber (2000) suggested that conservation lacks a culture in which critical evaluation of outcomes is seen as desirable; with concerns about highlighting shortcomings to stakeholders acting as a barrier. Pullin & Knight (2001) note that to date conservation science has not developed effective principles to ascertain what does and does not work and why. Yet without evaluation how will organisations know if their actions are slowing this decline?

A review of the literature investigating the success of EE campaigns highlights a lack of documented evaluations; Norris & Jacobson (1998) found that of 37 conservation projects less than a third included a system for formal evaluation of effectiveness and impact, nor processes for using this information to adapt their strategies. While in an analysis of 56 tropical conservation programmes, they found that fewer than half achieved their goals; interestingly one attribute correlated with programme success was the use of evaluation to continuously adapt the project.

Drawing from commentators such as Bitgood (1996), Tyler (1991) and Salafalsky *et al*, (2001), evaluations are essential and should allow conservationists to:

- measure success and allow monitoring of progress, to act as an early warning system
- find unexpected outcomes
- identify strengths and weaknesses, facilitating better programmes, decision making and adaptive management
- analyse programmes from a cost-benefit perspective
- impact future programmes through gaining an understanding of the effects of the programme on different audiences
- test the relevance and validity of the programme's defining principles
- share best practice and lessons learnt
- generate credibility
- promote confidence amongst key stakeholders.

In the current economic climate budgets and funding are being dramatically reduced, pressurising conservation organisations to spend wisely, especially as funders are increasingly looking to understand what impact their donation has achieved. Notably, in 1995 the USA passed a law stating that all federally funded agencies must report yearly on performance metrics and documented outcomes, the private sector soon followed suit.

Evaluations can be costly and difficult to administer (Clarke, 1996a). In addition, they are often run over a short time-frame as projects have strict timelines, often before environmental benefits can be seen. Significantly, it is not always clear whether change is the result of an intervention.

It is essential for conservation to ask of its evaluations not only 'How well are we doing? But 'Does it make sense to do it even if it is being done well?' (Leeuw *et al*, 1994). Aims and objectives of programmes must be stated at the outset, enabling criteria for success to be developed. Evaluations should have a clear feed-back mechanism to enable adaptive management; whereby the learnings are combined with design, management and monitoring to test all assumptions to successfully adapt future projects (Salafsky *et al.*, 2001). Additionally, evaluations should be fed-back to the community so that they understand how their involvement has led to the project's outcomes.

EE programmes take place in a variety of cultures and environments, hence contextual factors must be taken into account thus assessing the possible misattribution of external (campaign influence only) values (Fien *et al*, 2001). Additionally, differences in local socio-demographics etc. must be considered, for example Powers (2004) found that results of point-gains on school field trips were doubled for children from higher socio-economic backgrounds.

Local cultural context may have an effect on conservation outcomes, hence interventions need to take time to incorporate these nuances into their plans (Brechin *et al.*, 2002; Peterson *et al.*, 2010). An understanding and engagement with local institutions, such as working with local government agencies; in the case of the current project, may give an intervention more chance of success (Waylen *et al.*, 2010).

Evaluation led Fernandes (2006) to discover that the education and awareness campaign to protect the Arapaima gigas fish in Guyana appeared to have influenced social norms, and was the main contributing factor in the emergence of a conservation ethic in the community, resulting in informal social pressure that was more effective in stopping over fishing than formal mechanisms. This highlights the importance of understanding local culture and targeting local government and informal social mechanisms; Fernandes proposes that this is critical when formal institutions are inappropriate or slow to develop; without in-depth evaluation of outcomes discoveries such as this are overlooked.

Traditionally, most evaluations have focussed on biological/ecological indices of success, however, good evaluation programmes should also take into account social criteria such as public support, attitudes and knowledge of key stakeholders, and trends in these key

variables (Reading & Kellert, 1993). It is important to note that these evaluations are often carried out by external agencies and hence encounter barriers such as language and cultural differences etc. perhaps leading to subjective and erroneous interpretation of findings.

Choosing which method to employ depends on the purpose of the evaluation and available resources (Kleiman *et al*, 2000). Methods of evaluation may include; moderated workshops project team members or individuals affected by the project, case-study analyses of individual conservation initiatives and meta-analyses for comparative examinations across of a number of sites (Saterson *et al*, 2004). Comparative evaluations may require collaboration between both natural and social scientists to gain the required perspective to synthesise and integrate the findings (Saterson *et al*, 2004). Where possible, quantitative and qualitative approaches to data collection should be employed to obtain the depth and range of information required to truly evaluate success (Browne-Nunez & Jonker, 2008).

#### **1.7.1. Outputs versus Outcomes**

Sheppard (1999) proposed that conservation must move from a system of evaluation replacing 'What have we done to accomplish our goals?' (Outputs) with 'What has changed as a result of our work?' (Outcomes).

Conservation has drawn from other sectors to find and develop evaluation methodologies. One such framework LOGFRAME (US Department of Defence) was developed to plan, monitor and evaluate programmes; it has been adopted and developed by USAID, the UK's Overseas Development Authority and other overseas agencies. It provides a tool to analyse a project's component elements and logical linkages between inputs and objectives.

Notably, large organisations such as the Nature Conservancy and the United Way of America have developed frameworks to evaluate success, focussing on key ways to measure outcomes. See figure 1.7.1.

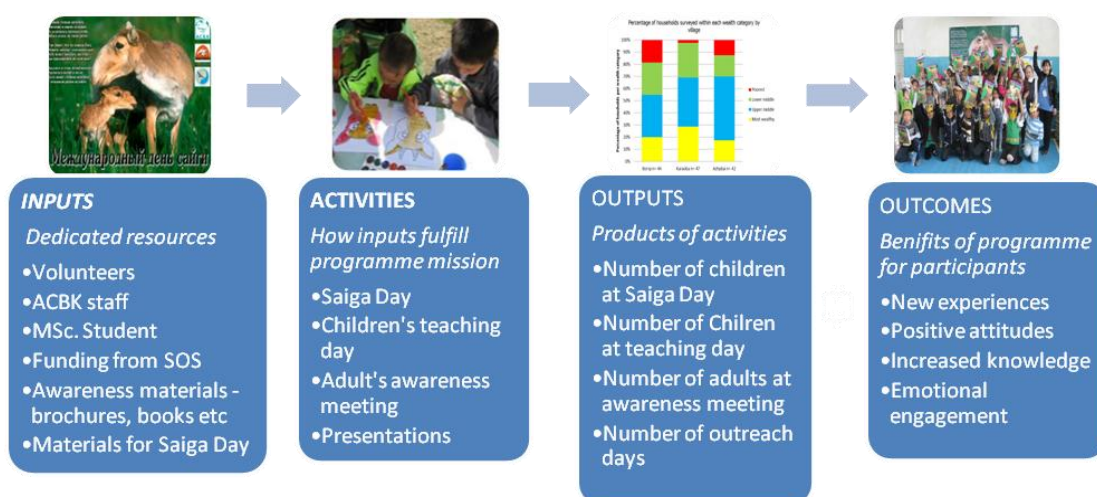


Figure 1.7.1 Framework to evaluate success. Adapted from United Way Evaluation Model (1996).

### 1.7.2. Indices of success

As organisations realise the benefits of evaluating outcomes as well as outputs, several frameworks identifying indicators of success and evaluating programmes have been developed. The Nature Conservancy's Five Step 'Conservation by Design' Framework promotes evaluation of projects against clear targets. While The Biodiversity Indicators Partnership has developed a suite of indicators against which parties to the CBD can judge their progress in meeting targets.

Measuring outputs is relatively easy, yet does not provide information regarding the process and challenges of programme implementation or the local community's active engagement in the project, which is essential for its success. To evaluate this vital component we need to measure outcomes.

As most programmes, including the saiga awareness campaign the present study focuses on, aim to change behaviour, it is necessary to find proxies for behavioural intent as observing intended behaviour may be unobtainable for various reasons e.g. time-scales and budget (Holmes 2003).

In situations where assessing behavioural change is difficult attitudes can be useful surrogates (Infield & Namara, 2001). However, some commentators (Triandis, 1980; Holmes,



2003) disagree proposing other factors as potentially more influential; the more a behaviour is previously engaged in, the less important intention or attitudes are in predicting future behaviour (Triandis, 1980).

Songer-Nocks (1976) and Fazio & Zanna (1978) found that behavioural intent formed by direct experience with the behavioural object can increase the intention-behaviour relationship. They state that direct experience or contact is more salient in memory.

As Ajzen's TPB (1991a) indicates that intention, formed by attitudes, is the best predictor for behaviour, it is pertinent to use a Contingent Valuation Method (CVM), in this instance Willingness to Pay (WTP) in the current study. WTP is controversial amongst some theorists, as it is based on potential, as opposed to observed, behaviour. Horton *et al*, (2003) state that at worst it gives results based on guesswork where respondents are exhibiting their need to support a worthy cause, and at best WTP is a crude estimate to subjective valuations and inclinations. Furthermore, it ignores other non-monetary variables which predict behaviour such as voluntary work, (especially important in low-income, developing countries). Finally, care must be taken when using WTP to implement actual monetary regulations, as studies have shown that correlation between attitudes and behaviour is greater the smaller the time lag between questioning and action (Sheth, 1973). This thesis therefore also evaluates non-monetary variables in a willingness to help (WTH) scenario.

WTP has been well established as a measure of behavioural intent in conservation (Mitchell & Carson, 1989), many economists and conservationists who use WTP incorporate attitudes of respondents in their economic models to improve their descriptive and predictive nature (Lynne *et al*, 1998). Notably, attitudes formed with prior information (in this case EE) when people have been engaged in thinking about the object, are stronger than those formed without, hence may be better predictors of behaviour (Millar & Tesser, 1990). WTP as a measure of success may help explain the accomplishments of the campaign by measuring attitude change as well as allowing for examination of reasons for bids (Howe, 2009).

It is essential to measure the influence of social and economic factors impacting attitudes, WTH and WTP (Holmes, 2003), taking into account explanatory variables such as age (Horton, 2003), gender and wealth (Poe *et al*, 2000; Hanley, 2008). Also does the process

and experience of taking part in the campaign impact WTP/WTH as postulated in studies (Rossi *et al.*, 1999).

## 1.8. Project background

### 1.8.1. Saiga – a population in decline

The saiga antelope is a migratory ungulate living on the dry and semi-desert steppe of Central Asia and Russia. There are two sub-species: *S. tatarica tatarica*, found in Kazakhstan, Russia, Uzbekistan and Turkmenistan; and *S. t. mongolica*, which is found in Mongolia. See figure 1.8.1.

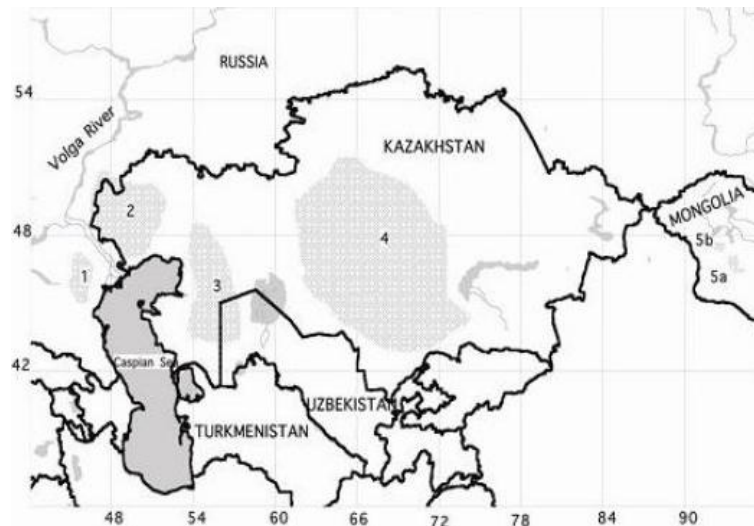


Figure 1.8.1 Saiga populations distributed in Kazakhstan. 1. Pre-Caspian, 2. Ural, 3. Ustiurt, 4. Betpak-dala, 5. Mongolian (Milner-Gulland *et al.*, 2001).

The saiga is often called a ‘relic of the ice age’ as one of the last remaining herbivores of the Eurasian grass-lands. It once roamed in herds of up to 100,000. However, since the collapse of the Soviet Union in 1991 the population has faced rapid declines (figure 1.8.1a), with a 90% decrease to 178,000 in 2000 (Milner-Gulland *et al.*, 2001). The saiga population in Kazakhstan alone has fallen from 825,000 to 102,000 in 2010. The Uralsk population, with which the present study is concerned, fell from 236,000 in 1991 to 17,948 in 2011 (SCA, 2011).

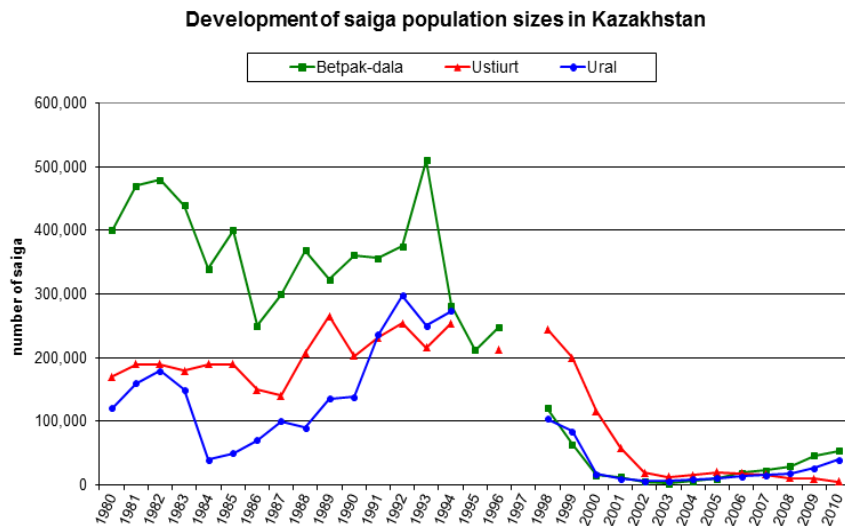


Figure 1.8.1a Development of saiga populations sizes in Kazakhstan, The Institute of Zoology, Almaty (Personal communication, 2011).

This decline prompted the IUCN to reclassify the population as critically endangered in 2001 and in 2002 the Convention on Migratory Species (CMS) listed the sub-species Saiga on CMS Appendix II; since 2008 the entire species has been listed in CMS Appendix II (CMS 2008). Notably, in 1995 saiga were listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Additionally, in 1996 the CMS issued a Memorandum of Understanding to facilitate implementation of these agreements. The government of Kazakhstan also implemented its own protection measures and in 2005 launched the ‘Programme for conservation and restoration of rare and extinct ungulate animal species and saiga’.

### 1.8.2. Current threats

Saiga populations undergo periodic crashes, mainly caused by severe climatic conditions or dzhuts, during which up to 40% of the population may die (Bekenov *et al.*, 1998). Other causes of mass mortality are diseases such as Pasteurellosis which reduced the Ural population from 150,000 to 40,000 in 1984, occurring again in 2010 and 2011.

The dissolution of the Soviet Union and subsequent collapse of the economy, withdrawal of subsidies and break-down of the welfare system has led to mass unemployment and poverty throughout Kazakhstan. Additionally, there has been a withdrawal of state funding for

nature protection. These factors have seen a dramatic increase in the other main threats to the survival of the species; poaching for meat and the horns of the male saiga. This targeting of mainly males has led to heavily skewed sex ratios and population collapse (Milner-Gulland, 1994).

The World Bank (2011), places Kazakh gross national income at \$7,440 per person per annum. Additionally, unemployment figures stand at seven per cent (UNDP, 2009), unofficial figures suggest this may be nearer 20-30% (Olcott, 2010). Official figures may be lacking data due to minimal uptake of state-run employment agencies. Furthermore, 17.8% of Kazakhstan's population is 'poor' according to the Human Development Index (CIA, 2011). The target area of West Kazakhstan has the country's highest unemployment rate of 7.1% (RK Agency, 2011).

In 2005 saiga hunting was prohibited in Kazakhstan, nevertheless, since 1995 Kazakhstan has exported 31,323 kg of saiga horn; (19,000 kg being exported to China in 2001) (Von Meibom *et al*, 2010). The horns fuel demand for ingredients for the Chinese medicine trade where it is used in over 2,000 products.

The CMS (2010a) noted that little work had been done on anti-poaching and the illegal trade in saiga products and recommended the strengthening of anti-poaching activities such as law enforcement and legal systems as crucial and immediate activities. Additionally, a CMS working group (2010b), noted that use of saiga in Traditional Chinese Medicine become a priority area for research and enforcement.

One kg comprises 5/6 horns (Sokolov & Zhirnov, 1998). With rural unemployment high and one kg of horn fetching \$180 (which is then sold on in Singapore for \$877) (Von Meibom *et al.*, 2010), poaching may be seen as an attractive way to make money. Few effective access and benefit regulations means ownership of the saiga may be viewed as unclear, encouraging an environment reminiscent of Hardin's Tragedy of the Commons (1968), stimulating a race to harvest the 'profits' before the next person.

### **1.8.3. Cultural and ecosystem Importance**

The saiga is regarded as a keystone species in the steppe ecosystem (SCA, 2009). Their grazing of the steppe maintains vast areas of vegetation preventing invasion of weeds and providing habitat for many bird species. The saiga itself is a prey base for several raptor species as well as wolf, *Canis lupus* and fox, *Vulpes vulpes*.

Until the collapse of the Soviet Union in 1991 saiga were legally and sustainably hunted for their meat, skin and horns. Since then there has been a lack of funding and infrastructure to enforce the hunting ban imposed. Additionally, the collapse in the economy, dissolution of communal farms, high unemployment and decline living standards has led to increased poaching for the saiga horn (Milner-Gulland *et al*, 2001), fetching up to \$600 per kilogram on the black market in the 1990s (Mallon & Kingswood, 2001).

Saiga hold a revered place in Kazakh culture. Appearing in anything from ancient fairy tales to statues found in town square fountains. These communities regard the saiga as a symbol of the steppe; culturally important and interwoven with their own nomadic past.

### **1.9. Building public engagement – A campaign to build public awareness of saiga in Kazakhstan**

Having ratified the CBD in 1994, 1997 saw the adoption of ‘Kazakhstan’s 2030 Strategy’ and development of long-term goals to implement EE. In 2001, the Aarhus convention paved the way for non-governmental organisations (NGOs) such as the ACBK, to engage in EE and access Kazakhstan’s environmental information to participate in relevant issues and policy making.

The studied campaign was the first collaboration between the SCA (overseeing the project and funding) and the ACBK (providing expertise on the ground). The aim of the NGOs’ project was to build a constituency of public support for, and awareness of, saiga conservation in Ural.

### 1.9.1. Target area

The CMS (2010a) has prioritised public engagement as a crucial and immediate priority in its medium term work programme for the saiga in Kazakhstan. As no public outreach for saiga had been carried out in this western region of Kazakhstan before, the local concern following the mass die-off in May 2010 offered the perfect opportunity to mobilise public support for saiga conservation.

Three villages were chosen to target for interviews with local people, see figure 1.9.1. One where poaching is known to occur regularly (Azhylbai), another where little to no poaching has been reported (Karaoba), and a third located close to the die-off area (Borsy).

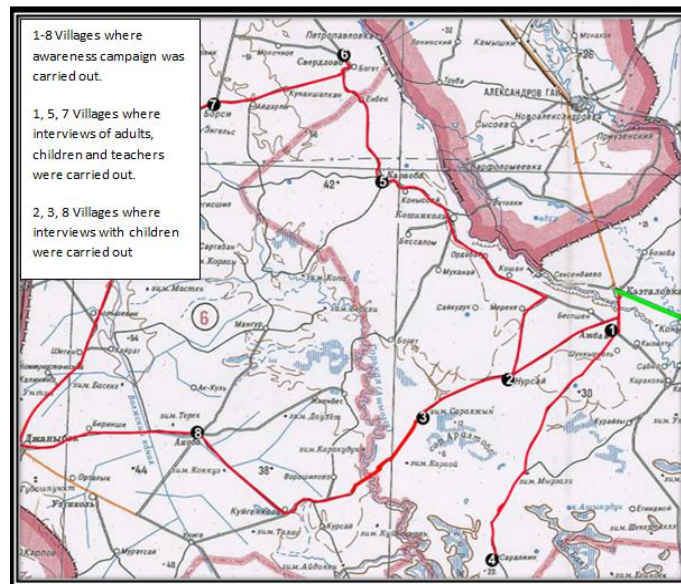


Figure 1.9.1: Awareness campaign target villages (SCA, 2010).

### 1.9.2. Target audience

The awareness campaign's primary target audience were school children in the target villages between the ages of six and eleven and adults in the same villages.

### 1.10. Project activities

The campaign comprised four phases implemented over six month period from January to June 2011:

#### Phase 1 Initial questionnaire (pre-campaign measure)

This comprised of open and closed questions, combining quantitative and qualitative research methodologies. The questionnaire completed with 133 local villagers, aimed to ascertain baseline knowledge of saiga, demographic and background information such as participants' status, as well as to ascertain their attitudes and behavioural intent towards saiga. This was administered in three villages by ACBK students in January 2010.

**Phase 2 Public outreach**

- i. Awareness campaign\* – this comprised an evening of presentations targeted at local adults in each village, delivered by local government and ACBK staff. They were shown cartoons, a short documentary and were given saiga awareness material (e.g. brochures and pamphlets) and had the opportunity to ask questions. This aimed to provide information on the mass die-off, the ecology and conservation status of the saiga.
- ii. Saiga education day\* – local school children were shown saiga cartoons and told about the challenges the saiga face, discussions with teachers and ACBK students also took place. i and ii took place in late January 2011.

**Phase 3 Saiga Day\* (May 2011)**

Aimed at school children (6-12 years old) and took place in each village's school. The day comprised several children's activities e.g. reading poetry children wrote about saiga, drawing and colouring, and saiga related games and activities.

**Phase 4 Follow-up questionnaires (post campaign measure / evaluation)**

Carried out in June 2011 targeting the original villages to ascertain adult exposure to the awareness campaign, new information learnt, and changes in attitudes and behavioural intent. Children were also interviewed to assess their knowledge, attitudes and experience of Saiga Day.

- \* Educational materials were not specially produced for this campaign, it utilised previously developed SCA/ACBK materials, piloted and refined in other regions.

## 2. Methodology

### 2.1. Theoretical framework

The theoretical framework of the TPB (Ajzen, 1991) was used to develop research aims of this study, see Figure 2.1 and 2.1a. The ideal would be to measure the impact of the awareness campaign on each of the elements of the TPB model. However, due to time constraints the present study is only able to report on attitudes towards saiga conservation, how people feel they can actually help, and how these factors, in addition to explanatory variables such as age and gender, impact on behavioural intent. (Measured through WTP and WTH).

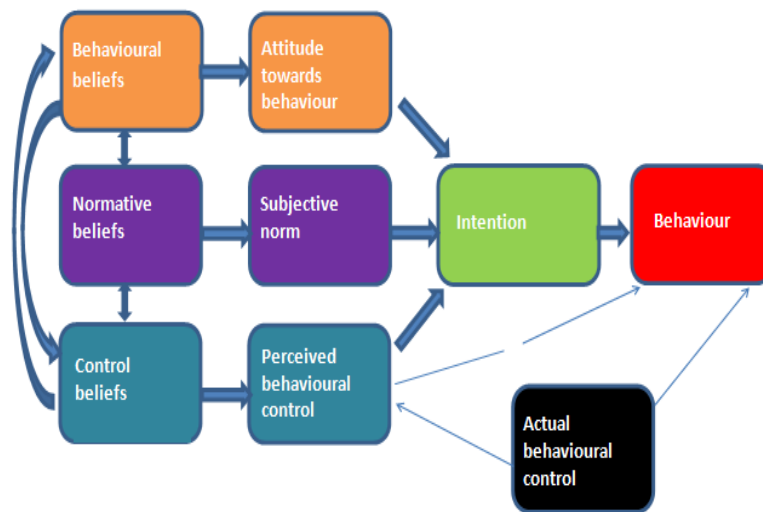


Figure 2.1 Ajzen's (1991) Theory of Planned Behaviour

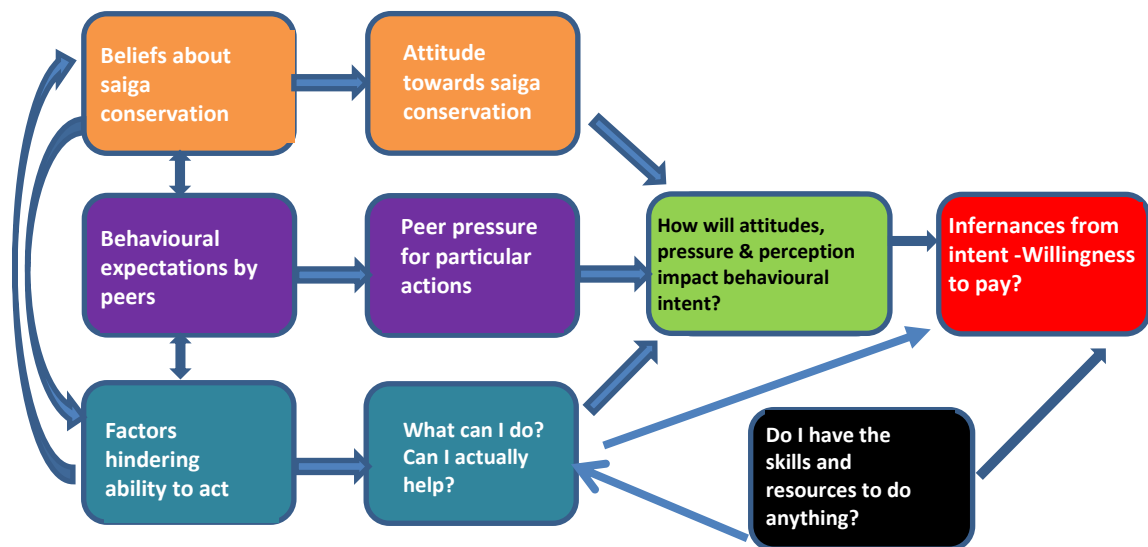


Figure 2.1a Ajzen's (1991) Theory of Planned Behaviour has been adapted for this study



### 2.3. Hypotheses

After reviewing the relevant literature, three positive one tailed hypotheses were developed, as per table 2.3.

Table 2.3. Hypotheses and supporting arguments

Hypotheses	Examples of supporting arguments	References
<p><b>H1.</b> Participants' increased knowledge since programme inception has led to more supportive attitudes and behavioral intent towards saiga conservation.</p>	<p><sup>1</sup> Increased knowledge leads to increased pro-environmental behaviour.</p> <p><sup>2</sup> Studies indicate that increased knowledge, may lead to more positive attitudes, which may result in pro-environmental behaviour. This is also reflected in the TPB model, whereby each element impacts the subsequent element which culminates in behaviour.</p>	<p><sup>1</sup> Bradley <i>et al</i>, (1999)</p> <p><sup>2</sup> Infield (1988) Lyons &amp; Breakwell (1994) White &amp; Jacobson (1994) Ajzen (1991)</p>
<p><b>H2.</b> Increased exposure to saiga and favourable socio-economic situation lead to positive behavioural intentions.</p>	<p><sup>1</sup> Exposure to species is one of the four key variables which help form pro-environmental attitudes</p> <p><sup>2</sup> Using WTP as a proxy for behavioural intention will show if the campaign has resulted in more positive intentions – although WTP is not a perfect indicator as is wealth dependant, and hence to be controlled for, using WTH as a proxy for behavioural intent.</p>	<p><sup>1</sup> Kellert (1996) Songer-Nocks (1976), Fazio &amp; Zanna (1978)</p> <p><sup>2</sup> Mitchell &amp; Carson, (1989), Horton <i>et al</i>, (2003), Howe, (2011), Rossi <i>et al</i>, (1999)</p>
<p><b>H3.</b> Exposure to and positive of experiences of the campaign may result in greater knowledge, positive attitudes and increased pro-saiga behavioural intention.</p>	<p><sup>1</sup> Campaigns which promote positive emotional engagement, such as during saiga day, are thought to support the achievement of EE goals.</p> <p><sup>2</sup> Literature from psychotherapy regarding the use of cognitive behavioural approaches to promote changes in cognitions and behaviour suggests active participation and collaboration with an awareness campaign may encourage self-efficacy, empowerment and subsequently change.</p>	<p><sup>1</sup> Ballantyne <i>et al</i>, (2001a; 2001b; 2001c)</p> <p><sup>2</sup> Beck, (1995)</p>

## 2.4. Participants

Two distinct audiences were targeted in three villages to obtain as wide a range of attitudes and behaviour and produce as representative a sample and results as possible (table 2.4).

Adults were interviewed pre and post EE using a structured questionnaire; designed to investigate attitudinal and behavioural changes. Children were only interviewed post-campaign due to project limitations; hence this group could only provide feedback on experiences of the campaign.

Target audience	Village	Total respondents	Male	Female	Age range
Adults	Borsoy, Karaoba, Azhybai	255	132	123	16-60+
Children	Borsoy, Karaoba, Azhybai, Nursai, Akoba	89	52	37	5-11

Table 2.4. Overview of respondents in target villages.

## 2.5. Design

A Quasi-Panel design was utilised, allowing two different sets of respondents to be studied at two different time points (de Vaus, 2002). Using two different groups of respondents avoided the problems associated with tracking the same people over time. This is pertinent as the second questionnaire was executed in the summer, when villagers are often absent due to distant grazing of cattle. Subsequently, care was taken to ensure a spread of ages and gender to avoid collecting a biased sample. This design also enabled the data to be anonymous ensuring confidentiality, data was kept in a secure place.

### 2.5.1. Rationale for choosing questionnaires

Structured interviews were chosen as the method of data collection to avoid inconsistencies that accompany informally gathered data, they are repeatable and easily analysed, topics are not missed, and several interviewers can implement the interviews at the same time.

Many of the questions in this study are quantitative, some using a Likert scale, giving both direction and strength of attitude (de Vaus, 2002). Subsequently, answers could be easily coded, making interviews quick to administer, easily replicable and quantifiable without bias, it also offers low influence from interviewer bias and is highly reliable. However, Poe *et al*, (1988) propose that they force respondents to choose a category that does not represent their true opinion, necessitating careful piloting to ensure the range of opinion is properly captured.

For this project quantitative data allowed statistical analyses to be carried out on outcomes such as the relationship between attitudes and behavioural intent. It also allowed incorporation of other variables such as knowledge, experience of campaign, demographic data and interactions with saiga. Previous questionnaires conducted with adults in January could then be used as a baseline for comparison with the second round of data.

Questions comprised those in Likert scale format and closed questions, however, as this type of question restrains respondents' answers the range of information that can be gathered is narrow, hence open ended questions were also used; where respondents were not bound by fixed answers. Here the interviewer has some flexibility in responding to different trains of investigation. Qualitative questions can be problematic; with interviewers often lacking training in interview techniques and time constraints leading to unreliable notes where context and details are overlooked. Qualitative data is also more open to being 'lost in translation' subjective judgements may be made when translating leading to misinterpretation or loss of meaning. (This was at times found in the present study despite requests to answer as fully as possible). However, qualitative answers do not have to be coded offering rich, in-depth data where respondents convey their feelings and can elaborate.

The primary disadvantage of orally administered questionnaires are possible response effects, here data are potentially biased due to respondent or interviewer characteristics (Bernard, 2002) and may encounter false responses in a socially desirable direction (Locander *et al.*, 1976).

Word *et al.*, (1974) found that ethnic group can impact interviewing behaviour, creating interviewer bias. In their study white researchers interviewed both white and black

respondents, but found that a higher immediacy, more eye contact and more favourable results were gained when researchers interviewed respondents of the same ethnicity. Consequently, all interviews in the present study were conducted in Kazakh or Russian by trained local students. However, my presence may have impacted upon the interviews I attended during the second round of data collection although it is not possible to fully ascertain what influence this may have had.

Establishing a rapport is essential, especially when working with children, who can be more inhibited with strangers. Therefore icebreaker exercises and small gifts (e.g. pens and badges) which encouraged communication, were employed (Theis, 1996) (figure 2.5.1).



Figure 2.5.1. Ice-breaking activities with school children before the interviews.

Pre and post campaign interviews were administered in exactly the same way, by the same interviewers, so that a baseline could be taken, and any subsequent changes in attitudes and behaviour between the groups could be correlated with the campaign. However, there are drawing causal inferences is limited as there was no counterfactual group without exposure to the campaign with which to measure findings against (Ferraro & Pattanayak, 2006). Additionally, using this method means that other factors, not just the campaign, may be the reason for change, eg. my presence during interviews, the fact that we did not interview

exactly the same people again, the potential of receiving information via the media, hence it is important to try to capture as many variables as possible. Finally, the present study cannot be certain to measure ‘actual’ change as it does not measure matched pairs, although we have a baseline of variables we are not capturing an individual’s baseline and post campaign change, and it is important to note that although the groups were matched as closely as possible there will be some variation. See table 2.5.1.

Table 2.5.1. Matching respondents’ ages, gender and wealth pre and post-questionnaires.

		Baseline	Post campaign
Respondents	Karooba	47	43
	Borsoy	44	42
	Azhibai	42	40
		<b>133</b>	<b>125</b>

		Baseline	Post campaign
Age	u20	4	7
	21-40	47	42
	41-60	65	65
	>60	17	13

		Baseline	Post campaign
Male respondents	Karooba	24	25
	Borsoy	25	23
	Azhibai	20	28

		Baseline	Post campaign
Female respondents	Karooba	23	18
	Borsoy	19	19
	Azhibai	22	12

		Baseline	Post campaign	
Wealth by village	Most wealthy	Karaoba	7	5
		Borsoy	8	7
		Azhybai	4	10
	Upper middle	Karaoba	20	18
		Borsoy	16	15
		Azhybai	22	15
	Lower middle	Karaoba	9	19
		Borsoy	16	16
		Azhybai	6	13
	Poorest	Karaoba	5	3
		Borsoy	2	4
		Azhybai	8	4

		Baseline	Post campaign
Wealth	Wealthiest	20	22
	Upper middle	58	48
	Lower middle	31	48
	Poorest	15	11

		Baseline	New total
Education	Higher	17	16
	Secondary	115	99
	Primary	2	10

**2.5.2. Development of questionnaire**

In order to compare baseline and post-campaign data, many original questions were repeated and some new ones added. Following Krosnick & Presser, (2009) and Sudman & Bradburn’s (1982) guidance that items at the beginning of a questionnaire may be likely to influence willingness to respond to the survey, sensitive questions were placed at the end of the questionnaire. Coolican’s (1994), 15 suggestions for writing successful questionnaires were followed; with questions designed to be non-leading, avoiding ambiguity and technical terms, etc. Additionally, when designing the questionnaire for children a clinical psychologist with a specialist interest in matters pertaining to children was consulted in order to ensure the language used was developmentally appropriate.

Questions were divided into sections to elicit responses pertaining to the research questions; these answers were later combined to facilitate statistical analysis. The first section of the questionnaire focussed on gathering attitudinal data, the second on demographic factors (Appendix 1: questionnaires).

### **2.5.3. Pilot study**

The ACBK reviewed the questions, suggesting changes as per their experience with the initial questionnaire; namely deleting questions focusing on income which was poorly answered and felt to be culturally inappropriate. They also suggested moving saiga-based questions to the start enabling development of rapport and a gentle passage to more complex questions. After this Peat's (2002) steps for administering pilot studies were followed, five children and five villagers were used in the pilot study, these were located in the first sample village, Azhybai:

- Respondents identified ambiguities and difficult questions, which were reworded for clarity. The children's questionnaire remained the same.
- The time taken to complete the questionnaire was considered reasonable at approx. 25 minutes.
- Pilot studies did not indicate problems with questions measuring adult's experiences of the campaign, yet it is noteworthy that many were not completed.

### **2.5.4. Procedure**

Household questionnaires: Opportunistic sampling in three streets of each village was carried out (table 2.5.4). Interviews were completed between 7 and 13<sup>th</sup> June. In order to target a wide range of respondents and reduce sampling bias they were completed at various times of the day.

Table 2.5.4: Percentage of village interviewed pre and post campaign

Village	Number of baseline interviews with adults	% of village interviewed for baseline	Number of post campaign interviews with adults	% of village interviewed post campaign
Azhybai	42	4.7	40	4.4
Borsoy	44	4.6	42	4.4
Karaoba	47	2.8	43	2.8
<b>Total</b>	<b>133</b>	<b>3.8</b>	<b>125</b>	<b>3.5</b>

Children's questionnaires: Completed between 7 and 13<sup>th</sup> June in local schools. Children were opportunistically targeted due to school holidays, hence the sample was limited to children attending a summer camp who had attended both the information and Saiga Days, (table 2.5.4a).

Table 2.5.4a: Percentage of children interviewed who attended Saiga Day.

Village	Total number of children interviewed	Children interviewed as a % of those who attended Saiga Day
Azhybai	42	4.7
Borsoy	44	4.6
Karaoba	47	2.8
<b>Total</b>	<b>133</b>	<b>3.8</b>

### 2.5.5. Data processing and analysis

In the absence of behavioural observation, willingness to pay (WTP) can be used as a measure of behavioural intention (Bateman *et al*, 2002; Howe *et al*, 2011). However, WTP may be a weak indicator of environmental behaviour as it is linked to wealth. Diekman & Franzen (1999), noted that when they asked people from poorer countries to rank problems, environmental issues are valued lower than others, however, when asked to rate the severity of problems, environmental issues rate highly. This highlights the scarcity of economic resources and not the lack of environmental concern amongst those with less wealth.

To ensure statistical power and reduce the likelihood of a type II error, stratification by wealth was used (Milner-Gulland & Rowcliffe, 2007). A post-hoc classification of wealth was assigned to each villager who were asked questions to assess their economic situation and then assigned a wealth classification based on asset scores (table 2.5.5). Wealth criteria were chosen based on Kühl, (2008) and Howe, (2009), and developed through expert opinion; one local academic, the ACBK team leader and three regional students with an understanding of the nuances of the local socio-economic environment. These five people jointly discussed each questionnaire and unanimously classified each respondent.

Table 2.5.5: Criteria used to allocate wealth categories.

Classification of wealth	Car ownership	Employment	Pension	Cow ownership	Sheep ownership	Horse ownership	People in household
Most wealthy	✓	≥ 2 fully employed household members	✓ in addition to Full-Time employment	≥ 5	≥ 20	≥ 1	3-5
Upper middle	✗	2 P-T or 1 F-T + 1 pension	✓ + one member in Part-Time employment	3-5 inc.	≤ 2	✗	4-6
Lower middle	✗	✗	✓	≤ 2	≤ 10	✗	4-7
Poorest	✗	✗	✓	1	✗	✗	4-8

Dependent variables were developed such as 'Saiga knowledge', 'Attitudes towards saiga', WTP and WTH. Explanatory variables such as 'Wealth', 'Experience of taking part in the campaign', 'Exposure to saiga' and 'Exposure to campaign' were all quantified according to answers given to predefined questions (table 2.5.5a). Additional explanatory variables include; Length of residence in village, village, education, employment, age and gender.



Table 2.5.5a Number and category of questions to ascertain explanatory variables within each audience.

	Adults initial questionnaire (number of questions)	Adults new questionnaire (number of questions)	Children (number of questions)
Exposure to saiga	6	6	3
Saiga knowledge	5	5	5
Exposure to campaign	n/a	2	n/a
Attitudes towards saiga	5	5	2
Experience of taking part in the campaign	n/a	7	5

Data analysis was conducted with Microsoft Excel and SPSS Ver. 19 (PASW) and included tests such as Kruskal-Wallis, Mann-Whitney U, Chi-Squared and Spearman's correlations.

### 3. Results

#### 3.1. Attendance data

Three per cent (n=132) of a possible target audience of 4400 adults attended the awareness events, 52% (n=69) of whom were interviewed. Of 992 children 46% (n=456) attended the EE day while 32% (n=318) attended Saiga Day. 19% (n=89) of children who attended both were interviewed. See table 3.1.

Table 3.1: Proportion of the target audience exposed to the awareness campaign in each village. Population data gathered from local government office or local school.

	Karaoba	Borsoy	Azhybai	Akoba	Nursai	Total	Percentage of population
Adults resident in the village	1302	839	683	726	850	4400	na
Total adults at awareness event	30	30	25	26	21	132	3
Total adults at saiga day	25	10	30	20	15	100	2
Pupils at the school	363	102	206	163	158	992	na
Total children involved in initial education event	65	100	100	130	70	465	47
Total children at saiga day	114	36	70	58	40	318	32
Pupils interviewed	19	19	17	22	12	89	28
Villagers interviewed	90	86	82	n/a	n/a	258	6

#### 3.2. Exposure to awareness campaign – Adults.

63/125 of the interviewees attended the awareness event; over half the attendees (33) were male, employed (30, n=48), aged between 41-60 (21, n=64), had a secondary education (27, n=64) and had lived in the village for more than 30 years (20, n=64).

Of those who did not attend the event (n=58) 13 received no information at all. Of those who did, 28/60 received information from the EE campaign alone, while the majority (31) received information jointly from the mass media and EE campaign. See figure 3.2. Reflecting findings that most respondents prefer receiving information via the mass media; (n=258; television 241, newspapers 227 and magazines 181), with only 44 getting information from talking to friends.

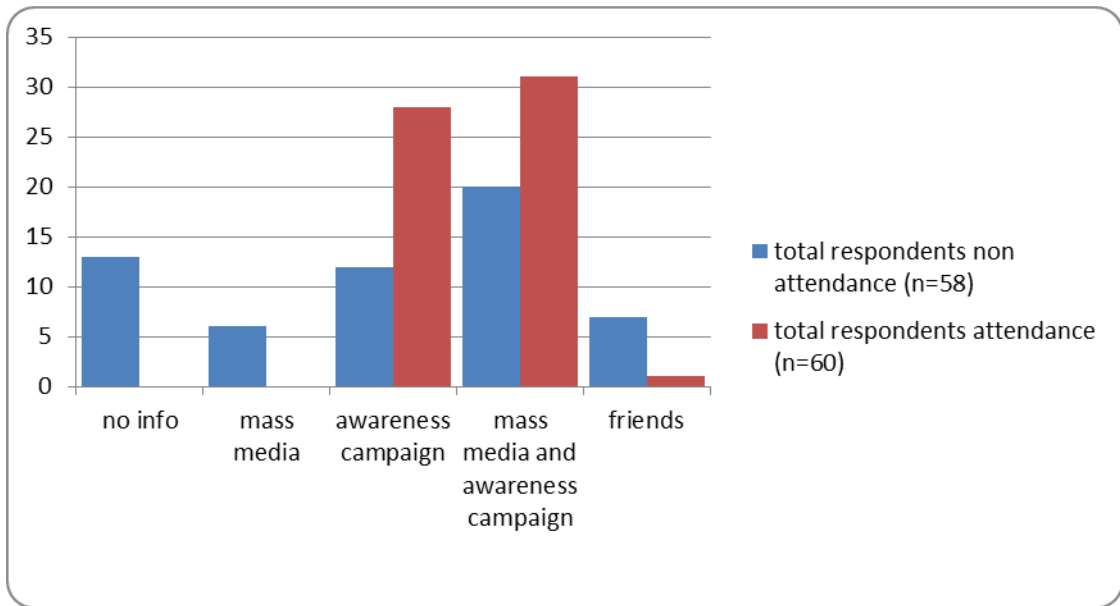


Figure 3.2: respondents who attended gained information from the mass media as well as the campaign, while those who did not attend gained information from a variety of sources

### 3.3. Knowledge

Post EE knowledge was significantly higher (Fig 3.3. Kruskal-Wallis,  $H(1) = 122.68$ ,  $N = 258$ ,  $P < 0.05$ ). This appears to confirm Hypothesis 1, in that the campaign has led to better saiga knowledge in the population as a whole. Post campaign respondents were 38% more likely than baseline respondents to report that they had all the saiga information that they felt they needed.

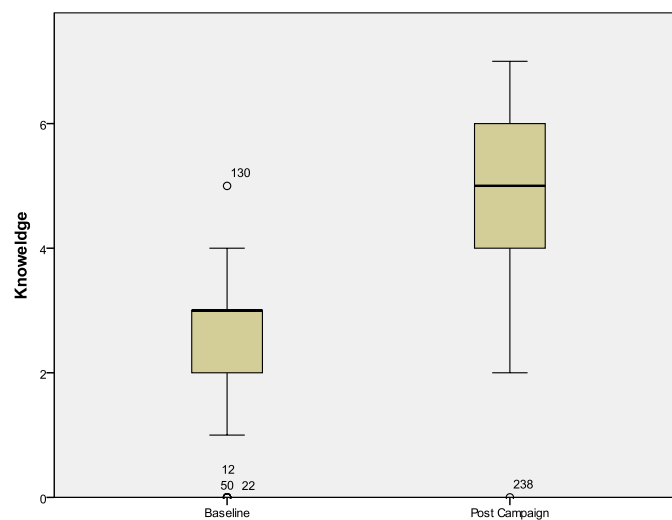


Figure 3.3, Box plot showing a significant difference between pre and post knowledge scores. Baseline data shows lower knowledge scores (Mdn=2) while post campaign data shows a median knowledge score of 5, with 95% confidence intervals

**3.1. Knowledge and exposure to campaign - Adults**

There was no significant difference in knowledge between people who did and didn't attend the awareness event. (Kruskal-Wallis,  $H(1) = 0.664$ ,  $N = 63$ ,  $P < 0.05$ ). There was significant difference in knowledge between people who were employed or unemployed. (Kruskal-Wallis,  $H(3) = 7.394$ ,  $N = 63$ ,  $P < 0.05$ ).

Respondents gained most knowledge from a combination of the mass media and the event, regardless of attendance (See figure 3.3.1). These may indicate that the EE event alone is not a strong vehicle for education purposes. Although people may not have experienced the awareness event first-hand they were still able to gain information from it via third parties and disseminated materials.

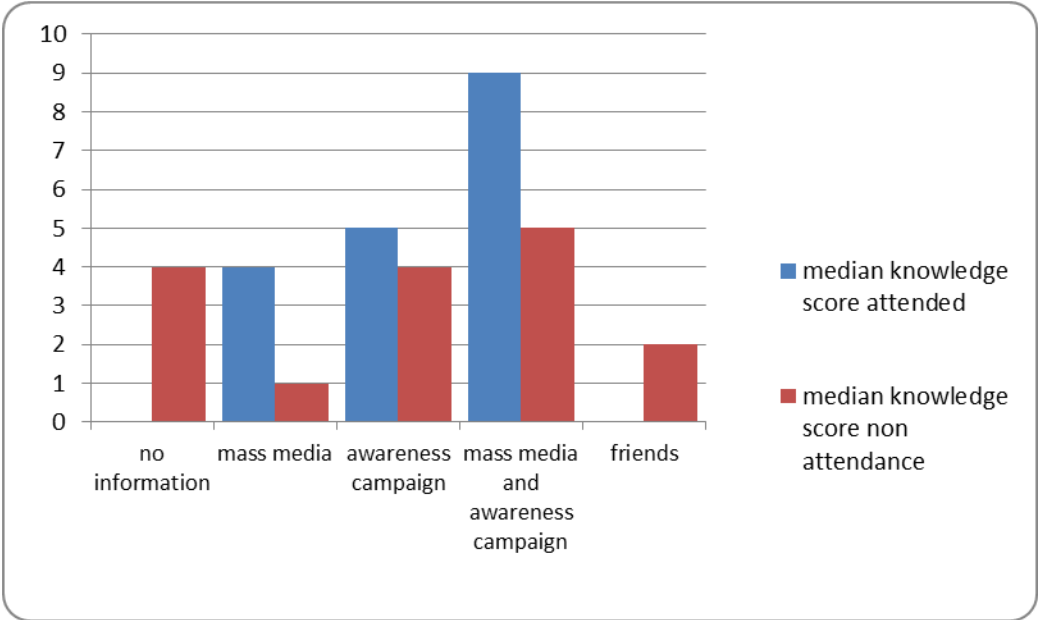


Figure 3.3.1: Median knowledge scores show respondents garner most information from a combination of the mass media and awareness campaign

**3.3.2. Other variables impacting knowledge**

Variables which may have influenced knowledge are outlined in tables 3.3.2 and 3.2.2a. Post EE there is a significant decrease in the number of respondents seeing saiga; this is likely to be due to a sampling effect, although saiga number have decreased so much that respondents may not be having the chance to see them as often. (Fig. 3.2.2, Kruskal-Wallis  $H(1) = 6.483$ ,  $N=258$ ,  $p < 0.05$ ).

Table 3.2.2 Baseline explanatory variables for knowledge.

KW=Kruskall-Wallis. MWU=Mann-Whitney U test \*\*\*=p<0.001 \*\*=p<.001 \*=p<0.05 (\*)=p<0.1

Variable	N	Test statistic	df	Direction of effect	P value
Village	258	MWU 540.000	xx	Villagers in Azhybai have most knowledge	.000***
Gender	133	KW 5.527	1	Men are more likely than women to have more knowledge	.019*
Age	133	MWU 540.000	xx	People under 21 have highest knowledge	.037*
Saiga exposure	133	KW 20.810	9	More exposure = more knowledge	.014*
Attitudes	116	KW 8.248	2	Favourable attitudes = more knowledge	.016*

Table 3.2.2a: Post campaign explanatory variables for knowledge

KW=Kruskall-Wallis. MWU=Mann-Whitney U test \*\*\*=p<0.001 \*\*=p<.001 \*=p<0.05 \*=p<0.1(\*)

Variable	N	Test statistic	Direction of effect	df	P value
Residency	124	KW 36.8	Those resident in village between 16-30 years have highest knowledge	6	.000***
Village	124	KW 95.0	Residents in Karaoba have least and Azhybai have most knowledge	2	.000***
Status	123	KW 7.4	Retired people have the most knowledge and unemployed people the least	3	.060 (*)

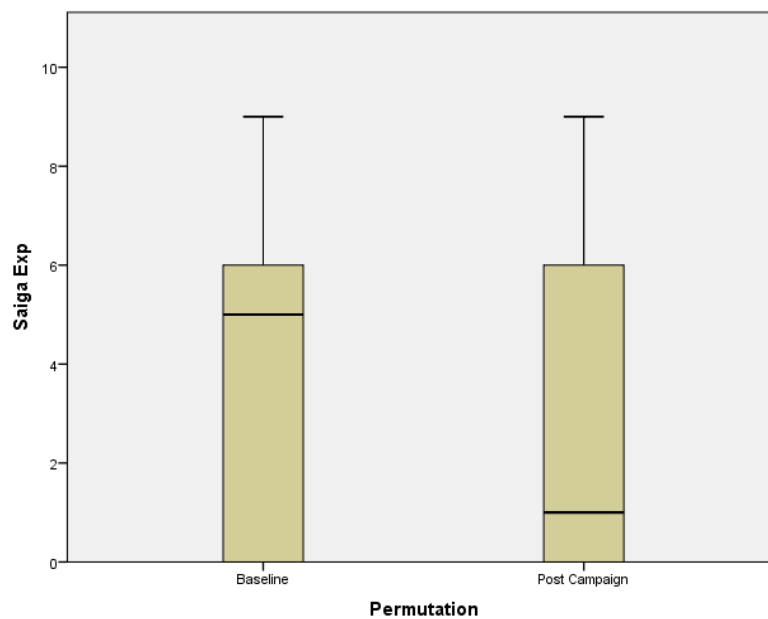


Figure 3.2.2. Incidences of people seeing saiga are significantly lower in the post campaign sample with a baseline median of 5 and a post campaign median score of 1.

### 3.4. Experience of the campaign

Participants who attended the awareness event (Mdn=10.5) rather than getting information from other sources (Mdn=0) were significantly more likely to have a more positive experience of the campaign overall (Mann-Whitney U= 540.000, N=71  $p < 0.05$   $r = 0.627$ ).

In order to further explore participants' experience of the campaign i.e. whether they found it informative and engaging, and to gauge their perception of its value, respondents were asked questions such as: *Did the campaign meet its aims of raising awareness of saiga related issues in an informative and engaging way?* A relatively low 37% of respondents (n=42) thought that the campaign met these aims.

The qualitative data gave rich information about people's feelings towards the campaign and their perception of the support available to them for saiga conservation. For example, some participants stated that it had *'Changed people's minds in a good way'* and *'Helped people respond positively to saiga and want to help them'*. One participant discussed their feelings that the plight of the saiga was low profile in Kazakhstan and the role of the awareness campaign in drawing attention to this had been positive, indicating the campaign had met its aims: *'The awareness campaign helped us understand that the loss of saiga is our primary wildlife problem; many of us have always lived here but never heard about saiga, now everyone is talking about them all the time.'*

Responses suggested more support from local government regarding saiga conservation is needed, as highlighted by one respondent *'We need more support from local government'*. Responses also point to the fact that the local community were receptive to the campaign and would be receptive to receiving more information, *'Local people still don't understand the importance of this problem.'* However, these responses also acknowledged that there was still a lot of work to be done and hinted at holes in the campaign.

When asked if there was anything that they particularly liked/disliked about the campaign, there were no negative answers, with respondents stating that Saiga Day was *'A fun event'* the entire campaign was *'Very well organised'* and *'Very informative'*.

93% (n=45) of respondents thought the campaign was a good way to teach people about conservatio. *'All the elements of the campaign worked well together. The saiga's situation would be so much worse if nothing had been done at all.'* *'We were told really well about the*

*issues so that now we can help fight the poachers'*. Several respondents thought it successful as it *'Teaches children from an early age to respect and preserve nature and wildlife'*. Some respondents rated their experience of the campaign positively because they appreciated the fact that events were free and in their own village.

### **3.4.1 Perceived importance of information**

48% of interviewees responded to the question *'Was the information given to you important?'* Of these, 93% replied affirmatively; highlighting the fact that the presence of people from outside their villages gave the information instant importance. It may be a point of interest for the running of future campaigns that some people felt having the campaign run by *'outsiders'* gave it more gravitas, especially as *'No one has ever come to us before and we didn't know about the problems saiga face, our children have never seen saiga and now they understand their importance.'*

Respondents acknowledged the importance of education to overcome the problem of poaching; *'Some local people know who the poachers are and this information is important to help us to save the saiga.'* One respondent emphasised the importance of the situation by stating, *'Soon the saiga will disappear totally and it will be just like the mammoth'*.

### **3.5. Attitudes towards saiga conservation**

Pre-campaign there was a significant negative correlation between attitudes and knowledge, (the higher the knowledge the less favourable the attitude), with a spearman's coefficient of ( $r = -.267$   $N = 116$   $p < 0.01$ ,  $p = 0.004$ ). Post campaign this correlation became non-significant ( $r = -.157$   $N = 108$   $p < 0.01$ ,  $p = 0.106$ ).

Post EE there is a significant increase in positive attitudes. (Fig. 3.5. Mann-Whitney  $U = 10,352$ ,  $N = 222$   $p < 0.05$   $r = 1350.25$ ). Looking at the correlation between attitudes and behavioural intent there is a positive but not significant relationship, indicating a trend, between those with more favourable attitudes having more positive behavioural intent. ( $r = .115$   $N = 222$   $p < 0.01$ ,  $p = 0.087$ ).

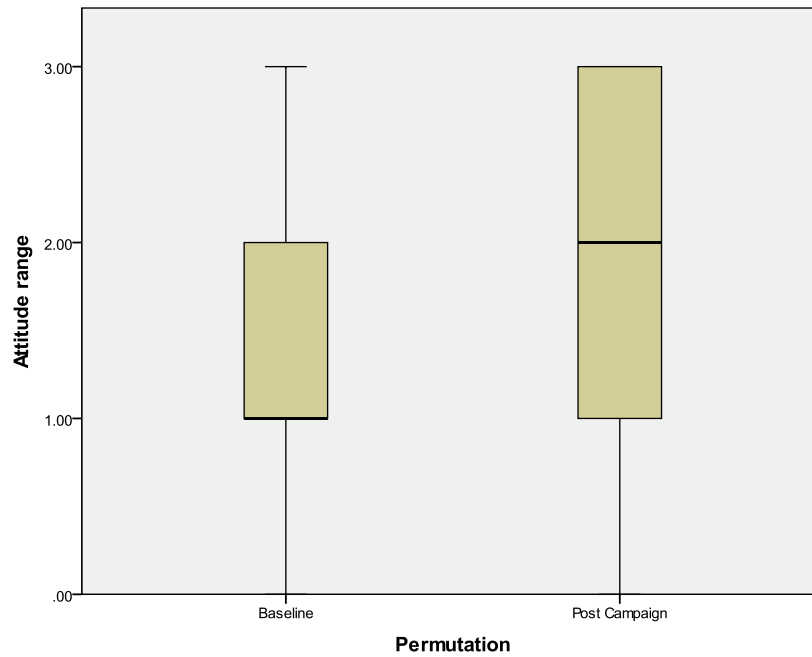


Figure 3.5. Attitudes towards saiga conservation were measured for baseline data (mdn=1) and post campaign (mdn=2) and found to have risen significantly post campaign with 95% confidence intervals.

Adults from Azhybai are more likely to have less saiga knowledge. Villagers here were not informed of the awareness event by the local government as planned. Additionally, the village is known by the ACBK to harbour more poachers and people sympathetic to them, than other villages.

Respondents were asked to give their level of agreement with a statement about the loss of saigas from Kazakhstan, (see fig. 3.5a). Pre-campaign most people (n=74) stated that they cared to a certain extent that saiga may disappear, while 10 stated that they did not care if saiga disappeared. This contrasts with post campaign responses where only 5 people would not care if saiga disappeared and 54 agreed with the statement “*I care very much that saiga may disappear*”. Attitudes had significantly improved since the inception of the campaign, (Mann-Whitney U= 8,923.000, N=250 p<0.05 r= 546.34).



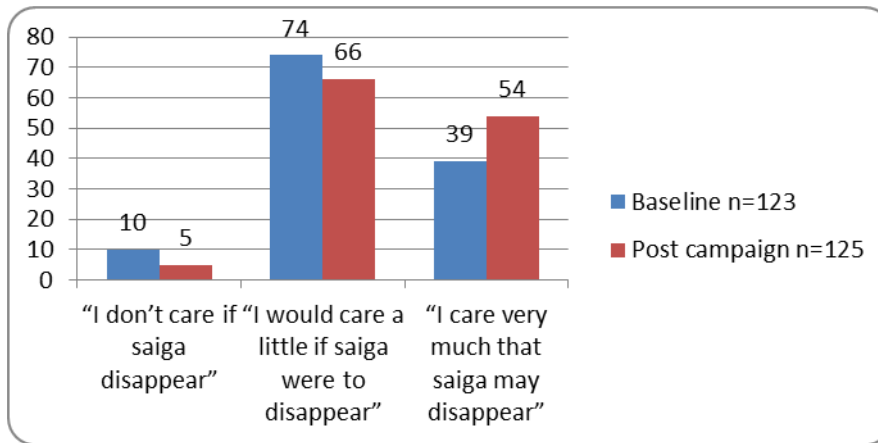


Figure 3.5a. Interviewees' responses to statements about the loss of saiga.

When asked why they felt that saiga were important, participants expressed pride in nature as well as recognising saiga's cultural significance; *'I am proud of my country and value its wildlife.'* *'Saiga are a holy animal.'* Participants also recognised saigas are important for the functioning of the steppe ecosystem; *'They have always been here and are an essential part of nature.'* *'They are important for the steppe wildlife and other animals like wolves depend on them, we must protect them.'*

### 3.6. Behavioural intent

Positive behavioural intent in towards saiga conservation rose significantly over the campaign. (Fig. 3.6 Kruskal-Wallis  $H(1) = 25,649$ ,  $N=258$   $p < 0.05$ ), with almost double the positive behavioural intent post campaign. Behavioural intent is also correlated with positive attitudes towards saigas.  $N=222$  ( $r=0.115$ ,  $p < 0.1$ ,  $p=0.087$ ). This supports Hypothesis 1.

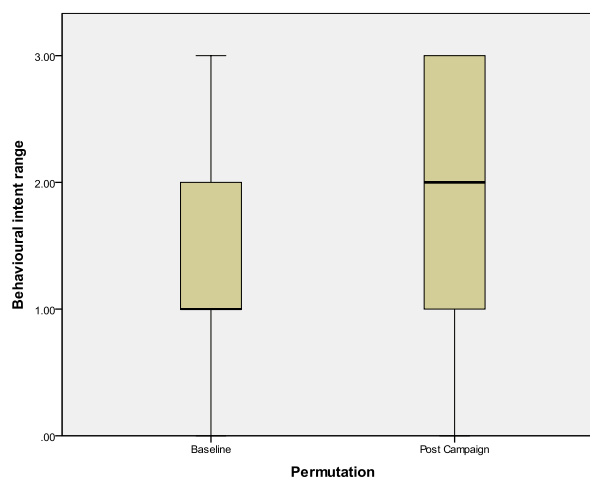


Figure 3.6: Overall positive behavioural intent increased significantly over the campaign. Baseline (mdn=1) and post campaign (mdn=2) with 95% confidence intervals.

The two measures of behavioural intent, WTP and WTH (Non-monetary assistance, such as campaigning, speaking with friends, monitoring and patrolling), both rose over the course of the campaign. See figures 3.6a and 3.6b respectively.

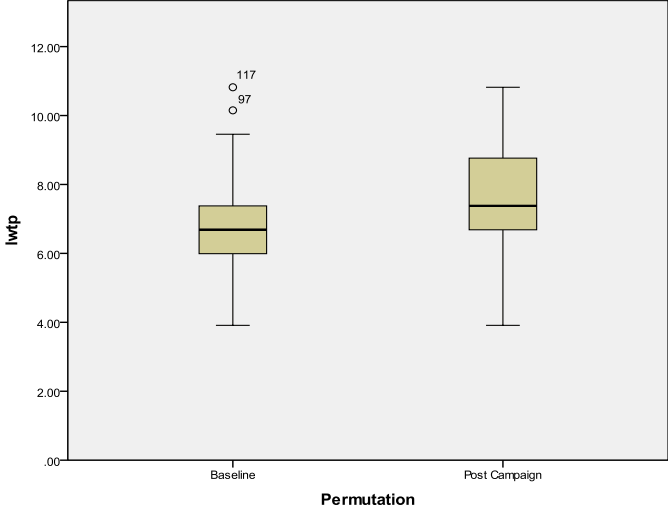


Figure 3.6a: Log WTP rose 19% over the duration of the campaign

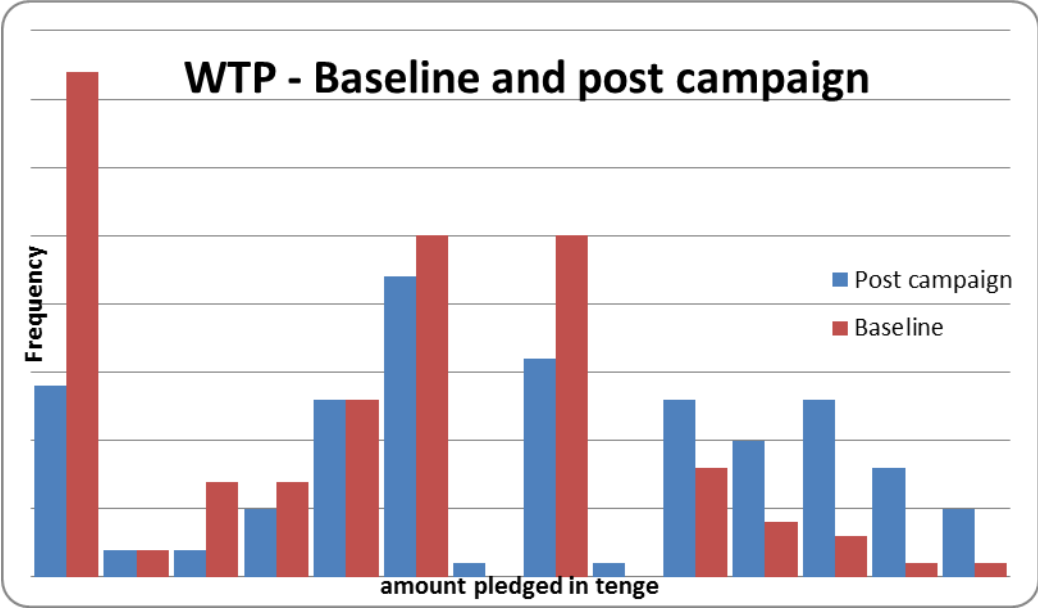


Figure 3.6b. WTP increased from baseline figures, shows less zero bids and more people willing to pay more.

There were several variables which showed significance when related to WTP, such as village of residence, age and attitudes. (see table 3).

Table 3.: variables which have a significant relationship with WTP.  
 MWU=Mann-Whitney U test \*\*\*=p<0.001 \*\*=p<.001 \*=p<0.05 \*=p<0.1(\*)

Variable	N	Test statistic	R value	P value
Villagers in Karaoba pay the most, Borsoy the least	96	MWU 5.000	127.62	.015*
Age 42-60 age groups are WTP less. Under 20 age group sig. more likely to be WTP more	96	MWU 540.000 MWU 1,428	127.62 145.77	.015* 0.02*
Attitudes, pre campaign people with less favourable attitudes were sig, less likely to be WTP	82	MWU 1144	144	.05*

Contrary to hypotheses 2 wealthier people showed no significant increase in being WTP more than poorer people (Kruskal-Wallis H (3), =3.228, N= 108 p<0.05, p=0.358).

### 3.6.1. WTP and zero bids

More people across all wealth categories were WTP more post campaign with fewer low/zero bids. When asked for reasons for their WTP 43% (See Table 3.6.1) of respondents stated *"I'm interested in saiga and their conservation is a priority"*.

Zero WTP bids were analysed (see table 3.6.1) and only three were found to be true protest bids. The reason for the majority of zero bids, was given as *"Our household cannot afford to pay"*.

Table 3.6.1 Respondents' reasons for bids. Respondents were able to choose multiple reasons for WTP.

Number of respondents	Number of zero bids	Statement	True protest bid
13	9	<i>Our household cannot afford to pay</i>	x
2	1	<i>I'm not interested in saiga and their conservation is not a priority</i>	x
4	2	<i>I don't believe a contribution scheme is workable</i>	✓
1	1	<i>The government / international community should pay for this</i>	✓
0	0	<i>I need more information / time to give an answer</i>	x
64	0	<i>I'm interested in saiga and their conservation is a priority</i>	x
14	0	<i>I get satisfaction from giving to a good cause</i>	x
31	0	<i>We should protect saiga for future generations</i>	x
19	0	<i>We should protect our wildlife and environment in general</i>	x

### 3.6.2 Willingness to help

There was a significant increase in WTH post campaign, (Kruskal-Wallis H (1) =34.444, N=258 p<0.05), with the pre campaign WTH at 59% and post at 91%.

It is not possible to tease apart the data to explore whether those people who attended the awareness event did so as they were already predisposed to be WTH, or whether due to attending the event they became WTH. However, a test determined that those who attended the event were significantly more likely to be WTH than those who do not (n=61). (Kruskal-Wallis H (1) = 0.24, N= 124 p<0.05).

Post campaign forms of behavioural intent such as campaigning and speaking to friends had rose 37%, although the intent to monitor decreased by 36%. This indicates that respondents

were generally more WTH with saiga conservation post campaign, supporting hypotheses 1. See Figure 3.6.2.

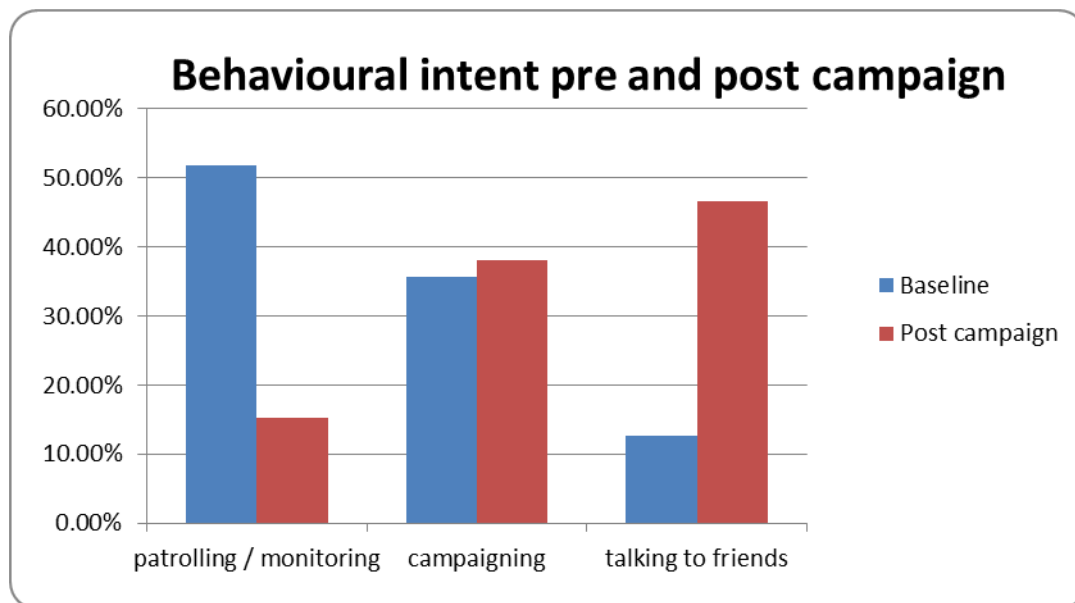


Figure 3.6.2 Respondents were WTH in different ways post campaign, more people are now willing to spread the word and campaign, whilst fewer people are keen to monitor.

### 3.6.3. WTH pledges and zero WTP bids

Deleting protest bids and cross referencing them with WTH, shows that 10 of the 11 respondents were willing to help saiga conservation in some alternate way, primarily talking to friends and campaigning. Only one respondent with a zero bid also refused to be WTH. This respondent was found to have lower than average scores in behavioural intent, knowledge, attitudes, and no exposure to the campaign.

### 3.6.4. Relationship between WTH and WTP

If respondents are WTP (regardless of the amount) it is more likely they are WTH (Pearsons Chi-square  $\chi^2=13.32$ ,  $p=0.00$ ,  $df=1$ ); 79.5% of respondents are WTP, while 86.5% are WTH. ( $n=258$ ). See table 3.6.4 for a list of variables impacting WTH/WTH.

Baseline figures show that as WHP increases there is a significant rise in WTH, with a correlation coefficient of ( $r= 0.208$   $N= 133$   $p<0.05$ ,  $p= 0.042$ ). Post campaign as WTH increases WTP significantly decreases, with a correlation coefficient of ( $r= -.203$   $N=110$

p<0.05, p= 0.033). This may be due to participants gaining an insight and increased confidence into how they can become actively engaged in saiga conservation

Table 3.6.4 Significance of explanatory variables on WTP and WTH baseline / post campaign.

All data were investigated using Kruskal-Wallis tests. \*\*\*=p<0.001 \*\*=p<.001 \*=p<0.05  
\*=p<0.1(\*)

Explanatory variable	WTP baseline	Direction of effect	WTP post campaign	Direction of effect	WTH baseline	Direction of effect	WTH post campaign	Direction of effect
Age	.043**	Those under 21 were more WTP	NS	--	.087(*)	Those under 21 were more WTH	NS	--
Gender	NS	--	NS	--	NS	--	NS	--
Village	.006**	Those in Karaoba were WTP more	NS	--	.072(*)	Those from Borsoy are less likely to be WTH	NS	--
Education	NS	--	NS	--	NS	--	NS	--
Residency	NS	--	NS	--	NS	--	NS	--
Exposure to saiga	NS	--	NS	--	NS	--	NS	--
Attitude	.022**	Those with less favourable attitudes are WTP more	.029**	Those with less favourable attitudes are WTP more	NS	--	NS	--
Behavioural intent	NS	--	NS	--	.043**	People with higher behavioural intent are more likely to be WTH	0.043**	People with higher behavioural intent are more likely to be WTH
Knowledge score	NS	--	NS	--	NS	--	NS	--
Wealth	NS	--	NS	--	NS	--	NS	--
Exposure to campaign	N/A	--	NS	--	N/A	--	NS	--
Experience of campaign	N/A	--	0.082(*)	Those with more positive experience of the campaign are WTP more	N/A	--	NS	--
Attendance at awareness event	N/A	--	.08(*)	People who attended the event are more likely to be WTP	N/A	--	.024*	People who attended the event are more likely to be WTH
WTP	--	--	--	--	.043**	People are more WTH if they are WHP	.034*	People are more WTH if they are

								WHP
WTH	.043**	People are more likely to be WTH if they are WTP	.034*	People are more likely to be WTH if they are WTP	*	--	--	--

### 3.7. The future

Participants were asked what they thought could be done better in the future; responses ranged from those specific to the events, such as publicising them better (it was discovered that the local council in each village had been responsible for publicising the awareness events, and had only done so in two villages, and only through word of mouth to council workers). The respondents also suggested showing more documentaries and making the event more locally relevant, by outlining what they can do to help and what is being done by conservation organisations locally/internationally.

Diverse answers regards population numbers, ecology and migration as well as cause of the saiga deaths such as toxic fog, nuclear testing, deliberate poisoning of water and plants, to disease in addition to ‘conspiracy’ theories with villagers stating that *‘The government is being paid by poachers to manipulate the results of the tests into their deaths’*, that government officials are *‘turning a blind eye to the poaching and are being paid by the poachers’*, show a need for clear answers to be given to local communities.

Respondents suggested that local people need to be involved at a community level regards discussions about saiga conservation and action plans, highlighting the need to get the entire community – especially the teenagers - involved.

Many respondents called for more awareness and Saiga Day events, in which they could take an active role. They supported the appointment of local leaders who would act as liaison and coordinator for local meeting, presentations and events.

## 4. Results – Children

Of the 992 children in the villages surveyed, 465 attended the awareness day while 318 attended Saiga Day. 89 of the children who attended both events were interviewed.

#### 4.1. Children's estimated baseline and post campaign knowledge

As no baseline data exists for children, respondents were asked for their perceptions about how much knowledge they held about saiga. There has been a significant rise in knowledge from baseline ( $Mdn=0$ ) to post campaign ( $Mdn=2$ ), (Mann-Whitney  $U= 5,723.000$ ,  $N= p < 0.05$   $r= 430.88$ ). Most children ( $n=52$ ) indicating that they have 'High' knowledge and only 2 indicating that they have no knowledge. See figure 4.1.

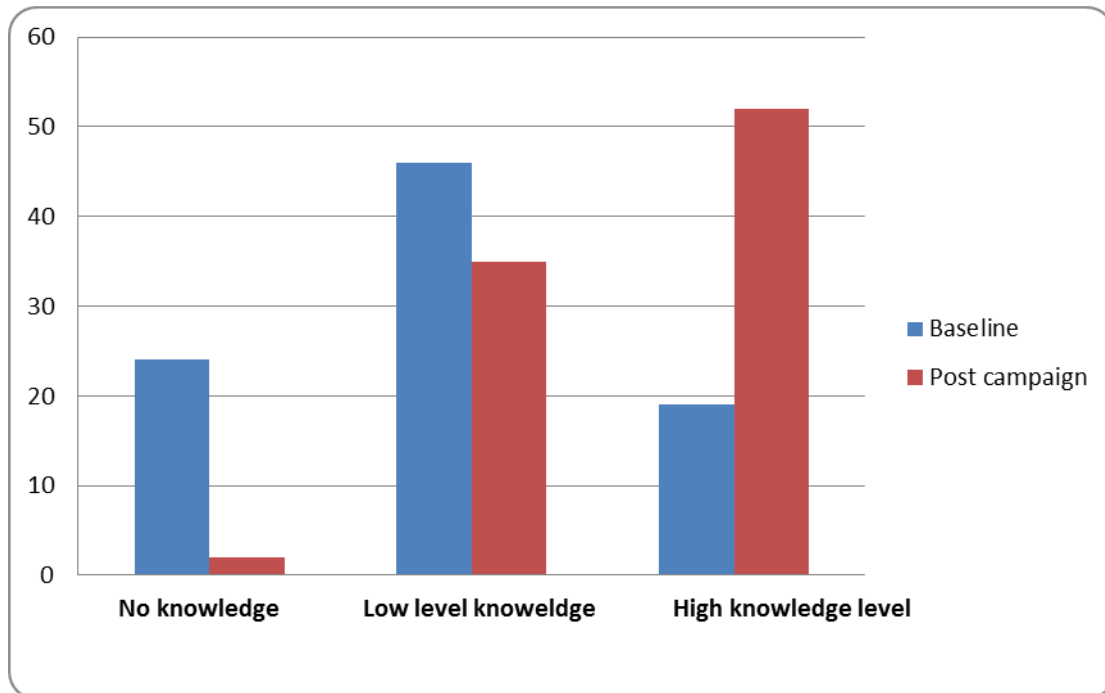


Figure 4.1. Perceived levels of knowledge have increased since inception of the campaign

#### 4.1.2. Post campaign knowledge

In general, answers to knowledge questions show children understood the key messages of the campaign.

To assess actual levels of knowledge children were asked a series of questions which pertained to key saiga conservation issues. One point per correct answer was awarded, with a maximum score of six. 39/89 scored full marks, followed by 38 children who scored five correct answers each. 100% of the children scored 50% or over in these questions indicating a high level of knowledge. Key questions and responses to each are set out below.



#### **4.1.3. Main threats to saiga**

Children seemed to have understood the key threats to saiga. 66/89 responded correctly that the main threat is poaching, the next most popular answer was climate (21/89) but only 10/89 responded that disease was a problem, despite the mass die-offs having been outlined as a threat.

#### **4.1.4. How to combat saigas' challenges**

When asked how to combat the saigas' problems only 5/89 did not have an answer whereas others answered that we must '*Protect and look after them*' (50/89) and '*Stop poaching*' (23/89). Several children replied that "*When I grow up I will protect them*" or showing awareness and empathy with the saigas' situation.

#### **4.1.5. Saiga facts**

The majority of children (n=87) knew what saiga eat and that they lived in Kazakhstan, if not recognising they live in other countries too. When asked to report something that they had learnt about saiga during the campaign there were varied answers, ranging from facts such as "*They change colour to white in the winter*", "*Their horns are used in Chinese medicine*" "*The young are called kuralai*" "*They are an important part of the steppe ecosystem*", to "*A way to stop the deaths of saiga is to stop fires in forests*" (this may be due to recollection of a short scene including fire, in a saiga cartoon the children were shown). One child responded that "*They migrate a really long way, to America*". However, this child was emphasising the fact that they migrate large distances.

#### **4.1.6. Variables impacting knowledge**

Children from Borsoy and Nursai were more likely to have significantly higher knowledge than those from other villages (Mann-Whitney U= 1,675.000, N= 89, p<0.05). Children's' experiences of the campaign had a significant impact on their knowledge. Children who enjoyed the campaign were more likely to have significantly greater knowledge scores than others (Kruskal-Wallis H (2) = 12.624, N=89 p<0.05). Knowledge was positively related to

experiences of the campaign (Spearman’s coefficient  $r=.208$ ,  $p<0.05$ ). Children with the least positive experiences of the campaign also were resident in Azhybai, one of the villages where there was found to be the lower levels of knowledge.

**4.1.7. Attitudes towards saiga conservation**

To explore children’s attitudes to saiga conservation a series of questions were asked and each child was placed on a scale of negative to favourable attitudes relative to the likert scale.

In general children held positive attitudes. (See figure 4.1.7.). Only one child reported an ambivalent attitude to saiga.

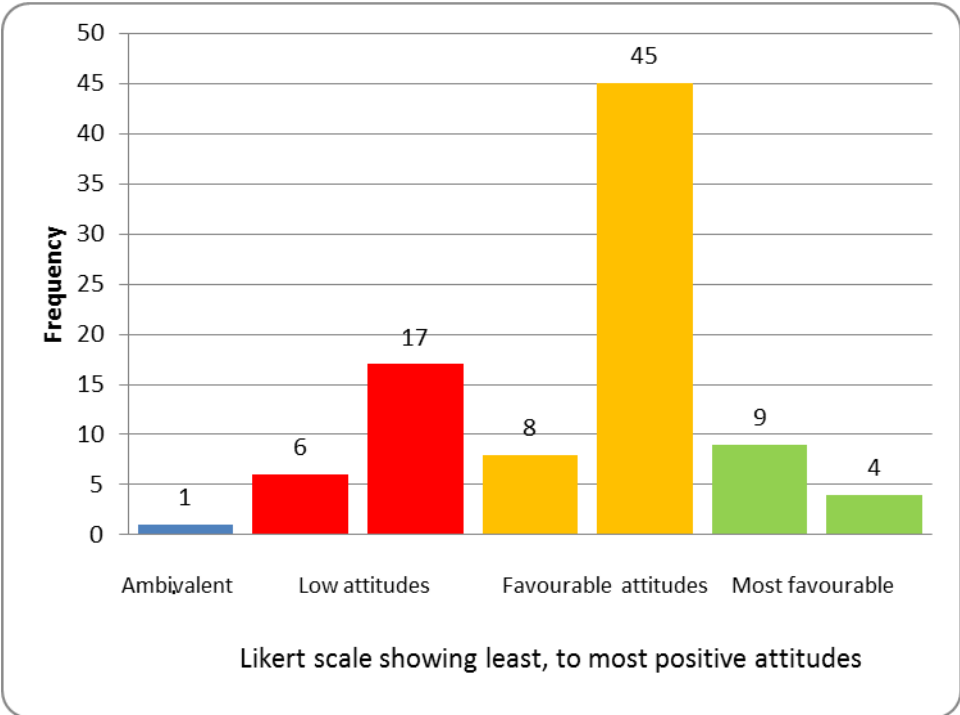


Figure 4.1.7. Children hold favourable attitudes towards saiga conservation with only one being ambivalent and none holding negative attitudes.

One question to illustrate attitudes towards the extinction of saiga was asked; “How would you feel if there were no saiga in the world?” The majority of children, (83/89) would feel sad if saiga were extinct.

#### 4.1.8. Variables impacting attitudes

Village of residency was found to have a significant impact not only on the knowledge gained but also on the attitudes. Children from Azhybai are significantly more likely to have less favourable attitudes, while those from Akoba have the most positive attitudes. (Kruskal-Wallis H (4) = 34,404, N=89 p<0.05). See figure 4.1.8. Spearman's correlation coefficient found no significant correlations between knowledge and attitudes scores with villages; (r= - 225, N=17 p< 358) this may be due to the low sample size and would be worth further investigation.

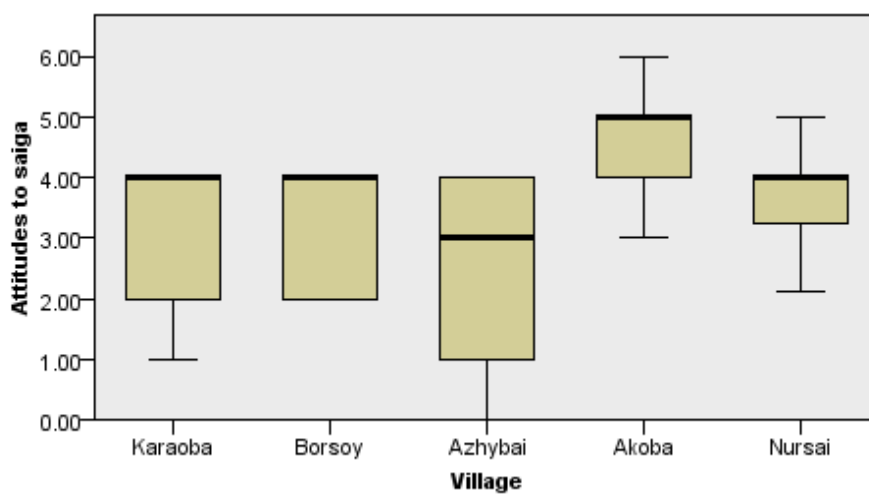


Figure 4.1.8. : Boxplot showing the differences in children's attitudes according to village residence. Darker lines indicate medians, Azhybai is the village with lowest attitude scores and Akoba has the highest.

Exposure to saiga was a significant variable impacting attitudes; children with less exposure to saiga were significantly more likely to express less positive attitudes (Kruskal-Wallis H (8) = 19.242, N=89, P<0.05).

#### 4.1.9. Experience of the campaign

None of the respondents described a negative experience of the campaign, although three has a less positive experience relative to the group, e.g. "I didn't enjoy saiga day as I drew a bad picture", while the majority of children (n=67) had had a very positive experience of the campaign.

Children from Azhybai ( $Mdn=6$ ) were significantly more likely to have had a less positive experience of the campaign as opposed to the other villages ( $Mdn=7$ ). (Mann-Whitney  $U=581.000$ ,  $N=89$   $p < 0.05$   $r = 40.38$ ). In these cases it seems that the negative response was due to experience on the day; *'I painted a bad picture'*, *'I wanted to play more games'* or *'I didn't like dancing'*. This coincides with the same village having least positive attitudes towards saiga and one of the lowest knowledge scores.

#### **4.1.10. Taking part in saiga day**

Only four respondents disliked parts of Saiga Day, three of whom were from Azhybai. Some were so motivated by the experience they wanted to know what they could do to help the saiga; one even saying *"When I grow up I want to work for the ACBK and save the saiga too"*.

Results highlighted children's favourite parts of the day to be playing games ( $n=38$ ) especially *'Poachers and Saiga'* or *'Migration'*, writing letters to overseas friends ( $n=13$ ) and drawing and painting ( $n=12$ ).

#### **4.1.11. Desire to participate in future saiga days**

All the children ( $n=89$ ) wished to take part in another saiga day. As they wanted to learn more about how to save saiga, to play and that it had been a fun and interesting day that they wanted to repeat.

Many enjoyed the learning experience, wanting to receive more books so as to understand how to protect saiga; *"I want to know more about saiga, please bring us new and interesting information"*. Some noted that they would like to hear from overseas pen-pals who they had written to on saiga day and were interested to *"..hear about the animals they have and what they think about our saiga"*.

Others focused more on fun element; wanting to watch more cartoons or to play more games ( $n=26$ ), or to do more painting ( $n=22$ ). One child asked to *"Draw a huge picture of all the things that we have learnt about saiga"*. This could suggest they felt that they had gained a lot of new information and denotes a sense of social responsibility by wanting to raise

## **5. Discussion**

This chapter examines the findings of this study in relation to its hypotheses and aims considering them in the context of existing research literature. The implications of the findings for the EE campaign and recommendations will also be discussed. Finally, the limitations of the study are examined and recommendations made for future research.

### **5.1. Exploring the adult data**

#### **5.1.1. Knowledge and attitudes**

Higher knowledge, attitude scores and positive behavioural intent can be seen for people who were exposed to the campaign. These findings are in-line with those from authors suggesting that EE leads to increased knowledge of facts surrounding conservation issues, highlighting the contribution of the present study to the literature in this area (Infield 1988; Damerell, 2009; Howe, 2009). The findings are consistent with Ajzen's (1991) TPB where knowledge leads to changes in attitude. Interestingly, pre campaign knowledge correlated with less favourable attitudes, this may be as knowledge villagers held pertained to the die-offs, leading them to worry about the safety of their own cattle, causing negative attitudes. It is possible respondents are hunters/sympathetic to hunters; with knowledge but no emotional attachment to saiga, seeing them as a source of income. The non-significance of this score post campaign, combined with a general trend in increased attitudes and behavioural intent, may indicate that the campaign has had success in increasing knowledge, clarifying points of concern and increasing positive attitudes and behavioural intent.

The majority of children indicated poachers are the main threat to saiga while adults stated disease; few adults rated poaching as a major problem. This has implications for future interventions which may benefit from considering the mistrust that adults have for the government, many people, even those who attended the awareness event, stated the government was untrustworthy as it was colluding with poachers. By stating disease as a major problem adults may be minimising and shifting their responsibility and potential to help with saiga conservation, viewing disease as a problem for the authorities to solve. This reflects the external locus of control (Hines *et al.* 1986/7) whereby participants perceive

factors outside their control impacting on their ability to influence saiga conservation. The TPB notes that it is important to empower people to promote environmental change, however, the study noted people are unaware of how to help. Uzzell and Rutland (1993) emphasise the importance of challenging peoples' beliefs about their ability to make a change by providing positive experiences to overcome 'action paralysis', this is essential for future intervention success.

Attitudes to saiga conservation were more positive post campaign, with people indicating an emotional attachment with them, stating; '*I am proud of them, they are part of the beauty of the steppe*'. Ham and Krumpe (1996) suggest that EE incorporating beliefs prominent to the target audience are more useful than those that do not. This has implications for future campaigns as authors such as Pujadas and Castillo (2007) and Waylen *et al.*, (2010) note that inadequate considerations of the values and culture of local people can produce ineffective interventions. Fernandes (2006) found that changing social norms in a culturally sensitive way and applying informal social pressures made it unacceptable to overfish the Arapaima gigas fish in Guyana; strengthening social pressure against poaching would help saiga conservation. Children's data suggests they may apply social pressure if given the tools to enable them to do so. Hence, future work should take the role children into consideration (Ballantyne *et al.*, 2001). However, as Waylen *et al.*, (2009) found, successful campaigns many change attitudes, but they must be part of a wider campaign to address the drivers of the damaging behaviours.

### **5.1.2. Variables impacting knowledge and attitudes**

#### **5.1.3. Village**

Adults in Karaoba are likely to have less saiga knowledge than others. It is difficult to tease apart knowledge and attitudes developed due to the campaign and those formed prior. Raising questions such as, is low knowledge a result of not being informed of the event, which leads to low attendance and less opportunity to learn about saiga? Or, because existing low attitudes predispose people to be less likely to be interested in learning about saiga? Research suggests substantial gender differences in beliefs about nature. Kellert (1996) noted men exhibit more support than women for the exploitation and control of the

natural world, i.e. hunting/poaching. With far fewer women attending the EE event than men results may be skewed for this reason. Hence, it is important to understand the drivers of attitudes and knowledge before a campaign begins; not only to address these issues within the context of the campaign, but in order to create an environment which attracts people with conflicting opinions to attend.

#### **5.1.4. Attendance**

Knowledge scores were not significantly higher for adults who attended the awareness event. This may be due to the fact that some people who did not attend the event managed to gather information from material, such as brochures, left by the ACBK. This mirrors findings by Cates (1990), who found that when patients were given hand-outs, as opposed to direct instruction about immunisations, a threefold increase in vaccination rates ensued. Although Cates' study is from the field of health promotion, it highlights how knowledge can be increased and behaviour changed outside direct contact and is pertinent to successful communications with the general public, hence it is worth considering implementing such measures in future campaigns.

Some adults may have acquired information from their children who took part in the campaign, from speaking to friends and colleagues who attended the event, or from the mass media. This may illuminate the findings of Vaughn *et al.*, (2003) and Damerell (2009) who noted a significant transfer of knowledge from children who had taken part in EE programmes, to their parents; the former also found evidence of intercommunity transfer of knowledge. With regard to the present study this may account for the high knowledge scores of people who did not attend the awareness event. However, without data regarding family composition and attendance at the campaign this may be a tentative conclusion.

#### **5.1.5. Age and residency**

Baseline data suggests respondent age had a significant relationship with knowledge; with those aged 41-60 significantly more likely to have more knowledge, yet this was not found in post campaign data. This conflicts with Kruse (1999) and Van Liere and Dunlap's (1980) 'Age hypothesis' who state that younger generations have more knowledge and environmental

concern while old age correlates with negative knowledge and environmental concern. This stresses the importance of considering local factors; perhaps younger people in their studies had access to 'new media' and world-wide reports on environmental issues, whereas in the present study young people have limited access to reports other than those on TV, radio or newspapers, and may warrant future research.

Post campaign, residency replaces age as a significant variable, with those resident in villages between 16-30 years displaying most knowledge. Notably, people who had been resident in villages under the Soviet regime are more likely to have had first-hand experience of saiga. As one participants' comment highlighted, they recalled times when saiga came into the villages '*In their hundreds to drink from troughs in the street*'. Older participants may have developed knowledge through information provided by the Soviet regime. E.g. older respondents recalled the Soviet regime disseminating information that saiga were a pest to crops, and were given petrol money to move herds away. The present study, like others, notably Howe (2009), found exposure to saiga was to have a significant relationship with knowledge. However, this was only found in the pre-campaign data, possibly as respondents had less exposure to saiga due to the fact that there has been a dramatic decline in numbers in the past year, or sample through bias. Linnell *et al.*, (1995) found that people often enjoy knowing wild animals belong to stable populations, even if they don't interact with them. Perhaps gaining knowledge of saiga and seeing images of them through the campaign replaced this need for direct contact, this could be useful to note for future campaigns if people have increasingly less contact with saiga, as populations take time to recover.

#### **5.1.6. Gender**

Baseline data suggested that knowledge was significantly related to gender, with men significantly more likely to display more knowledge than women. Although empirical evidence is inconclusive, authors such as Steger and Witt (1989) and Vaske and Donnelly (2001) in their study of forest management, found that women are more likely than men to hold pro-environmental attitudes. Mohai (1992) suggests that women are more concerned with local environmental issues than men, and are less likely to join environmental organizations. In contrast, the present study's qualitative data found that it was women who suggested establishing pro-saiga groups. Ozanne *et al.*, (1999) found women are less likely



to attend meetings of environmental organizations, again, this was not the case in the present study as a larger percentage of those interviewed who attended the awareness event were women. Silova and Magno ( 2004) note that gender equality under the Soviet regime was a 'myth', with women less educated than men, this may have a cultural legacy, manifesting in women being less willing to display knowledge. With this in mind it could be worthy of investigation to ascertain if there is a gender difference in knowledge and behavioural intent, with a larger sample size, paired data or ensuring anonymity through postal questionnaires.

In contrast to children's data 'Experience of the campaign' had no significant effect on adult data. This may be due to questions in the present study unable to elucidate this information. Many of these questions were left blank, negating statistical analysis. This not flagged by the pilot study, but as these questions were multiple choice some respondents may have chosen just to answer the 'easier' ones or misunderstood that they had multiple questions and answers. Interviewer influence may also have been a factor (Bernard, 2002), as adults were aware the interviewers were the organisers of the EE event, socially desirable responding must be considered as participants may have wished not to cause offence by offering negative responses regarding the running and experience of the event.

There is evidence to suggest adults may not have been as engaged as children, with only 37% thinking the campaign met its aims of educating in an interesting, relevant way. Many adults responded that they were unsatisfied with the information, wanting more region specific and age relevant information like documentaries. Subsequently, it would be beneficial to provide more targeted, relevant materials in future campaigns.

However, adults appreciated the campaign saying it raised awareness in a positive way, many stating they had not realized the extent of the saigas' plight. It is interesting to recognize that the delivery of the campaign by 'strangers' lent it gravitas, with many villagers commenting that the presence of outsiders inspired hope that now something was going to be done.

### 5.1.7. Behavioural intent

Waylen *et al.*, (2009) and Holmes (2003), noted that attitudes may not always correspond with behaviour. However, the study found a strong correlation between positive attitudes and proxy measures of behaviour such as peoples' WTH/WTP. Paradiso and Trisorio (2001) showed that increased knowledge of a good reduces the discrepancy between pledged and real WTP; although the data did not show any significant relation between WTP and knowledge, both have increased and further research here is needed. However, it may indicate that with increased knowledge people are better able to make informed choices about their behaviour.

WTP and WTH both rose significantly post campaign. Unexpectedly, there was no relationship between wealth and WTP with poorer participants as likely as wealthier ones WTP the same amount. However, as there are high levels of unemployment in the villages the level of WTP was low, averaging 800 tenge.

With only one respondent not WTH or WTP, it indicated a high level of success in this area of the campaign. Additionally, when zero WTP bids were explored these people are still WTH, stating that they cannot afford to pay but care about saiga and the environment, want to preserve nature for future generations and are WTH. Additionally, more people were WTH than were WTP. Post campaign data indicated that as people's attitudes become more positive and they become emotionally attached to saiga they are more WTH. This has implications for future evaluations; in regions where there is low income it may be prudent to assess people's WTH not WTP, or to obtain reasons for zero/low WTP bids.

Post campaign WTH rose and WTP decreased, this may show that as people gain an understanding of how they can help they prefer to become actively engaged. WTH is more empowering than WTP, reflecting part of the TPB where people feel able to make an impact; this supports Kals *et al's.*, (1999) study into reduced energy consumption which noted that rational decision making alone does not explain behaviour and evaluations must take into account the power of emotions such as feelings of guilt or emotional affinity towards nature. The WTH results, combined with people's reasons to help; *'I'm interested in saiga and feel that their conservation is a priority'* or *'We should protect saiga for future generations'*, indicates extensive goodwill towards saiga conservation which should be acted upon.

The TPB highlights 'actual behavioural control', to this end future interventions should note that audiences should be left with strategies for how they can become engaged. Adults asked how they could get involved; if there were groups they could join to patrol, numbers they could call to alert police to poachers, or clubs that meet to discuss issues. None of which currently exist, and could be a potential next step for saiga conservation in the area. However, this would need to be implemented as soon as possible as commentators such as Adelman *et al.* (2000) found that changes in conservation behaviour after visiting an aquarium were short-lived due to the lack of re-enforcing experiences.

## **5.2. Exploring the child data**

### **5.2.1. Acquisition of knowledge and attitudes**

Children perceived their knowledge levels to have increased significantly post campaign. They were able to report key facts which they had learnt, with most children demonstrating a high level of knowledge. These findings are supported by those of Kusmawan *et al.*, (1981) who state that activities outside the classroom (like the saiga campaign) are effective at enhancing learning. Several children asked that on future Saiga Days they are taken to the steppe and have the chance to see a saiga first-hand, which many of them had never experienced. These requests are interesting in that they reflect the findings of authors such as Vaughn *et al.*, (2003) and Van der Born *et al.*, (2000) who note that extra-curricular activities are better at instilling pro-environmental attitudes and that direct and intense experience of the environment is a successful method for instilling favourable behaviour. Ballantyne and Packer (2001) note that this enables children to act as catalysts for change in their homes and communities. To this end it may be desirable to take children and young adults to the steppe, engage them with local wildlife following-up with other events which promote environmental behaviour, e.g. Howard (1997) found that the majority of visitors to a turtle rookery were more knowledgeable and reported pro-environmental behaviour, such as litter picking on beaches, up to six months after the experience.

The majority of children reported very positive attitudes towards saiga, emphasising an emotional connection to saiga, with many stating the desire to protect them. Almost all the children replied that they would be saddened if saiga were extinct. Children's statements

that saiga were 'cool' 'beautiful' and 'kind' may also show an emotional engagement with saiga conservation bought about through the campaign. Their interactions and engagement with the campaign leading to positive attitudes towards saiga conservation and a desire to learn more could also be seen, with all children conveying a wish to take part in another Saiga Day and to learn more about saiga. This shows a desire to continue to learn and build upon knowledge already received. Children could also be taught about wider conservation/steppe conservation issues to strengthen their knowledge base.

### **5.2.3. Behavioural intent**

Although this was not initially a variable that the study set out to measure it was clear that children also demonstrate behavioural intent which should be overtly measured in future campaigns. Children demonstrated social environmental responsibility and a proactive desire to share their new knowledge through comments such as '*I want to paint a really big picture about all the things we have learnt about saiga*'. '*I have told my mum about what I learnt about how to save saiga*', several children noted that they wanted to '*help protect saiga now*' or '*Save saiga when I grow up*'. Children demonstrated a desire to share their conservation stories with those of children in other countries, indicating that they were looking forward to hearing back from the pen-pals they had written to with news about saiga during on Saiga Day. This will serve to have a wider impact on conservation by strengthening attitudes in their own as well as in overseas communities.

### **5.2.4. Experience of the campaign**

Children's experience of the campaign (satisfaction with the campaign, level of enjoyment of Saiga Day, perception of value of the information etc.) was found to be the most significant variable influencing their acquisition of knowledge. Children who enjoyed the campaign and the learning experience showed higher knowledge scores than others.

Children were able to pinpoint areas which they particularly enjoyed, such as games and painting. Fredrickson's (2001) 'Broaden and build' model also notes that positive emotions bought about through play, creativity and interest broaden people's ability to assimilate information, increase attention spans and build on intellectual capacity. Additionally, Krapp

*et al.*, (1992) and Pekrun, (1992) found that enjoyment and interest in a topic can lead to increased concentration and willingness to learn.

Studies show that enthusiastic students are more engaged and have better recall (Turner & Meyer, 1999). Ballantyne and Packer (2005) found that emotional engagement impacts positively on knowledge, attitudes and behaviour, resulting in longer lasting behaviours, which is important for EE campaigns where continued outreach is difficult due to funding and resources. These theories may be as applicable to adults as to children and therefore it may be beneficial to focus on enhancing the experiential aspect of adult EE campaigns. Future campaigns may wish to measure people's experience of campaigns as an outcome and an indicator of success.

#### **5.2.5. Variables impacting experience of the campaign**

Village of residence impacted on childrens' experience of the campaign. Children from Azhybai did not rate the experience as highly as children from other villages. Interestingly, these children also have lower knowledge scores and less positive attitudes.

There may be several reasons for this finding; Saiga Day and the education day in Azhybai did not run as smoothly as in other villages. The ACBK reports that this was because of the large number of children at both events, yet there was a lack of volunteer helpers which impacted on their running. Ni *et al.*, (1999) state that psychological factors such as previous attitudes, demographics and motivations impact interpretation of a campaign. Notably, one child reported that he had seen saiga as his father bought them home often, possibly normalising the act of poaching. It is possible that these inherited values and early experiences have already influenced children's attitudes and knowledge.

#### **5.2.6. Campaign success**

To conclude, the campaign can be seen to have been a success if it is judged on its ability to positively change attitudes, increase knowledge and affect behavioural intent of those who came into contact with it. However, if success is also judged on the capacity of the campaign to reach as wide an audience as possible and to harness the multiplier effect we need to assess how many people come into direct contact with the campaign. These data show that

to this extent it has been less successful; as only 3% of the adult population in the target villages had been directly reached. It is important to gain as much ROI and reach as wide a target audience as possible. Hence creating better awareness of the events themselves and drawing people to is essential, perhaps through sending invitations to each household or by putting posters in shops, libraries and schools.

## 6. Implications for future conservation activities

The findings of this study have found several areas where the results have implications for future work in the region, as well as the wider conservation community, figure 6. illustrates how implications and future work tie together in the framework of the TPB, in summary these are:

- In this region saiga are seen as holy animals and valued as part of the natural beauty of the steppe, it would be wise to use these feelings to apply social pressure to stop poaching.
- There is the potential to spread campaign messages to many more individuals. Hence awareness of events needs to be coordinated centrally, invitations need to be sent to each household and posters need to be placed in communal areas to maximise attendance at events.
- Awareness materials must be targeted, age relevant and localised. Clearly transmitting key messages.
- Campaigns need to be audience specific, with different materials and events arranged to capture the imagination of each audience, to inspire and emotionally engage, e.g engaging teenagers an 'activity' as survival skills training should be arranged on the steppe.
- Additional outreach needs to be arranged in order to build on the goodwill towards saiga, harnessing people's WTH. Local groups could be formed and village-led awareness events arranged, and an anti-poaching club formed with possible reward systems.
- WTH should be taken into account as a proxy for behavioural intent when working in areas of economic depression and low income.
- Sheppard (1999) proposed that conservation move from a system of evaluating outputs to one of evaluating outcomes. Hence people's experience of the campaign could be used as an indicator for success of a conservation project where relevant, as it helps measure how the campaign is received by local people, and may help in an adaptive management scenario.
- Children especially, but people in general, can act a multipliers of information, so careful consideration should be taken before deciding on type of intervention to

implement for maximum return on investment (ROI). Be it one which focuses on children, in order to disseminate information and act as catalysts for change in communities, one which utilises the mass media to disseminate information, or one which focuses on key multipliers within a community.

- Care needs to be taken to understand the dynamic between communities local and institutions before the implementation of a campaign, so that that any mistrust of institutions can be accounted for. Additionally, if third parties i.e. local government, are to take a role in implementation of any stage of the campaign time and effort must be invested by the implementers to ensure that they are fully bought-in to the process, that they are clear on the actions they are expected to carry out, and that they are given every tool necessary to enable them to easily and effectively fulfil their role.

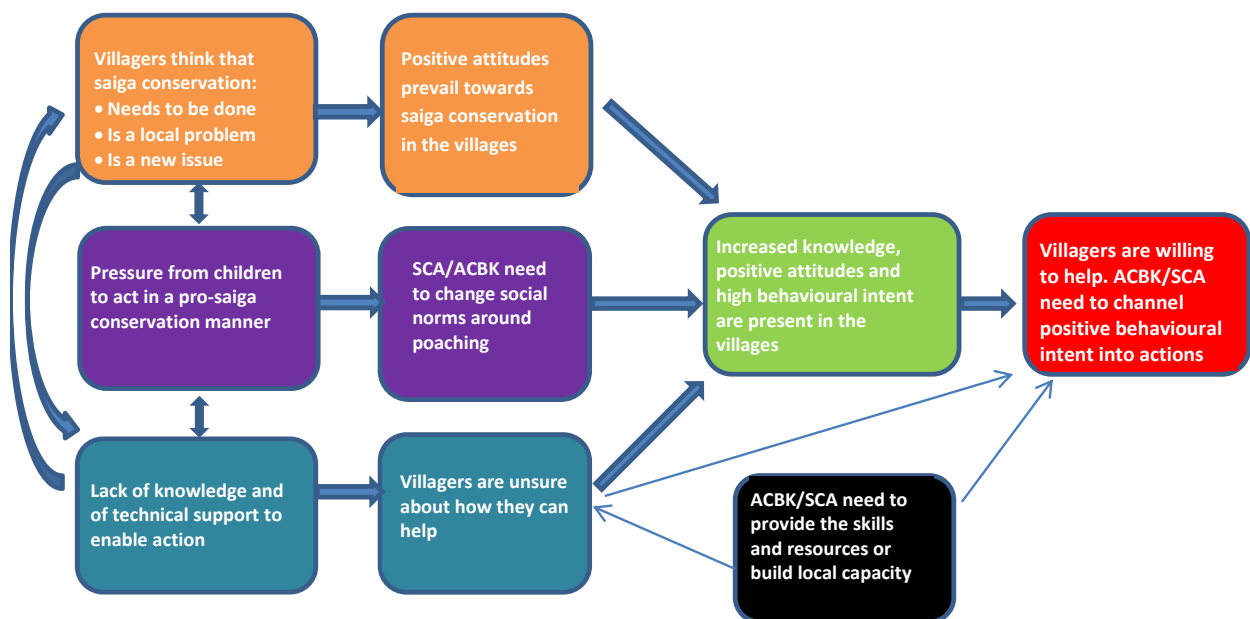


Figure 6. Ajzen's (1991) Theory of Planned Behaviour has been adapted and shows results from the study applied to each area.



## 7. Summary of findings

It is helpful to review the hypotheses in table 7. for an overview of the summary of findings of the present study.

Table 7. Findings of the present study in light of the hypotheses.

Hypotheses	Findings of study
<p>H1. Participants' increased knowledge since programme inception has led to more supportive attitudes and behavioral intent towards saiga conservation.</p>	<p>The study provides evidence that is consistent with H1. An increase in knowledge, attitudes and behavioural intent from pre to post campaign was found. This may indicate that the campaign has improved the variables. And possibly that knowledge has led to more favourable attitudes and behavioural intent, (Although confirmation of this latter fact would require more research).</p>
<p>H2. Increased exposure to saiga and favourable socio-economic situation lead to positive behavioural intentions.</p>	<p>Evidence for Hypothesis 2 has been partially provided. Surprisingly, wealth did not have any significant effect on people's WTP, the amount they are WTP or their WTH. Additionally, although exposure to saiga was found to be a significant variable affecting peoples' behavioural intent in the baseline study, this was not found to be true in the post campaign data. This may be due to the fact that significantly fewer people in the post campaign survey had come into contact with saiga, or an effect of measuring unpaired samples.</p>
<p>H3. Exposure to and positive of experiences of the campaign may result in greater knowledge, positive attitudes and increased pro-saiga behavioural intention.</p>	<p>This hypothesis was supported by the adult data in that those with positive attitudes and or greater knowledge exhibited more favourable behavioural intent.</p> <p>Adults who attended the awareness evening exhibited more favourable behavioural intent than others. However in the absence of a true paired sample it is not possible to confirm whether they came to the event as they were favourably inclined before the campaign, or if the campaign helped develop these favourable attitudes.</p> <p>Children's positive experiences of the campaign were seen to be correlated with significantly increased knowledge scores. However, this could not be proven for adults.</p>

## **8. Limitations and implications for future research**

It is important to draw the reader's attention to limitations in the study when considering the research findings and issues such as their generalisability and reliability. There was a small sample size for those who had attended the campaign and this may have had an impact on the results as not all attendees were interviewed. Replicating the research with larger sample sizes is to be advised.

More research into how much knowledge, attitude and behaviour change arising from different types of campaign (Howe 2009) would be of interest, e.g. as this study highlighted, not all knowledge was gained first-hand through attendance at the event, but through friends and family members it would help implementers understand which types to interventions to invest in. Therefore a possible study would be to map knowledge transfer between community members, as per Kivisto (2005) or Emery *et al.*, (2002), who found that knowledge of special forest products was nearly always shared between generations and within social networks; E.g., one man described how he learnt about wild medicinal plants from his mother and how this knowledge was shared among siblings. Others shared information with extended family groups who, in turn, pass that information on. This could help conservationists to understand who key disseminators of information are, and together with other research into understanding appropriate communication techniques, launch highly targeted, cost effective interventions.

Most research about how young people gather information originates from Europe where they have access to 'new media'. Access to the internet is often not technically possible in remote villages, so research into how 'youth' in isolated communities gather knowledge about conservation issues is needed.

Research into what makes someone more predisposed to show environmental stewardship is sometimes inconclusive and conflicting, notably this study conflicts with some existing results. It would be beneficial to investigate this area further to ascertain key variables, be they age (Kruse, 1999), gender (Jacobsen, 2008), education (Hines *et al.*, 1986/7) or employment (Van Liere & Dunlap, 1981), and to investigate whether influence of variables changes according to situation, intervention or location. Additionally, it may be of interest

to study if more/less direct contact with the species in question influences acquisition of knowledge, attitudes and behaviour.

It would be beneficial for the conservation community to establish a set of accepted scoring systems to evaluate indicators. As currently, studies such as this one and that of (Howe, 2009; Robertson, 2009), utilise subjective scoring systems for indicators such as 'experience of campaign' and 'attitudes'. Consequently research is not easily replicable, making comparisons between campaigns difficult. In this vein as 'experience' of the campaign was found to be a variable associated with knowledge and attitudes, further evaluation into its robustness as an indicator for success should be considered.

The idea that correlation and causation are connected is certainly true; where there is causation, there is likely to be correlation, but not necessarily vice versa. However, such inferences are not always correct as there are often other possibilities. For example, Hsiang *et al.*, (2011) writing in *Nature*, correlated civil wars in countries throughout the world with the El Nino Southern Oscillation. Using data from 1950 to 2004, (a relatively short period), they showed that the probability of civil conflicts arising throughout the tropics doubles during El Nino years relative to La Nina years. Inferring causation they mention that the stability of societies relates to the climate. However, they do not take into account any other variables such as the global economy, politics and demographics.

Correlations can occur by chance, as DuHamel (2011) proved when he correlated U.S. first-class postage rates versus temperature for the period 1880 to 2005; showing that as global temperatures rose so did postage rates. Hence, there can clearly be correlation without causation.

Although this study shows several correlations it is important to note that this does not imply causality and that further research must be done to investigate the underlying causes to establish meaningful, statistically valid connections between phenomena. A paired sample and a control group would help in understanding the underlying reasons for correlation and to establish causality. For example, carrying out multivariate analysis and applying Hill's Criteria of Causation (1965) would be relevant in this aim.

Hill's Criteria of Causation (1965) outlined the minimal conditions needed to establish a causal relationship between two items, originally intended for medical science, but equally relevant to social science and could be used to establish causality and would be interesting future research. These criteria comprise: Strength of association, consistency, specificity, temporal relationship, biological gradient, plausibility, coherence, reversibility and consideration of alternate explanations.

Additionally, as there are multiple factors affecting how people form attitudes and behave, future research in this area would benefit from multivariate analysis (Howe, 2009; Damerell, 2009) to analyse the linear components, reduce dimensionality of the data set and identify meaningful underlying variables such as level of education, employment and the relationships between variables. This would be of interest to future EE campaigns as could help implementers better understand the relationship between variables and to structure campaign materials and content in an insightful and targeted way.

There is little research in conservation as to people's motivation to be WTH. Measham and Barnett's (2008) research into motivations in voluntary work found that a significant factor was the role community education played in actualizing voluntary work. An understanding of these motivators would help to mobilise volunteers. Additionally, as this study has shown WTH increased post campaign, it would be of interest to carry out research WTH as a measure of behavioural intent, as this may be a strong indicator where the economy makes it hard for people to consider using WTP as an indicator.

Additional research is needed into how length of time after intervention effects behavioural change, and 'actual' behavioural change as opposed to proxy measures (WTH/WTP) and knowledge-based assessments of interventions. For example, testing people's recall of information is a measure of knowledge retention, and cannot necessarily be equated with pro-environmental behaviour or attitudes.

(Christie, 2007) found disparity between hypothetical and actual WTP bids for Red Kite conservation in Wales. The survey indicated that hypothetical WTP was three times greater than the mean value of actual donations. Further investigation identified that an underlying cause of this disparity stems from respondents overstating their intention of pay.

Studies have shown that correlation between attitudes and behaviour is greater the smaller the time lag between stated WTP bids, or questions regards behavioural intent, and action (Seth, 1973). Many studies such as this one, evaluate the effectiveness of campaigns shortly after interventions, and can only hope to produce short-term 'snap-shots' of outcomes. Few campaigns' long-term success are measured and this is a research area which would benefit conservation interventions, as knowing how, as a result of an intervention, behaviour 'actually' changes in the long-term and impacts the conservation objective. Additionally, few long-term evaluations of the effects of EE exist, be it changes in behaviour or attitudes, or importantly in the actual conservation of the subject in-hand; and research is needed into the ROI of EE to this extent.

As no baseline data were available for children the present study is limited in its investigation of acquisition of knowledge and attitude formation in relation to EE. A long-term study into early childhood experiences with EE campaigns is desirable, to assess whether pro-environmental attitudes and behaviours are developed as a result of EE and if they are maintained long-term.

Relating to measuring long-term success is the evaluation of relative success of different types of intervention. It would be useful to understand the effectiveness of different approaches and more research into this area is needed. For example Disinger (1982) found that EE in nontraditional settings outside the classroom were more successful than those in the classroom, yet Zelezny (1999) found that the reverse was the case. Dresner and Gill, (1984) found that pro-environmental behavior increased through 'experiential' learning such as active participation in environmental activities outside the classroom, more research into which interventions are successful as well as cost-effective is needed.

There is no way to gauge retrospectively how much of an effect my presence at the interviews played, but there is the possibility of socially desirable responding regarding the interviewers who were part of the team arranging the events. Respondents hence may not have wanted to have given negative answers. It may be of interest in future evaluations to ascertain the level of interviewer influence by having 'outsiders' sit in on interviews by having them there during pre and post interviews with a paired sample and evaluating significance in change compared to those interviews that outsiders do not attend.

Finally, it was noted that the presence of 'westerners' lent the campaign 'gravitas' in the eyes of local people, it may be of interest to carry out research into the effectiveness of campaigns run in conjunction with 'foreigners' versus those run entirely by local NGOs and employees.

## **9. Conclusion**

To conclude, the study highlights a successful campaign. Which, through the ability to compare baseline data with post campaign data, uncovered more information and suggestions for future interventions than was anticipated; which may help the wider conservation debate.

On a regional level, the feelings of goodwill towards the campaign and saiga conservation in general lead to a feeling of optimism for the role of local people in the conservation of the saiga. If their enthusiasm can be harnessed in a timely manner and the excellent foundations built by the campaign to date are built upon through increased, regular contact with the communities, social norms can be influenced and poaching reduced through civilian eco-awareness and mobilisation.

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## Appendices

### Appendix 1 – Questionnaires

Original Adult questionnaire:

#### **SURVEY OF LOCAL POPULATION'S ATTITUDE TO THE SAIGA CONSERVATION PROBLEMS (SPECIFYING THE MEANS OF LIVING)**

Interviewer:  
Settlement:

Date:

Questionnaire No.:

**Data on the household demographic composition** (The first part of questions are for the house owner. These data may be provided by other member of the family)

#### ***How long have you (house owner) lived in this settlement?***

1) 0-5 years; 2) 6-10 years; 3) 11-15 years; 4) 16-20 years; 5) 21-25 years; 6) 26-30 years; 7) > 30 years.

#### ***Where had you lived before?***

1) neighbouring district; 3) other oblast (region); 4) other country.

	<b>oblast</b>
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#### ***Why did move to this settlement (long-term reasons for changing the place of residence)?***

- a) was born here
- b) to join the relatives
- b) to work here
- d) other \_\_\_\_\_

#### ***House owner data***

**gender:** 1)male      2)female

**age:** 1) under 20  
2) 21-40

3) 41-60  
4) above 60

**education:** 1) higher  
2) uncompleted higher

3) vocational secondary  
4) secondary  
5) post-primary  
6) primary

**ethnicity:** \_\_\_\_\_

**number of family members:** \_\_\_\_\_

(how many persons are living with you in the house)

**social status:**

- 1) unemployed
- 2) employed
- 3) retired
- 4) secondary or high school student
- 5) college or university student

6) other \_\_\_\_\_

**2) This household's income**

**What are the main activities (income items) and expense items of the household?**

Activity/income item	Income from each type of activities (KZT per year)	Expense items	Expense (KZT per year)

**Do you keep livestock in your household? Please specify how many and what kind of animals.**

Livestock (farm animals and poultry)	Number of livestock	Number of livestock slaughtered per year		Market price of one animal	Income from other products obtained from animals (e.g., wool, dairy products) per year or, if more convenient, by months.
		For the family	For sale		
1) cattle					
2) sheep, goats					
3) chickens					
4) camels					
5) horses					

**Does the family buy meat? If YES, what kind of meat, and how much money does the family spend per month to buy meat?**

**NO- 0      YES-1      \_\_\_\_\_ KZT/month**

**Do you have any vehicles in your household?**

**NO-0      YES-1**

**If YES, how many and what kind of vehicles?**

Transportation vehicle	number	year of manufacture
motorcycle		
car		
Niva, UAZ minivan, etc		
bus, Gazel van, etc		
truck and agricultural machinery		

**Access to information**

**Where do you obtain information (news, health, agriculture, hobby, etc)?**

No.	information source	1	2	3
1	talking to friends or family members			
2	newspapers			
3	magazines			
4	radio			
5	television			
6	library or books			
7	talking to specialists (e.g., a doctor)			
8	other (please specify):			

**This household changes and problems**

**Please give your evaluation to the past 12 months: how good were they in your opinion from a financial perspective?**

A. Very bad    B. Bad            C. Normal    D. Good    E. Very good

**Are you currently facing any problems related to ensuring your household members' welfare?**

**NO- 0            YES – 1**

**4.5 What do you think needs to be done to improve life in your settlement?**

- creating new job \_\_\_\_\_wage size
- new opportunities for obtaining education
- new opportunities for receiving medical treatment
- developing roads and communications
- regular payment of wages, pension, child allowances
- developing agriculture
- raising the amount of wages, pension, child allowances
- culture and leisure
- other \_\_\_\_\_

**B. SURVEY OF LOCAL POPULATION'S ATTITUDE TO THE SAIGA CONSERVATION PROBLEMS**

**Dynamics of the saiga population number on the territory adjacent to the settlement**

**Did you see the saigas on this territory before 1991?**

**YES-1 NO- 0**

**If YES, in which months did YOU see the saigas on this territory before 1991?**

01	02	03	04	05	06	07	08	09	10	11	12	all year round

**Did YOU see the saigas on this territory last year?**

**YES - 0    NO- 1**

**If YES, in which months?**

<b>01</b>	<b>02</b>	<b>03</b>	<b>04</b>	<b>05</b>	<b>06</b>	<b>07</b>	<b>08</b>	<b>09</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>all year round</b>

**Did YOU observe gathering of saigas for the period of calving on this territory before 1991?**

**YES -1      NO - 0**

**Did YOU observe gathering of saigas for the period of calving on this territory last year?**

**YES -1 NO - 0**

**How many saigas moved around this territory before 1991? And currently?**

	before 1991	currently
a) Hundreds of thousands		
b) Tens of thousands		
c) Thousands		
d) Hundreds		
e) Less than a hundred		
f) None		

**On the whole, do you think that any changes have occurred related to the number of the saigas, their behaviour, migration routes, gender composition, etc ON THIS TERRITORY (specify the distances from the settlement) after 1991?**

**YES -1      NO - 0      DON'T KNOW - 2**

**If YES, what exactly has changed? Why did these changes occur?**

Type of change	When did it occur?(year)	Why did it occur?	Options:	
<b>1)</b> change in the number of saigas			<i>poachers</i>	
			<i>predators</i>	
			<i>climate factors</i>	
<b>2)</b> change in the number of horned saigas			<i>anthropogenic effect on the area</i>	
			<i>other biotic factors (bad pastures)</i>	
<b>3)</b> behaviour changes				
<b>4)</b> migration routes changes			<i>other (specify)</i>	

**1.10. What do you think are the reasons that make people go poaching?**

unemployment	
increased price of horns	
increased price of meat	
poor protection of the saigas	
no prevention of horns and meat transportation	

imperfect legislation	
irregular payment of wages, pension, child allowances	
other	

**1.11. Do you think that the saiga hunting is:**

- a) permitted by law
- b) prohibited by law
- c) don't know

**1.12. Do you have sufficient information about the saiga biology, ecology, and conservation measures?**

**YES - 1                      NO- 0**

**2) General attitude to the saigas**

***If no saigas remained in the world (e.g., they became extinct), would you be concerned about it?***

- No.
- Yes, a little.
- Yes, to a certain extent.
- Yes, very much.

***Would YOU personally be ready for taking some actions to prevent the saiga extinction?***

**YES -1                      NO - 0**

***If YES, what kind of assistance can you offer for the purpose of saiga conservation?***

- patrolling and monitoring (new guard)
- raising saiga cubs (at home and in a nursery)
- campaigning (at school, in printed mass media, on TV)
- killing wolves
- feeding saigas in their natural habitat
- providing financial assistance (how much money can you provide for the saiga conservation)

<b>KZT per year</b>	<b>Ready to pay</b>
0	
50	
100	
200	
400	
800	
1,600	
3,200	
6,400	
12,800	
25,600	
50,000	

>50,000	
---------	--

other \_\_\_\_\_

**Why are the saigas killed at present? Evaluate (in percentage points) each case of use.**

Using the product obtained from the saigas	% of all the saigas killed for this purpose at present	% of all the saigas killed for this purpose in the past
Selling horns		
For personal consumption		
Selling meat		

**Do you think the saigas are hunted on the territory adjacent to your settlement?**

**If YES, could you roughly estimate a possible number of hunters, and where they are from:**

	at present	in the past
Yes		
No		
Don't know		
Number		

**Where do you think it is possible to buy the products obtained from the saigas? What is the price of 1 kg of horns and meat?**

No.	where	meat (carcass, kg, how many kg in the carcass)	1 kg of horns
1	your settlement		
2	neighbouring settlements		
3	Atyrau		
4	Kyzylorda		
5	Almaty		
6	Russia		
7	don't know		

### **Saiga Population Management and Protection**

#### **3.1 Do you know about any measures aimed at the Ural saiga population management? Who are they organized by?**

Territorial inspection of the Forestry and Hunting Committee

Okhotzooprom

Police

mass media

inspectors (don't know which organization)

other \_\_\_\_\_



**3.2 What do you believe is necessary to do for the saiga conservation in the future?**


**3.3. Do you know about the mass loss of the saigas in May 2010? What do you think are the reasons of this mass loss?**


## Post campaign questionnaire

### SURVEY OF LOCAL POPULATION'S ATTITUDE TO THE SAIGA CONSERVATION PROBLEMS

Interviewer:  
Settlement:

Date:

Questionnaire No.:

#### Saiga Population Management and Protection

**Have you seen saigas on this territory in the last 12 months?**

YES - 0      NO- 1

**If YES, in which months?**

Jun e	Jul y	Au g	Sep t	Oc t	No v	De c	Ja n	Fe b	Marc h	Apri l	Ma y	Jun e	All yea r

**1.2 Did YOU observe gathering of saigas for the period of calving on this territory last year?**

YES -1      NO - 0

**1.3 Have you observed gathering of saigas for the period of calving on this territory this year?**

YES -1      NO - 0

**1.4 On the whole, do you think that any changes have occurred related to the number of the saigas, their behaviour, migration routes, gender composition, etc ON THIS TERRITORY (specify the distances from the settlement) in the last 20 years?**

YES -1      NO - 0      DON'T KNOW – 2

**If YES, what exactly has changed? WHEN? And Why did these changes occur?**

Type of change	When did it occur? (year)	Why did it occur?	Options:	
			poachers	
1) change in the number of saigas			predators	
			climate factors	
			anthropogenic effect on the area	
2) change in the number of horned saigas			other biotic factors (bad pastures)	
3) behaviour changes				

4) migration routes changes			other (specify)	
-----------------------------	--	--	-----------------	--

**1.6 Do you know about the mass loss of the saigas in May 2010? What do you think are the reasons of this mass loss?**


**1.7 What do you think the reason is for the recent loss in May 2011?**

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**1.8 Do you think that the saiga hunting is:**

- a) permitted by law
- b) completely prohibited by law
- c) permitted only under certain circumstances
- d) don't know

**General attitude to saigas**

**2.1 Do you know about any measures aimed at the Ural saiga population management?**

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**2.2 Who are they organized by?**

Territorial inspection of the Forestry and Hunting Committee  
 Okhotzooptom  
 Police  
 mass media  
 non-governmental conservation organisations  
 inspectors (don't know which organization)  
**other** \_\_\_\_\_

**2.3 If no saigas remained in the world (e.g., they became extinct), would you be concerned about it?**

- No.
- Yes, a little.
- Yes, to a certain extent.
- Yes, very much.

**2.3 Would YOU be ready to take action to prevent the saiga extinction?**

YES -1

NO - 0

**2.4 If YES, what kind of assistance can you offer for the purpose of saiga conservation?**

- ecological monitoring
- campaigning (at school, in printed mass media, on TV)
- talking to friends and family about saiga needs
- providing financial assistance (how much money can you provide for the saiga conservation)

*The current saiga population in this area is considerably smaller than historic levels and is still under pressure from hunting and other factors. There is a risk that if conservation action is not increased, the saiga may be lost from this area of Kazakhstan.*

*An annual household voluntary contribution is one possible method for raising money to support the conservation and protection of the saiga antelope.*

*Which of the amounts below best describes your household's maximum willingness to pay, every year, through a voluntary contribution, to prevent the loss of saiga from Ural region? Please think carefully about how much you can really afford and where the additional money would come from and try to be as realistic as possible.*

*Place a tick (√) next to the amount your household would be willing to pay. When you reach an amount that you are not sure of paying then leave it BLANK. When you reach an amount that you are almost certain you would not pay, then place a cross (x)*

KZT per year	Willingness to pay
0	
50	
100	
200	
400	
800	
1,600	
3,200	
6,400	
12,800	
25,600	
50,000	
>50,000	

other \_\_\_\_\_

**Follow up questions**

Possible reasons why interviewee does NOT want to pledge any money (True √; False x)

- Our household cannot afford to pay
- I am not very interested in saiga antelope and feel that their conservation is not a priority
- I don't believe a household contribution scheme is workable
- The government or international community should pay for this
- I need more information/time to answer the question

Possible reasons why interviewee wants to pledge an amount (True √; False x)

I am interested in the saiga antelope and feel that it is important to conserve them  
 I get satisfaction from giving to a good cause  
 We should protect the saiga for future generations  
 I feel we should protect our wildlife and environment in general

**2.5 What do you think is necessary to do for saiga conservation in the future?**


**Knowledge and opinion / public awareness**

**3 Do you have sufficient information about the saiga biology, ecology, and conservation measures?**

YES - 1

NO- 0

**Before January this year, when was the last time that you received any information about saiga antelopes?**

\_\_\_\_\_

**Since January this year have you received/seen information of any sort about saigas (excluding saiga day)?**

YES -1

NO – 0

**3.3 If YES to the above, please answer the following;**

When was the information received	Where did you see the information? TV, Radio, posters, presentations, newspapers etc	Who did you receive information from? (children in the household, friends, work colleagues, ACBK student)	What was it about? (ecology, poaching, culture etc.)	How many times did you receive information	Any other info

**3.4 Was the information: (tick all relevant answers)**

Aimed at me	
-------------	--

Not aimed at me	
Not interesting or useful	
Interesting and useful	

**3.5 Did you learn anything new about Saiga from this information?**

YES 1

NO 0

*If yes, what was this?*

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**3.6 Do you more positively inclined toward saiga and their management, since you saw the information.**

YES 1

NO 0

**3.7 Are Saigas important to you?**

YES 1

NO 0

*Why is this?*

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**4) How information was given to you – campaign only (not Saiga day)**

**4.1 Did you go to the saiga information event?**

YES 1

NO 0

**4.2 How did they give you the information?**

*Left it with you*

*Talked through it*

*Other* \_\_\_\_\_

**4.3 How do you feel about the way in which the information about saigas was given to you this year?**

A i. Made me interested to learn more

ii Didn't interest me

iii Other \_\_\_\_\_

B i. Difficult to understand

ii Easy to understand

C i. Took too long to give me the information

ii Took the right length of time

D i. It was given to me by people who knew the subject well, were enthusiastic and could answer my questions

ii. It was given to me by people who lost my interest

Other \_\_\_\_\_

E i. I feel that they respected my opinions

ii. I don't feel that my opinions were respected

**4.4 Do you think that the information given to you was:**

Important - 1                      Not important - 0

*Why is this?*

---

**4.5 How would you rate this experience?**    *Very bad            bad    neutral    good  
excellent*

*What could have been done differently to make the experience better for you?*

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**5) Content of material in campaign only**

**5 Which of the following describes the information about saigas you have seen?**

A i. I feel I the information has helped me know enough to make informed choices about saiga

ii. I still feel like I would like to know more

iii. I don't feel like I learnt anything new

B i. the information was interesting

ii. not interesting

C i. it was totally new information

ii. there was some new information

iii. there was no new information

D i. information was complicated and difficult to understand

iii. it was meaningful and easy to understand

E i. information was relevant to me

ii. information was irrelevant to me

F. who do you think the information was aimed at?

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**6) What can we do to improve?**

**6 What can we do to make information more relevant to you?**

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**6.1 What could be done better?**

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**6.2 What would you like to know more about?**

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**7) Saiga day**

**7 Have you heard about Saiga day?**

YES 1 NO 0

**7.1 Did you or any member of your family attend?**

YES 1 NO 0

*If no, why not?*

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**If yes, who?      Myself      my child      spouse      other**

***If you personally attended please answer the following:***

***When was the event held?*** \_\_\_\_\_

***Where was it held?*** \_\_\_\_\_

***What was it in aid of?*** \_\_\_\_\_

***Who was it aimed at?***

***Children teenagers families everyone other*** \_\_\_\_\_

**7.2 Did your children learn anything new about Saiga at the event?**

YES 1 NO 0

*If, yes, can you describe what this is?*

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**7.3 Did you, personally, know this information before Saiga day?**

YES 1 NO 0

**7.4 Did you learn anything new about Saiga at the event?**

YES 1 NO 0

*If yes, what was this?*

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**7.5 Have your attitudes towards Saiga changed as a result of saiga day?**

YES 1 NO 0

***If yes, how?*** \_\_\_\_\_

***If no, why not?*** \_\_\_\_\_

**7.6 Will this change anything that you do?**

YES 1 NO 0

*If yes, in what way?* \_\_\_\_\_

**7.7 Do you think the event achieved its aims of raising awareness of Saiga related issues in an informative and engaging way?**

YES 1 NO 0

***Reasons for your answer***

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**Gender:**

- 1) male
- 2) female

- age:**
- 1) under 20
  - 2) 21-40
  - 3) 41-60
  - 4) above 60

- education:**
- 1) higher
  - 2) uncompleted higher
  - 3) vocational secondary
  - 4) secondary
  - 5) post-primary
  - 6) primary

**social status:**

- 1) unemployed
- 2) employed
- 3) retired
- 4) secondary or high school student
- 5) college or university student
- 6) other \_\_\_\_\_

**ethnicity:** \_\_\_\_\_  
 \_\_\_\_\_

**number of family members living in the house:**
**Are there any children in the household?**      NO-0      YES-1

 If yes, please state number of children and ages  
 \_\_\_\_\_

**Where do you obtain information (news, health, agriculture, hobby, etc)?**

No.	information source	
1	talking to friends or family members	
2	newspapers	
3	magazines	
4	radio	
5	television	
6	library or books	
7	talking to specialists (e.g., a doctor)	
8	other (please specify):	

**2) Household income**
**What are the main activities (income items) and expense items of the household?**

Activity/income item	Expense items

**Do you keep livestock? If yes please specify below**

Livestock (farm animals and poultry)	Number of livestock	Number of livestock slaughtered per year		Market price of one animal
		For the family	For sale	
cattle				
sheep, goats				
chickens				
camels				
horses				

***Do you have any vehicles in your household?***

***NO-0      YES-1***

***If YES, how many and what kind of vehicles?***

Transportation vehicle	number	year of manufacture
motorcycle		
car		
<i>Niva, UAZ minivan, etc</i>		
bus, <i>Gazel</i> van, etc		
truck and agricultural machinery		

**3) This household changes and challenges**

***3.1 Please give your evaluation to the past 12 months: how good were they in your opinion from a financial perspective?***

A. Very bad    B. Bad            C. Normal    D. Good    E. Very good

***Thank you for your time, your answers are valuable to us and are one of the ways which will help us to ensure that conservation of your local saiga population is managed effectively.***



If yes, what was this?

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**2.4. Where did you learn this?**

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**2.5. How much do you think you have learnt about saiga this year?** a) A lot very much      b) not very much  
c) nothing

**2.6. What do you think about saiga since you learnt about them at school and at Saiga day?**

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**2.7 Have you talked to anyone at home about Saiga day?**

YES 1

NO 0

What did you tell them?

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**2.8 If there were no Saiga in the world how would you feel?:**

- a) It wouldn't bother me
- b) I would be sad/ upset
- c) A little upset but not too much
- d) I'd be very upset

**2.9 Can you tell me a few things about saiga?  
What do they eat?**

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**Which countries do saigas live in?**

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**Can you tell me something interesting about saiga?**

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**What are saigas biggest problems (name 3)**

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**What can we do to help them?**

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**What was saiga day was like?**

**Did you want to go?**

YES 1

NO 0

DON'T KNOW 0

**Why was this?**

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**How would you describe Saiga day? (Tick as many as you like)**

- ai) A fun day
- a ii) A fun day, and I learnt new things about saiga
- a iii) I didn't like it
- iv) boring

**3.3 Who do you think Saiga day is for?**

- a) Children younger than 10
- b) children over 10
- c) adults
- d) everyone

**3.4 What do you think about the teachers at saiga day? (Tick as many as you like)**

- They didn't know anything about Saiga
- They knew lots about saiga
- I liked the way they told me interesting things about saiga
- They were good fun
- They were boring teachers

**3.5. What did you do at Saiga day?**

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**3.6 What was your favorite part of Saiga day?.**

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**3.7 Were there any parts of the day you didn't enjoy?**

YES 1 NO 0

*If so what where they?*

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**3.8 Did you prepare anything at school for Saiga day (plays, costumes, paintings etc)**

YES 1 NO 0

*What was this?*

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**3.9 Next year would you:**

- a. Like to be more involved
- b. The same
- c. Less involved
- d. Don't want to take part
- e. Other\_\_\_\_\_

**3.10 What would you like to do?**

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**3.11 What do you think we can do better for saiga day next year?**

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**Thank you very much for giving us answers to our questions and helping us to help protect the Saiga**

