

The Impact of Community Conservation Initiatives in the Uzbek Ustyurt



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Introduction

Project Background

The saiga antelope (*Saiga tatarica*) is a migratory ungulate that inhabits the semiarid desert regions of Russia and Central Asia (Bekenov *et al.* 1998). The only surviving member of its genus, *S. tatarica* exists in two subspecies; *S. t. mongolica* found only in Mongolia and four populations of *S. t. tatarica*, found in Kazakhstan, Russia and Uzbekistan, two of which are transboundary (CMS 2010). After the collapse of the Union of Soviet Socialist Republics (USSR) in 1991 saiga populations decreased in size rapidly as a result of dramatically elevated levels of illegal hunting within saiga range states. This increase in uncontrolled hunting of saiga was caused by collapses in the rural economies of former Soviet states and the simultaneous removal of funding for saiga management (Milner-Gulland *et al.* 2001). In the decade after the collapse of the Soviet Union saiga populations declined by more than 90%; a population crash which resulted in the species being listed as Critically Endangered by IUCN - the World Conservation Union (IUCN 2007). In 2006 the total population of *S.t. tatarica* was estimated at fewer than 70,000 animals; less than 8% of average 1980-1990 levels (CMS 2006).



The Uzbek Ustyurt Plateau

Notable progress has been made in formally recognising the threat to the saiga. In 1995 the saiga was included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in an effort to control the trade in Saiga horn and in 2002, the Convention on Migratory Species (CMS) listed *S. t. tatarica* on its Appendix II. Additionally a foundation for international collaboration has been established through the coming into force in 2006 of a Memorandum of Understanding (MOU) under the CMS. A roadmap for saiga conservation laid out by the signatories of the MOU recognises the

widely reported need for community-based approaches in scenarios where socio-economic factors are driving exploitation (Pimbert & Pretty 1995; Mainka & Trivedi 2002).

This study aims to provide support for the future implementations of community outreach strategies for the conservation of saigas in Uzbekistan. In line with specific recommendations laid out in the action plan for saiga conservation (CMS 2006), a community engagement initiative featuring schools-based environmental education, a saiga celebration event (Saiga Day) based at village schools, an alternative livelihood scheme and participatory monitoring of saiga antelopes by community members have been established in the Uzbekistan portion of the Ustyurt Plateau. This study assesses the education-based activities and alternative livelihoods scheme in terms of their conservation impact. The outcomes of the education-based intervention are compared with a counterfactual, an analogous situation where the intervention has not been employed. Such analysis provides strong evidence for the effectiveness or inadequacy of the employed intervention. Whilst requiring an initial investment of time and resources a critical evaluation helps to ensure that the maximum conservation benefits are being achieved per unit cost (Ferraro & Pattanayak 2006) and provides an evidence base on which decisions about future actions can be based.

Environmental education as an outreach strategy

Environmental education (EE) is a key strategy available to conservation practitioners (Salafsky *et al.* 2002). It has been shown to be capable of changing recipient knowledge (Vaughan *et al.* 2003; Trehwella *et al.* 2005) and positive correlations have been shown between environmental knowledge and attitudes (Bradley *et al.* 1999; Aipanjiguly *et al.* 2002). Children are a frequent target audience for environmental education programs because attitudes toward the environment develop at an early age (Bryant and Hungerford 1977) and once formed do not change easily and have a strong influence on later thinking (Asunta 2003). Logistically children are frequently aggregated within educational institutions, reducing difficulties associated with EE programs for adults (Shin 2008). Children are less likely to have well-established environmentally harmful behaviours to "unlearn"; have a longer period to



Children going to school in Karakalpakia

influence environmental quality and are possible effective agents promoting environmentally responsible behaviour in others (Leeming and Porter 1997).

Attitudes and behaviour have a complex and debated causality (Azjen 1991; Holmes 2003; Leone *et al.* 1999). Whilst some studies hypothesise that the attitudes people hold will affect their exploitation behaviour (Infield 1988; Gibson & Marks 1995) others have shown that positive attitudes do not predict sustainable resource use (Ite 1996; Alexander 2000). As the drivers behind unsustainable exploitation vary between scenarios it is likely that the influence of attitudes on behavioural expression will similarly vary. The theory of planned behaviour suggests that attitudes are one of three key drivers of behaviour; in this study we also investigate the normative beliefs that are prevalent within the study communities. Normative beliefs can be described as an individual's perception of the opinion other people have towards a behaviour. Social norms have been shown to be important drivers of environmental behaviour (Barr 2007).

The number of critical appraisals of environmental outreach, especially environmental education, remains limited (Bride 2006). As a result community engagement programs and awareness raising initiatives may be assembled in an ad-hoc manner leading to a less than optimal conservation return for the financial and time costs they demand.

Alternative livelihoods as an outreach strategy

Few examples of case studies documenting the impact of alternative livelihood schemes on conservation behaviour exist in the published literature. Where critical assessments of alternative livelihood projects have been undertaken they reveal mixed success rates for the intervention strategy (Oates 1995; Abbot *et al.* 2001). Several studies suggest that alternative livelihood schemes alone have a limited impact in reducing unsustainable resource exploitation



Gas pipes and freight carriages, Jaslyk

(Sievanen *et al.* 2005; Oates 1995) with principal concerns being that alternative livelihoods have an indirect relationship to conservation and must integrate into a system of complex socio-economic interactions (Sievanen *et al.* 2005). Additionally, Baker (2004) highlights the importance of ensuring that biodiversity goals remain a priority focus, as

balancing the pursuit of disparate goals in multifaceted projects can result in conservation objectives being side-lined. Complex interventions such as alternative livelihood schemes are more likely to succeed when adaptive management is implemented based on a critical analysis of the intervention's likely long-term impacts (Wells & Lekies 2006).

Aims and objectives

In this study we assess the impact of two outreach schemes in the Uzbek Ustyurt: an environmental education program featuring schools-based activities and a community celebration event; and an alternative livelihood scheme based on the teaching of traditional embroidery and marketing of the products produced.

This investigation into the educational activities taking place in Uzbekistan aims to:

- Determine if a child's involvement with educational activities increases knowledge of saigas
- Assess student recognition of the role human actions play in reducing saiga numbers
- Explore which aspects of Saiga Day are resonating most strongly with participants
- Assess the viability of increased community participation in education-based outreach
- Determine the readiness of participating schools to increase the quantity and diversity of the environmental education activities they are undertaking
- Investigate adult attitudes towards saiga antelopes
- Assess the impact of education programs on adult social norms related to saiga exploitation

The progress of the embroidery schemes towards its goals was assessed by determining:

- Who is taking part in the embroidery program
- Whether participants are receiving the expected benefits of involvement
- What are the strengths and limitations of the scheme in its current format
- To what extent can the expected outcomes of the scheme be measured
- How can existing activities be modified in order to improve the influence of this programme on saiga conservation

By investigating the strengths and weaknesses of the school based programs and alternative livelihoods scheme we hope to facilitate the productive and efficient expansion of these initiatives, in order to maximise conservation impacts. This analysis is timely considering the large landscape-scale projects that have been recently established in the

Ustyurt plateau by several large international conservation organisations, with a particular focus on alternative livelihood interventions.

Project Background

The Ustyurt Plateau

This report focuses on the Uzbekistan portion of the Ustyurt Plateau population of *S. t. tartarica*; the population is transboundary between Kazakhstan and Uzbekistan with occasional records from Turkmenistan (none in the last 20 years). The Ustyurt Plateau is a temperate desert situated between the Caspian and Aral Seas in Uzbekistan and Kazakhstan.



Bostan; a small village on the Uzbek Ustyurt



Figure 1: The Uzbekistan portion of the Ustyurt Plateau. All villages referred to in this report can be located on this map.

The plateau covers an area of about 200,000km². The UNEP aridity index classifies large areas of the landscape as a drought zone, susceptible to degradation and desertification (Middleton & Thomas 1992). The human population of the Uzbek Ustyurt is estimated at approximately 10,000 people, the majority of whom live in villages along infrastructure corridors including the Kungrad-Beyneu railway and the Bukhara-Ural gas pipeline (Figure 1). Local employment is largely based on these two industries. The Ustyurt Plateau lies within the semi-autonomous Republic of Karakalpakstan. The ethnic makeup of Karakalpakstan contrasts strongly with the rest of Uzbekistan, with just over 40% of the 1.2 million residents classifying themselves as Karakalpak, a third ethnic Uzbek and the remainder ethnic Kazakh. The Karakalpak language is considered closer to Kazakh than to Uzbek and many Karakalpak people identify more readily with Kazakh culture than Uzbek.

Uzbekistan remains poorer and less developed than other *S. tatarica* range states (Table 1) with remote rural areas such as the Ustyurt Plateau being amongst the poorest regions of the country. Many large mammal species on the Ustyurt Plateau have been depleted through the 20th century including the now critically endangered saiga antelope.

Table 1: The comparative economic situations of three saiga range states (CIA 2011; UNDP 2010; World Bank 2011)

Indicators	Russia	Kazakhstan	Uzbekistan
Poverty incidence (%)	13.1% (2009)	8.2% (2009)	26% (2008 est.)
Life expectancy (men)	59.8	63.24	69.48
Life expectancy (women)	73.17	74.08	75.71
HDI rank worldwide (1st - 177th)	58th	64th	97th
GDP (PPP) per capita (US\$ per annum) (2010 estimates)	15,900	12,700	3,100
Literacy	99.4	99.5%	99.3%

Population size (million)	138,739,892	15,522,373	28,128,600
<1.25 US\$ per day (%)	0 in 2008 0.3 in 2002	<0.2 in 2007 3.1 in 2003	46.3 in 2003
<2 US\$ per day (%)	<0.1 in 2008 3.7 in 2002	<1.5 in 2007 17.2 in 2003	76.7 in 2003

Saiga antelope exploitation:

Saiga antelopes have historically been an important resource for people living within their traditional migration routes. The species has been hunted for its horns, meat and hide since prehistoric times (Bekenov *et al.* 1998; Lushchekina & Struchkov 2001). In Russia and Central Asia, hunting is an economically and culturally important activity. Bekenov *et al.* (1998) gives a summary of historic hunting activities and their influence on saiga populations. Saiga population sizes can also be influenced by extreme weather events, drought and disease. Despite strong reproductive potential (Kühl *et al.* 2007) saiga numbers have historically varied according to periods of intense hunting and subsequent conservation (Bekenov *et al.* 1998).



Hunters on motorcycles

Whilst the other populations of *S. t. tatarica* appear to have stabilised at low levels or started to increase the indications are that the Ustyurt population is continuing to decline (CMS 2010). Whilst naturally occurring causes of mortality continue to influence saiga numbers (Duissekeev, 2011) the principal cause of the dramatic reductions observed since the early 1990s remains unsustainable hunting (Lushchekina & Struchkov, 2001; Milner-Gulland *et al.*, 2001). *S. t. tatarica* are a popular target for hunters because of their relatively large size and herding behaviour during migrations and calving. These factors facilitate efficient hunting, which when combined with the saiga's valuable horns, make the species an attractive target for poachers.

Saiga horn is principally harvested for the Chinese traditional medicine market (Bekenov *et al.* 1998). Data from CITES shows that from 1995 to 2004, 67 tons of saiga derivatives,

representing approximately 280,000 saiga males, was traded (Li *et al.* 2007). These figures do not take into account the volume of saiga horn traded illegally. In areas where poverty and unemployment are common the profitability of hunting saiga for their valuable horns represents a necessary, if unpopular, lifestyle for many young men (Bekenov *et al.* 1998; Kühl *et al.* 2009). The impact of hunting for saiga horn has had a disproportionately large impact on saiga populations. Selective hunting for horn bearing males led to an imbalance in the population sex ratio causing reproductive collapse and impacted the ability of the species to recover from heavy poaching (Milner-Gulland *et al.* 2003).

Saiga antelopes are also hunted for their meat, which has traditionally been, and remains, cheaper than beef and other domestic meat in the Uzbek Ustyurt (pers obs.). In Kalmykia Kühl (2008) observed that saiga meat was referred to as “the meat of the poor” and eaten by those without the income to purchase meat from domestic animals; as a result eating saiga meat was considered a sign of poverty. With the collapse of centrally subsidised farming and increasing poverty as a result of the break up of the USSR it is likely that demand for saiga meat as a locally consumed protein source increased in the late 20th and early 21st centuries. Kühl (2008) demonstrated that a group of poachers in Bosoi (Kazakhstan) were deriving up to 80% of their poaching income through sales of meat. Rangers of the Chernye Zemli reserve (Russia) stated that demand for saiga meat increased at the beginning of the new millennium (2000: 10% meat demand, 90% horn demand; 2003: 50% meat demand, 50% horn demand), similar reports of an increasing demand for saiga meat were encountered numerous times during social surveys across the saiga range states (Kühl 2008).

Kühl *et al.* (2009) demonstrated that hunting for saiga was an unpopular livelihood activity because it was illegal, dangerous and had no opportunities for advancement; poaching was therefore primarily conducted by members of poor households who were unemployed. These findings were supported by reports from villagers living on the Ustyurt plateau and areas proximate to other saiga populations who reported that unemployment was the most significant driver of saiga poaching (75% of respondents), with the foreign demand for saiga horn rated as the most pertinent driver by 23% (Kühl *et al.* 2009). Local consumption of saiga meat was the most frequently mentioned secondary cause (25% of secondary responses; Kühl 2008).

Saiga conservation

Historically saiga numbers were able to recover during the 20th century due to the effectiveness of Soviet conservation strategies based on strict law enforcement combined with large protected areas and wilderness (Dinerstein *et al.* 1994). Since the collapse of the Soviet Union law enforcement has been less effective and struggled with



Conservation scientists visiting Jaslyk

harsh winter weather and large scales of the remote steppe habitat. Incidents of reported saiga poaching by rangers and policemen highlights the improvements required to law enforcement (Kühl 2008). Within the Uzbek Ustyurt the only protected area, the Saigachy Zakaznik, is currently operating without any supporting rangers and is poorly demarcated.

On the Ustyurt plateau, studies into the breeding biology and status of saiga antelope and research into the socio-economic drivers of saiga began in 2004. The Saiga Conservation Alliance was formally established in 2006 and has aimed to decrease human pressure on the Ustyurt population of saiga by improving public awareness of the issues surrounding saiga conservation, and to build a foundation of support for saigas and their conservation among local people, regional authorities including official nature conservation agencies, industrial companies and internationally. Within the Ustyurt region outreach measures have included locally based environmental educational programs for children, an alternative livelihood scheme aimed at women living on the Ustyurt and publications including books, posters, leaflets and the newsletter *Saiga News* which are distributed in local languages. Alongside outreach programs, monitoring of the Ustyurt saiga population and determining migratory patterns has been undertaken through satellite tracking, ground surveys and participatory monitoring. The SCA works alongside the state agencies responsible for Uzbekistan's national and regional nature conservation policy and in close cooperation with international and local conservation and development groups working on the Ustyurt plateau.

Community-based conservation initiatives in Uzbekistan

Environmental education

In the Uzbek Ustyurt an education program designed to raise child awareness of saiga antelope ecology and conservation has been implemented since 2006, in collaboration with local schools. Saiga Day and linked activities take place in three schools in two villages on the Uzbek Ustyurt, Jaslyk and Karakalpakia; a small-scale pilot initiative has also taken place in Kubla-na Ustyurt. Typically school children spend a few weeks undertaking preparatory activities including drawing, poem writing and essay competitions. Children then present what they have learned about the species at a “Saiga Day” which also includes plays, videos and talks about saiga antelope. In addition to school pupils, local business leaders and politicians attend Saiga Day; an increasing number of parents are also reported to be attending. In 2010, the leaders of one of the villages, Jaslyk, suggested that Saiga Day become a village-level event rather than being just for schools.



A child's drawing of saigas

Attitudes towards saigas

Past studies have suggested that adult villagers have positive attitudes towards saiga antelopes (Kühl *et al.* 2009) but that no association between attitudes and poaching behaviour was found. Howe *et al.* (in press) found in Russia that the positive attitudes she might not always have been as favourable to saigas, with 47% of interviewees reporting that their attitudes had changed from being either negative or indifferent towards saigas to positive during the period of a public awareness campaign. The attitude questions asked by Kühl *et al.* (2009) were limited and expanding the range of questions asked could improve understanding of attitudinal differences amongst adults living on the Ustyurt plateau.

Alternative livelihood scheme

Poverty, unemployment and limited employment opportunities have been identified as key drivers of illegal saiga poaching (Milner-Gulland *et al.* 2001; Robinson & Milner-Gulland

2003; CMS 2006, 2010; Kühl *et al.* 2009). Employment opportunities on the Ustyurt plateau are largely limited to work related to natural gas extraction and transportation or the railway line that connects Uzbekistan to Kazakhstan. As well as making the financial gains from saiga hunting attractive to comparatively poor individuals, a lack of employment opportunities may be a factor which is encouraging local dependence on comparatively cheap saiga meat. Kühl (2008) concluded, “Ultimately, until the socio-economic forces driving saiga exploitation are addressed, saiga poaching is likely to continue”.

In an effort to provide an alternative livelihood opportunity that would address rural poverty the Saiga Conservation Alliance has supported the development of two centres that teach traditional embroidery techniques to women in the villages of Jaslyk and Karakalpakia and provide a business structure through which their products can be sold. The embroidery scheme was envisaged as having a twofold benefit for the conservation of saiga antelope (Figure 2). Firstly a group of women regularly attending an embroidery centre would circumvent many logistical difficulties associated with providing environmental education for adults, enabling the direct promotion of the saiga conservation agenda to those who make household decisions. A reduction in the quantity of saiga meat consumed was an expressed goal. Women control household budgets in the area and it was hypothesised that as a result of increasingly eco-centric attitudes and an additional income source women would neither want to buy saiga meat, nor be required to do so by financial restraints. A secondary benefit was predicted to be that women who were involved in the scheme would discourage their husbands and male relatives from involvement with saiga poaching.

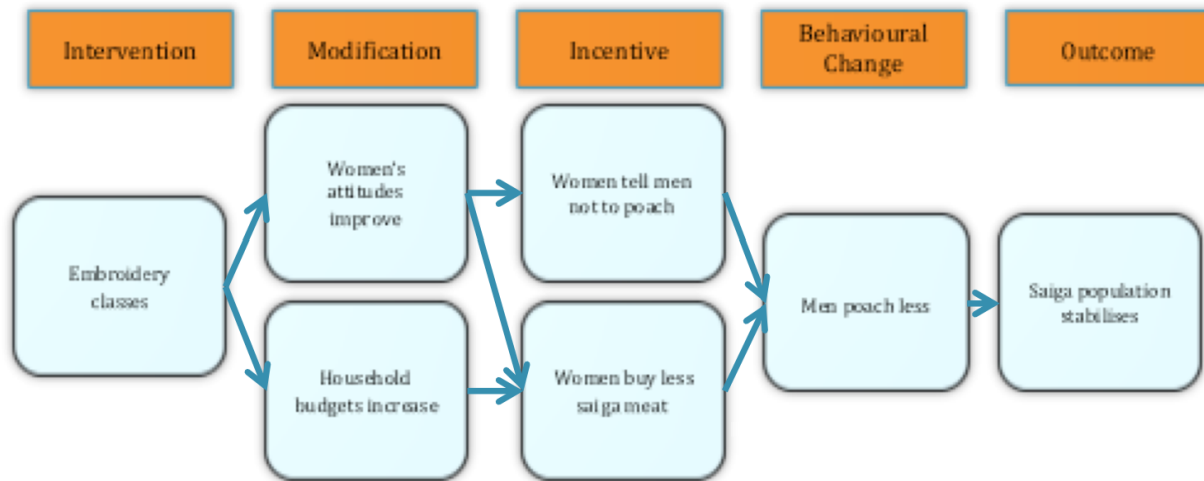


Figure 2: Hypothesised causal links for the alternative livelihood engagement strategy

The embroidery based alternative livelihoods program was piloted in Jaslyk in 2009, with the Karakalpakia centre opening on a smaller scale shortly afterwards. The village-based centres gain the skills needed to teach embroidery techniques and manage their groups from a central embroidery school run by the local NGO 'Ornament' in the district capital of Nukus. Aizada Nurumbetova established this regional embroidery centre in order to teach traditional Karakalpak and Kazakh embroidery patterns and provide business experience to women from disadvantaged backgrounds and those who had been the victims of domestic abuse. With the help of grants from SCA, The Wilds and the Wildlife Conservation Network (WCN) the existing program was expanded onto the Ustyurt plateau with the goal of conserving saiga antelopes.

Concerns about the effectiveness of alternative livelihood schemes are particularly relevant to this embroidery scheme as it does not directly target those responsible for harvesting the resource but instead relies on the receptiveness of men to the increased financial resources and changed attitudes of wives and female relatives (Figure 2).

Methodology

Study area

Three villages were surveyed; Jaslyk and Karakalpaka, where both environmental education and alternative livelihood interventions have been implemented, and Kubla-na Ustyurt, which acted as a counterfactual community (Figure 1); all settlements in this region are located along infrastructure, either the railway, gas pipeline and road that run parallel across the area from southeast to northwest and connect Kungrad (Uzbekistan) to Beyneu (Kazakhstan) or along the currently disused Bukhara-Yekaterinburg gas pipeline that runs south-north along the western shore of the Aral Sea and passes Bosoi further to the north.



The Ustyurt plateau

Data collection

Data collection using semi-structured interviews took place in households, schools and at embroidery centres in the three study villages during June and July 2011. Three population sub samples (children, adults and participants in the embroidery program) were interviewed using an informal questionnaire survey instrument (Bernard 2006) that was administered by the investigator via a local translator. Questions were administered in the Karakalpak, Russian or Uzbek



Conducting household interviews

language depending on the respondents' preference. An English language copy of the survey questionnaire is reproduced in Appendix 1. The adult portion of the questionnaire included eight attitudinal questions presented as a series of scenarios with answers on a Likert scale from "strongly agree" to "strongly disagree". Attitudinal questions were based

on those used in previous investigations into attitudes towards animals (Kellert 1985; Prokop & Tunnicliffe 2008, Damerell & Hernandez, in prep.). The focus of the questions was changed to saiga antelopes and the wording modified to be suitable to the local scenario. Attitude questions were formulated either negatively or positively and scored from -2, strongly negative towards saiga, to +2 for highly positive responses. Summing responses to the eight attitudinal questions formed individual attitude scores. Adults were asked three additional questions in the same Likert style to identify their perceptions of local social norms towards saiga antelopes and their exploitation. A mixture of closed and open questions was used to investigate adult awareness of and involvement with both Saiga Day and the embroidery scheme. A fourth set of questions asked respondents about household and village behaviour related to saiga exploitation. Adult questionnaires took between 10 minutes and 45 minutes to complete.

School students were asked four questions about saiga ecology and conservation in order to generate a knowledge measure. Correct responses to these questions were scored +1 and the summed total used to represent student knowledge. One of the knowledge questions; "What are the saiga's biggest problems (name 3), please put these problems in order of importance" was also used to investigate whether children were aware that humans were a threat to saiga, and whether they recognised that anthropogenic causes were the most important factor driving *S. t. tatarica* declines. Children were additionally asked about their attendance at Saiga Day and opinions of the educational activities they had been involved with. Questionnaires took students 5-15 minutes to complete.

Those involved in the embroidery schemes were asked about their attendance, reason for involvement and their perceptions of the embroidery scheme. Interviews with embroiderers included an unstructured section where participants were encouraged to expand on any aspect of their involvement in the scheme. Interviews with embroiderers took less than 30 minutes. Demographic information from the three interest groups was also collected.

Semi-structured interviews were held with key informants in order to develop a clearer understanding of how the interventions under study were being operated. Head teachers and those teachers most responsible for organising environmental education activities were interviewed at the three schools. The head of each embroidery centre was interviewed along with the founder of the embroidery centre in Nukus. Local authorities including the Village Head and representatives from the police force were also questioned.

A pilot study to assess the questionnaires' suitability was carried out in Jaslyk. Eleven questions were removed after they were deemed to be of limited interest and the survey was found to be overly long and complex. A methodological change was also implemented. Köhl (2008) reported that villagers found poaching activity sensitive to discuss. As a result this study had intended to use a randomised response technique for the adult behavioural questions in order to improve accuracy (St. John *et al.* 2011). A forced response technique was trialled but found to be overly complex, poorly understood and mistrusted by respondents. As a result the remaining respondents were asked directly about their knowledge of saiga exploitation and consumption.

Data analysis

Univariate statistical analysis was used to test for associations between attitude and knowledge scores and potential explanatory variables. Additionally multivariate analysis was used to investigate which explanatory variables were significant predictors of the observed attitude and knowledge scores, but the models produced were rejected after analysis of diagnostic plots. Anecdotal evidence recorded during the interview process was used to support significant associations found during the univariate analysis.



Jaslyk

Determining the suitability and success of an alternative livelihood scheme requires the analysis of a wide range of project components. Salafsky (2001) produced a framework for the analysis of community based livelihood schemes. We used a simplified version of this framework to separate the programme into its constituent components and assess the successes and failings of each according to standards for projects with good and bad prospects for success.

Statistical analysis was carried out using R for Mac OS X GUI 1.40 (R Development Core Team, 2011).

Results

School based education

Key informant interviews

Prior to the involvement of the conservationists in the area it was almost impossible for local teaching staff to find information or resources on saiga antelopes and environmental themes more generally. Saiga Day and its associated activities were reported to have become an ingrained feature of the school calendar with the school director in Jaslyk (school number 54) reporting that approximately 300 pupils took part this year and up to 100 parents had been involved either through attending Saiga Day or assisting with an excursion onto the plateau that the school organised.



Child participants

Similar figures were reported from Karakalpakia where teachers at school number 56 reported 250 children and 100-150 adults attending Saiga Day whilst the whole intake of school number 26 in Karakalpakia (295 pupils) and between 30 and 40 parents attended. The two larger schools, 54 and 56, both reported parent attendances of over 100 at their most recent Saiga Day. The Village Heads from both villages attended Saiga Day in their village, along with representatives from the major employers in the area, police force and, in Karakalpakia, representatives of the customs authority. It was the opinion of teachers and the Head in both villages that the education program was achieving its aims of raising awareness of saiga and that children were “...getting closer to nature”. One teacher reported that “*Because the parents are more involved this year the message has spread to them too*”.

Children's Knowledge scores

54 children completed the questionnaire. Generated knowledge scores were normally distributed around a mean of 3.83; the lowest score recorded was 0 and the highest 8 from a maximum score of 10. In addition to giving a distribution of knowledge scores for use in statistical analysis, the way in which children answered the knowledge questions also gives insights into the educational process. When asked “Where do saiga live?” 9 respondents mentioned Karakalpakstan and two respondents mentioned Karakalpakstan and/or the

Ustyurt plateau but not Uzbekistan. When children were asked to tell the investigator an interesting fact about saiga antelopes, 21 of the 54 students were confident enough in their saiga knowledge to volunteer information. The majority of facts (16) were about saiga ecology; especially what habitats they lived in, their speed and the fact they were migratory. Three students gave facts about saiga conservation ("*they're in the Red Book*" was mentioned twice and "*There has been a 95% reduction in the number of saigas*").

A relationship was found between attending Saiga Day and child knowledge (Figure 3a). The scores of non-participants were significantly lower than the scores of those involved in educational activities (one-way t-test; $t = -2.2761$, $df = 27.291$, $p = 0.016$). No significant difference in knowledge scores was seen between villages, although knowledge was lower on average in Kubla-na-Ustyurt (Figure 3b; analysis of variance $F_{2,51} = 2.131$; $p = 0.129$).

When a child participated in educational activities explains a highly significant amount of the variation between observed knowledge scores (analysis of variance; $F_{3,50} = 4.0639$; $p = 0.012$; Figure 4). Students who attended 'this year and previously' had significantly higher knowledge scores than students who had never attended (Tukeys honest significant difference *post-hoc comparison of means*; $diff = 1.889$, $p = 0.008$).

No children described the educational activities they were involved with as boring or said that they did not like them. Educational activities were always described as "fun" or "fun and I learnt new things about saiga". The majority mentioned that Saiga Day had been educational as well as fun, with only 9 out of 36 attendees saying it was just "fun". Those who felt that Saiga Day was educational had significantly higher knowledge scores than those who just found it fun (one-way t test; $t = -2.1097$, $df = 15.199$, $p\text{-value} = 0.026$).

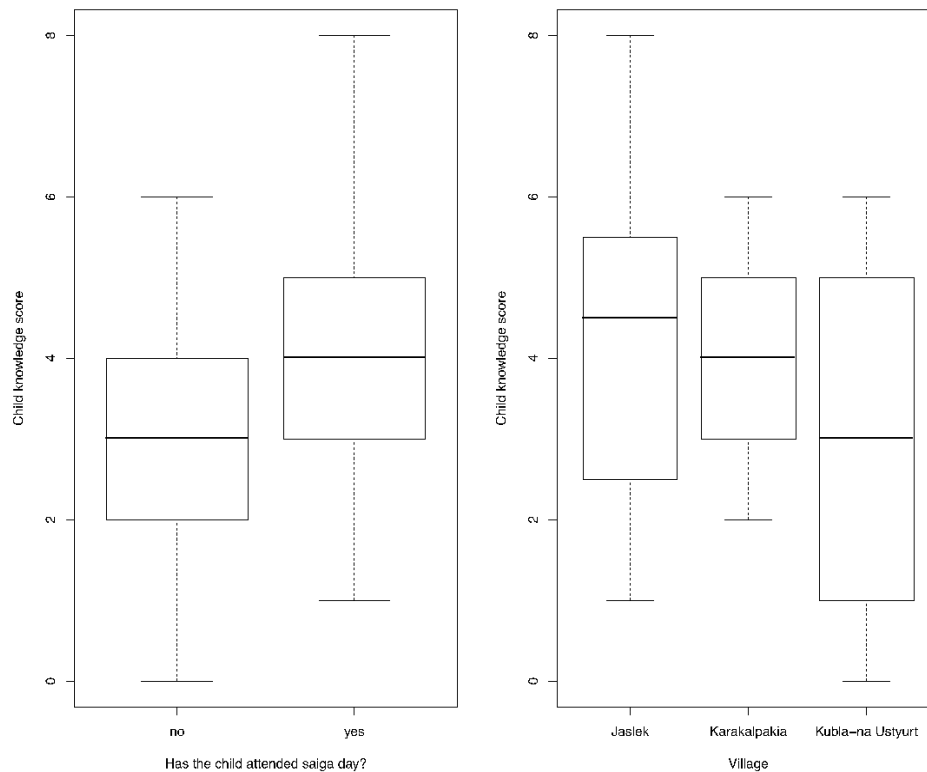


Figure 3: The distribution of child knowledge scores according to **a**: their attendance of Saiga Day activities and **b**: the village in which they live.

Older students had significantly higher knowledge scores ($t = 2.550$, $df = 52$, $p\text{-value} = 0.014$), though whilst the correlation observed was significant it was not strong ($cor = 0.333$). Age was the only demographic variable to have a significant association with observed knowledge scores, however it does appear confounded with when the child attended educational activities and the village from which they were sampled. As such the direct causative drivers of increased child knowledge are hard to separate in this analysis.

Recognising humans as a driver of saiga extinction

The majority of children (66%) included an anthropogenic activity amongst their perception of the three main threats to saiga. Native predators were the most regularly stated natural threat to saiga, with wolves being the most frequently mentioned. Four children couldn't name any threats to saiga antelopes. No significant difference was seen between students who had and had not taken part in educational activities in the proportion of those who mentioned an anthropogenic activity amongst the threats to saigas

(Chi squared = 1.151, df = 1, p = 0.283). 75% of children who had taken part in educational activities and 50% of those who had not taken part in educational activities did recognise that human activities were a threat to saiga. Similarly children who had taken part in educational activities did not name “Anthropogenic factors” as the most significant threat to saiga populations more frequently than those who had not attended these activities (Chi squared = 0.821, df = 1, p = 0.365).

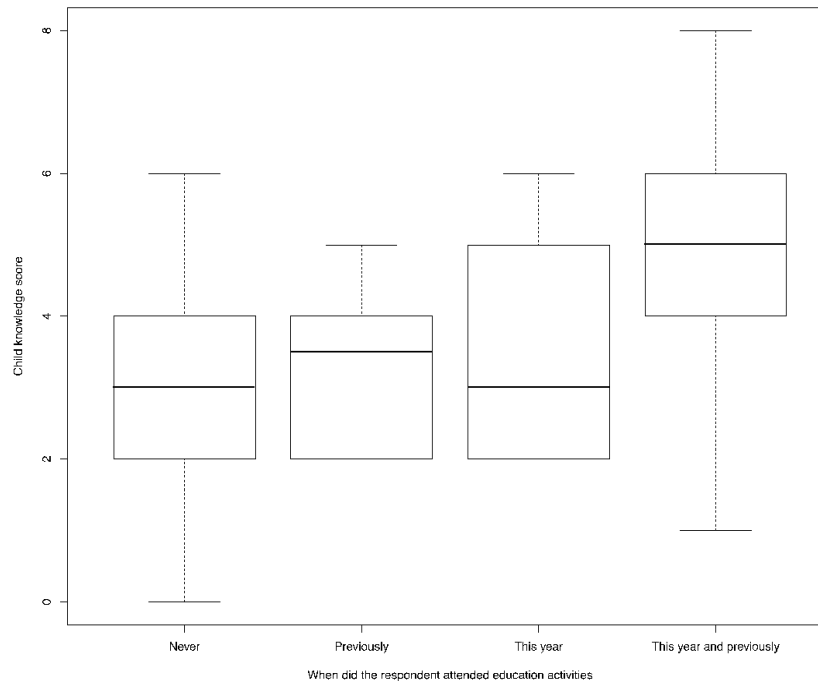


Figure 4: Variation in children’s knowledge scores according to when education activities were attended

Over half of respondents from Jaslyk and Karakalpokia stated that anthropogenic activities were the most important threat to saiga antelope; 70% of the respondents from Kubla-na Ustyurt thought natural causes were the most influential factor (Figure 5). Response rates for each threat category are significantly different between villages (Fisher's Exact Test for Count Data, p=0.016).

Again a significant effect on the distribution of observed results is seen with child age. Children who mentioned human activities as a threat to saiga had significantly higher ages than those who did not (t = 4.560, df = 31.74, p-value = <0.0001). As with the analysis of children’s saiga knowledge scores, the confounded nature of the variables age, village and

when the child attended saiga education activities makes drawing conclusions about the influence of individual variables hard to discern.

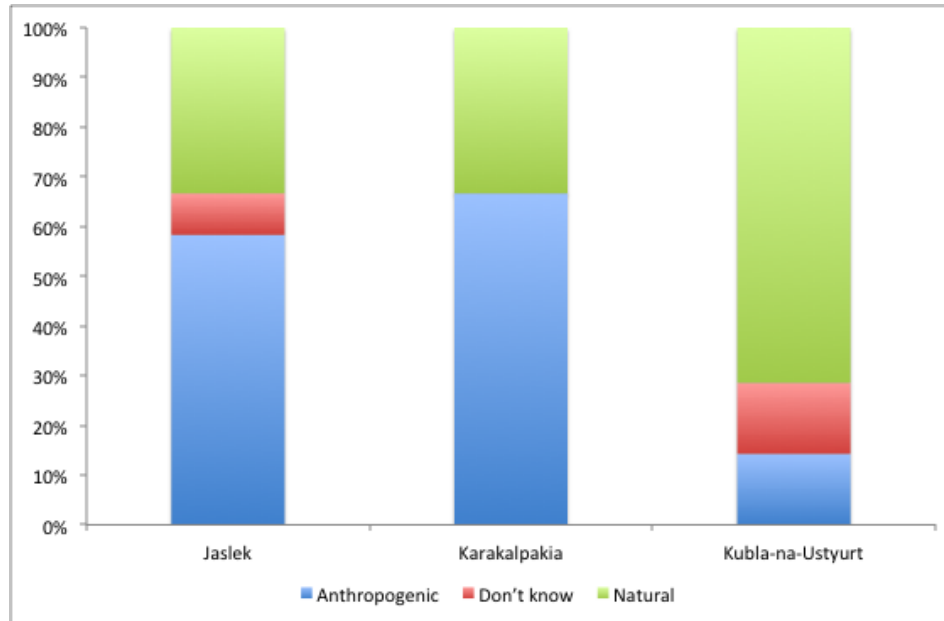


Figure 5: Child reporting of the most important threat to saiga antelope by village

Students who reported that they learnt new things about saigas from the educational activities came close to mentioning anthropogenic activities more regularly than those who just found the activities fun (Fisher's Exact Test for Count Data $p = 0.079$). Those who stated that they learned new information from the educational activities did report human activities as the largest threat significantly more regularly (Fisher's Exact Test for Count Data $p = 0.033$; Figure 6).

Additional findings from the child questionnaire

All pupils who attended Saiga Day reported that they had wanted to and that it was not aimed at a single age group but suitable for “everyone”. 86% of respondents said they had discussed the educational activities with their family. 9 students reported passing on information with a direct conservation message and some children took home items they had made during the build up for Saiga Day or a book on saigas they had been given.

When children were asked to describe their favourite part of the educational activities the majority mentioned the visual learning aspects of Saiga Day including the play and video

they were shown. Creative activities such as embroidery, drawing and poem writing were the most popular for 15 respondents. Only 9 respondents mentioned something they didn't like; 5 of those said they didn't like seeing the saiga shot on the video and the remaining pupils commented on the logistics of the event.

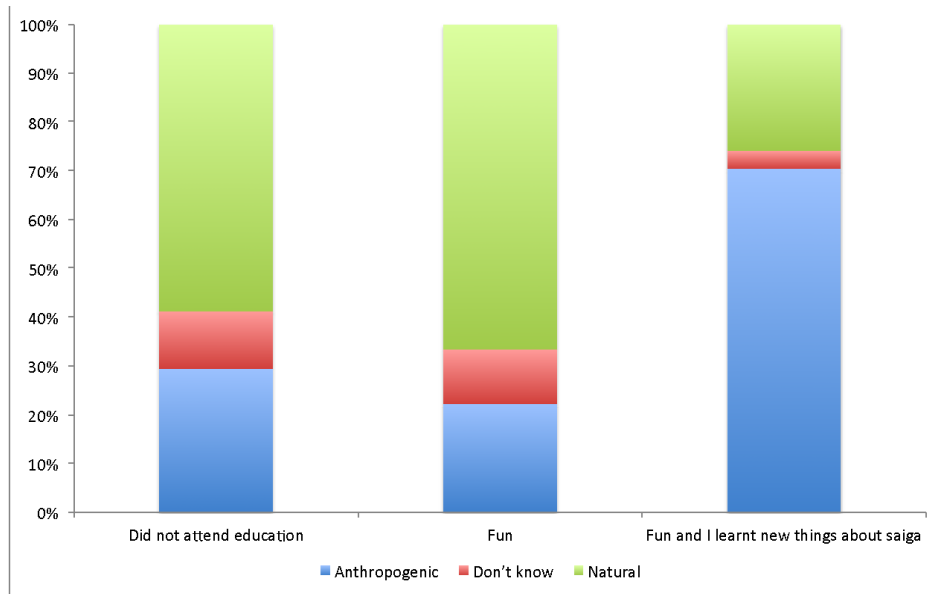


Figure 6: Child perception of the largest threat to saiga antelope according to their perception of environmental education activities

When children were asked what they would do to improve Saiga Day the answers fell into 4 categories. "I would do more of the same" and "I would keep the format the same but make the event bigger and have a wider variety of events and competitions" encompass most of the responses. Three children wanted to make the saiga conservation campaign more visible to the wider community and the remaining students either wanted live saigas brought to the school or to have excursions to see saigas.

Pupils were not certain about who was responsible for running the education activities and Saiga Day event. 19 respondents stated that they did not know, 11 said it was their teachers, 7 felt it was being run by people from outside their community. Only one child mentioned the Saiga Conservation Alliance.

Adult attitudes towards saigas

In general adult respondents held positive attitudes towards saigas. For the statement “Protecting the saiga is a low priority” all respondents either disagreed or strongly disagreed (65% strongly disagreed). 88% of adults strongly agreed saiga extinction would be a very bad thing; the remaining respondents agreed that it would be bad. All respondents disagreed that “Teaching children about saigas is a waste of time” (70% strongly disagreed). Responses for the statement “I would like to learn more about the saiga” were more varied; 3 people qualified their answer by saying “we already knew a lot about saigas” but there was a strong desire to learn more about how scientists are working to protect them. Respondents were keener still to watch a television programme about saigas. 70% of respondents strongly agreeing that this would be something they would like to see. When asked whether an increase in saiga numbers would be a good thing, all respondents answers were positive but a wider range of responses was seen than for the other attitude questions; two respondents gave interesting elaborations; “I agree, more saiga means more profit and more benefit” and “I agree. It would be lovely to have saiga back but people would just kill them all over again.”



Adult respondents and their family

The consumption of saiga meat was viewed in a very different way to poaching for saiga horn within the sampled villages. Hunting for saiga horn was widely recognised amongst the adult community as a principal cause for the species decline and as a result referred to negatively (pers. obs). The same respondents who spoke negatively about hunting for saiga horn frequently stated that eating saiga meat was not considered “a bad thing to do” by the community and that they would not describe it as “a bad thing to do” either.

Attitude scores were distributed normally around a mean of 10.49 and are all within the positive portion of the maximum theoretical range (-16 to +16; Figure 7). None of the socio-demographic variables for which data was collected was significantly related to the distribution of adult attitudes scores. Additionally no significant difference in saiga attitude scores was observed for adults who had and had not attended Saiga Day (t test $t = 1.026$, $df = 12.38$, $p = 0.325$).

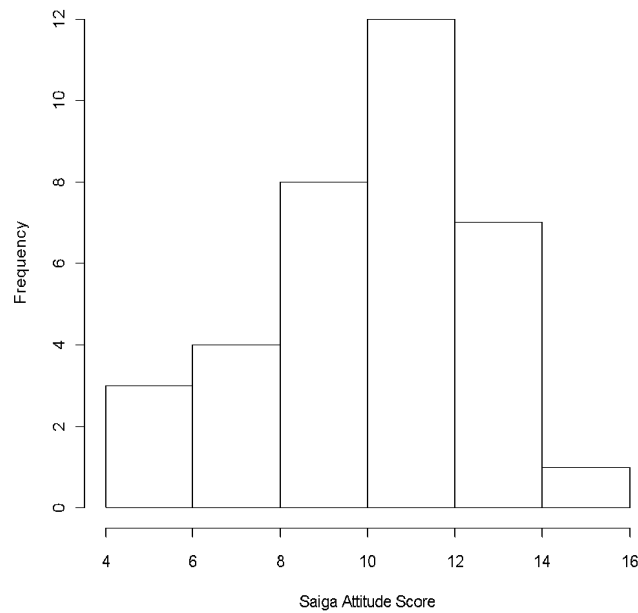


Figure 7: The distribution of adult attitude scores, where scores could theoretically range between -16 (very negative) to +16.

Interesting contrasts were observed in the responses to social norm questions by attendees and non-attendees of Saiga Day. When asked how much they agreed with the statement “I feel the same way about the importance of protecting saiga as other people in my village” no difference was observed between the two sub samples (Fisher's Exact Test for Count Data $p = 1$). When adults had not been to Saiga Day almost 50% agreed that “adults in my community believe saiga hunting is acceptable” this percentage drops to zero amongst attendees of Saiga Day (Figure 8a; Fisher's Exact Test for Count Data $p = 0.030$). A similar pattern is seen for the proportions of individuals who agreed with the statement “people in my village believe eating saiga meat is a bad thing to do”. A significantly larger proportion of those who had attended Saiga Day report an eco-centric social norm than those who had not attended (Figure 8b; Fisher's Exact Test for Count Data $p = 0.006$).

The existence of Saiga Day was reportedly well known yet it was poorly attended by adult respondents from both Jaslyk and Karakalpakia, with just 9 of the 35 respondents attending. All of those who attended reported that Saiga Day was targeted at all members of the community and that they learned something new about saigas. None of the six respondents who elaborated on what they had learned mentioned activities that were being undertaken to conserve saigas, however respondents did state that attending Saiga Day had made them feel more strongly about the importance of protecting saigas. 18

respondents said that they would like to attend Saiga Day next year; one more than had said in an earlier question that they were aware of Saiga Day. Several respondents qualified their expressed desire to attend Saiga Day by saying that they would be unable to do so if it took place during the day as they worked then or that the event would have to be well publicised in advance. Five respondents recognised that Saiga Day was co-ordinated by Elena Bykova and Alexander Esipov or the SCA; six said that they did not know who was responsible for co-ordinating the event; three said that the school was responsible and three felt people from foreign countries managed it.

Only two of the adult respondents interviewed admitted eating meat, one respondent from Kubla-na Ustyurt and a second from Karakalpakia. The respondent from Kubla-na Ustyurt was clearly uncomfortable about giving away much information concerning saiga meat consumption in general; *“I only ate it only once this year, whilst visiting Jaslyk”*. The second respondent was very open about her meat consumption; *“yes I bought saiga meat all winter until the summer. It costs up to 8000 Som per kilo, that’s the most expensive it is, and it’s outstanding, better than beef. I bought it undercover from friends”*.

People were relaxed about answering whether or not they had seen saigas. Many said it had been between 5 or 8 years since they had seen any saiga antelopes. The four people who recalled seeing saigas this year stated that it had been at some distance and in areas at least 80km from human habitation. Eight people, almost a quarter of respondents, stated that saiga hunting had been undertaken by residents of their village in the past 12 months. No one from Kubla-na Ustyurt said hunting had happened there within the past 8 years. No respondents stated that a member of their family had hunted saigas in the past year.

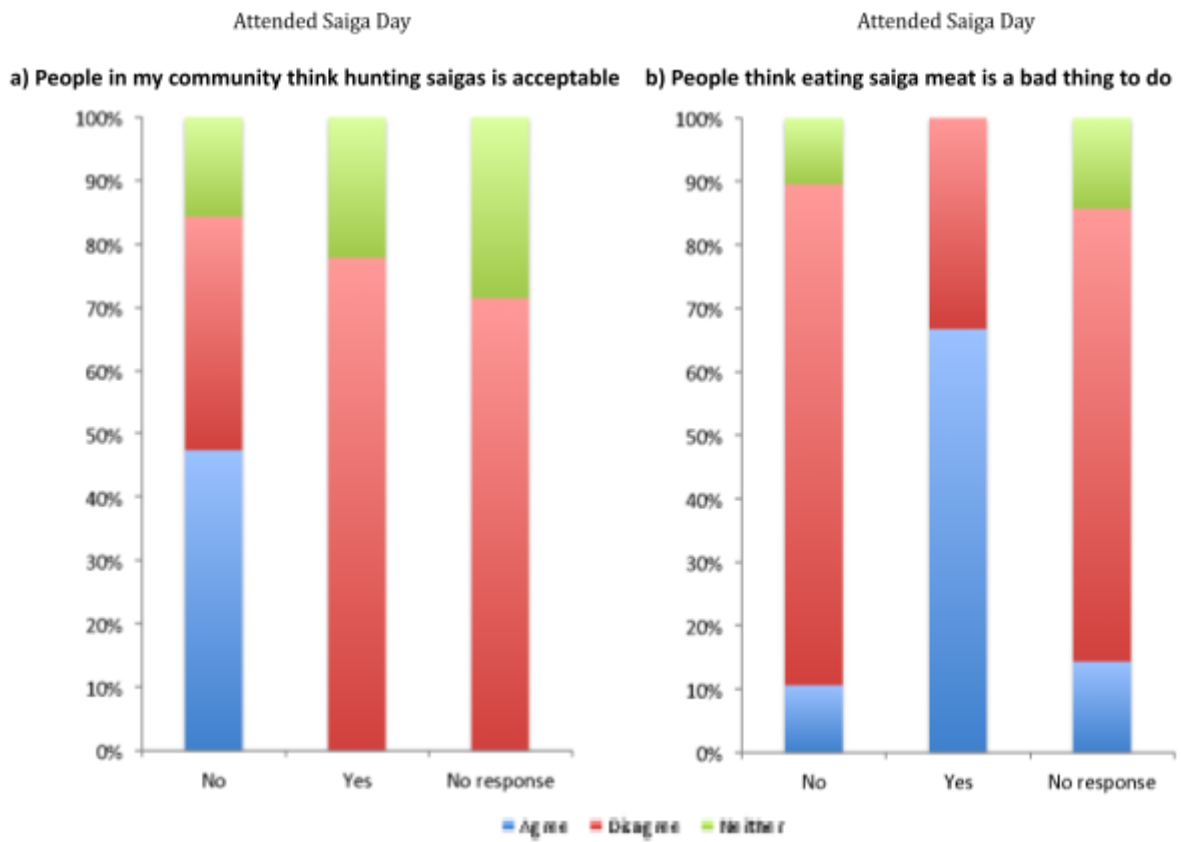


Figure 8: Differing proportions of adults who agree with statements about community social norms towards illegal saiga exploitation

Alternative livelihoods program

13 embroiders, 10 from Jaslyk and 3 from Karakalpakia, and 10 adult relatives of women involved in the embroidery scheme were interviewed. Embroiderers ranged in age from 11 to 40 with an average age of 20.2 years. Figure 9 shows the responses of embroiderers and their adult relatives to the question “what is the main purpose of the embroidery scheme”. This was asked as a closed question and included the answer “It provides additional income for a family”; no respondents selected this answer.



Members of the Jaslyk embroidery group

A framework for assessing the suitability of community based conservation initiatives made an excellent structure on which to base this initial assessment of the embroidery schemes effectiveness (Table 2). Whilst some areas of the program clearly need to be addressed there are many positive messages to be taken away from the current situation.

Table 2: The ability of the embroidery alternative livelihoods scheme to meet criteria indicative of a successful community based conservation scheme. The areas of the intervention that require attention are indicated by bold text. Adapted and simplified from Salafsky *et al.* (2001)

Factor	Good Prospects	Bad Prospects	Embroidery program
<i>Enterprise</i>			
Profitability	More than covers costs	Does not cover costs	Does not cover costs
Market demand	Moderate	Too high or too low	Too low

The Impact of Community Conservation Initiatives in the Uzbek Ustyurt

Infrastructure	Good	Poor	OK and Improving
Local skills	High	Low	High
Complexity	Low	High	Low
Linkage to conservation	High	Low (or not perceived)	<i>Not perceived</i>
<i>Benefits</i>			
Cash benefits	Moderate	Too high or too low	<i>Too low</i>
Non cash benefits	High	Limited	High
Time benefits received	Immediately	Long or uncertain wait	Short wait
Distribution	Targets those conserving	Too broad / wrong people	<i>Not reaching women with household influence</i>
<i>Stakeholders</i>			
Leadership	Balanced & respected	Absent or too strong	Balanced & respected
Homogeneity of group	Complete	Limited	Strong
Conflict	Absent	Present	Absent
<i>Other</i>			
Chaotic situation	Unlikely	Endemic	Unlikely
Project alliance	Experienced & Established	Otherwise	Established

Enterprise

At the moment the embroidery scheme is still relying on grants from the SCA to cover its costs. Profitability could be increased through improved market demand. Currently the

items produced are sold through the embroidery centre in Nukus and at an embroidery shop in Tashkent. Additionally the SCA sells some items at the Wildlife Conservation Network Expo and the embroidery group in Karakalpakia reported selling a few of the first items they produced on the train between Tadjikistan and Kazakhstan. The women involved in the embroidery program produce various high quality items (Figure 10) and it is clear that more profitable markets are available.

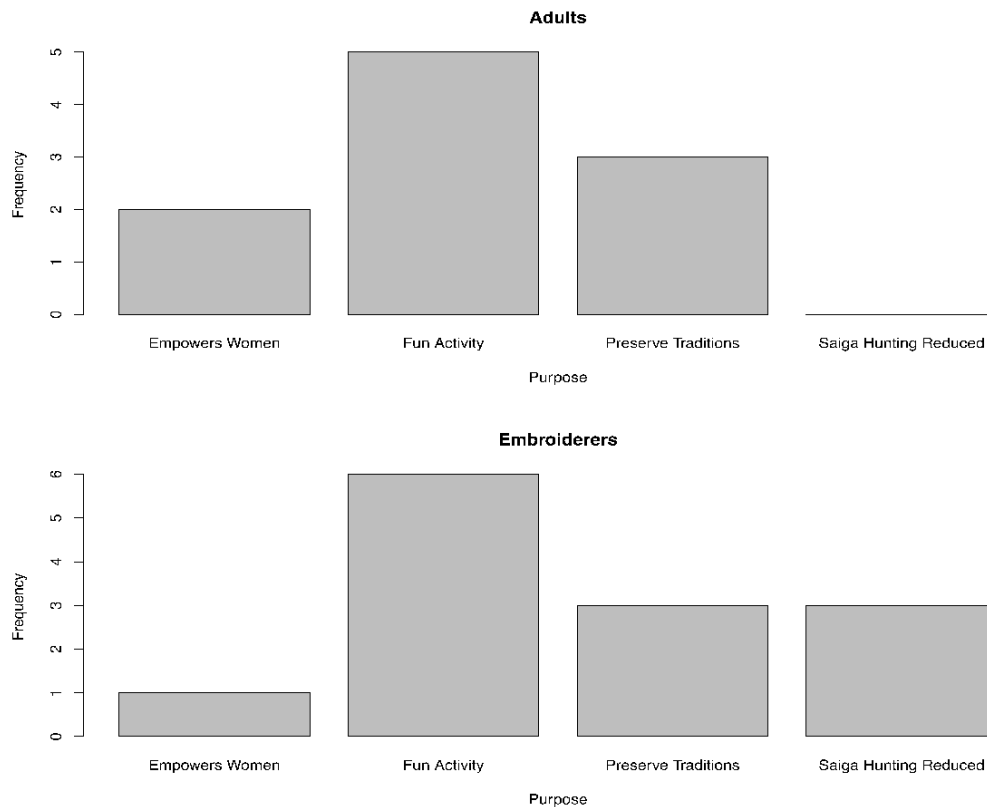


Figure 9: Frequency of responses to the question “what is the main purpose of the embroidery scheme” for embroiderers and their adult relatives.

Infrastructure: The embroidery scheme has relatively small start-up and running costs. The Jaslyk group uses a classroom in the village school whilst the Karakalpakia centre has just been relocated to a larger room and ordered more sewing machines (on credit). This new room is in need of decorating and having a new heating system installed before winter. Once up and running the room will be able to accommodate around 20 embroiderers.

Local skills: This is another area where the scheme scores well. The activity is highly culturally suitable. Embroidery is a popular activity amongst Uzbek women of all ages (pers. obs.)

Complexity: The embroidery program has low levels of complexity, being dependent on readily available materials. The main complexities will arise from transporting the products to a suitable market when it has been identified.

Linkage to conservation: Few of the embroiders who were interviewed identified a reduction in the poaching of saiga as the principal purpose of the scheme and none of their adult relatives highlighted this as the major reason for the scheme's existence (Figure 9). Whilst interviewing Aizada, the project leader, in Nukus it was clear that the emphasis of this regional centre was on traditional culture and local identity and it was difficult to determine where the integration of the saiga conservation goals was taking place. The embroiderers in Jaslyk reported that they had seen a video on saiga conservation and Saliya Slykova, the leader of the Karakalpakia centre, reported talking to her group about saiga conservation.



Figure 10: embroidery products made by the Jaslyk group

Benefits:

Cash benefits: As a result of the limited local markets currently being accessed by the scheme the financial income the embroiderers are receiving is limited. Aizada believed the

embroidery program is currently having a medium impact at the household level, contributing up to 50% of family income. Later interviews with the group members show that this was a highly optimistic figure for the groups on the Ustyurt plateau. On average each woman involved in the embroidery program was earning between 10,000 and 20,000 Som (~\$6-\$12) per month depending on how much time they were able to commit to the group. Aynash Khalmamaeva, the leader of the Jaslyk centre, reported earning around 100,000 Som (\$60) a month through the embroidery. As Aynash says, *"It is not a big amount of money that the girls make, just a little extra cash."* Three main embroidery items are currently being produced. All require a large time investment for the financial return.

- Mobile phone covers earn the women 2000 Som (~\$1) and take 1-2 days to make
- Wallets also take 1-2 days and bring in 5000 Som (~\$2.5)
- Larger style "shopping bags" take up to 10 days and sell for 10,000 Som (~\$6)

The participants clearly enjoyed attending the embroidery group but viewed it as a hobby rather than a potential livelihood. The husband of one embroiderer said *"my wife has been doing embroidery with Aynash for more than three months.... selling embroidery brings in a little extra money. Aynash makes lots of money, but my wife only brings in a little extra money. The embroiderers don't get much money but it's a good fun activity for girls."* The embroiderers themselves said *"It [The most important purpose] is A (preserve traditions), definitely not D (Provides additional income for a family). B (fun activity for girls) and E (It empowers women) are also important"*. A second member of the embroidery group stated *"I don't know which purpose to chose, D (Provides additional income for a family) is definitely the worst, it doesn't bring in any income."*

The amounts of money currently being earned by the women who are involved in the scheme are insufficient to enable them to switch from buying saiga meat to beef. Saiga meat reportedly costs between 4,000 and 8,000 Som (~\$2-\$4) per kilo whilst a kilo of beef sells for 11,000-12,000 Som (~\$5.5-\$6; multiple local sources pers. comm.). A small number of families were asked about their meat consumption and a family of 4 was reported as eating an average of 12 kilos of meat per month. If a family of four ate the cheapest cuts of saiga meat and wanted to change their eating habits to eating the cheapest beef available, it would cost them an extra 84,000 Som (~\$42) per month during the winter season when saiga are present in the Uzbek Ustyurt. If, as a result of education at the embroidery groups, a family of four chose to switch from eating the best saiga meat available to the cheapest beef it would cost an extra 36,000 Som (~\$18) per month. The mean family size of all the

adults interviewed for this study was 5.5, and the mean additional income from embroidery around \$10 per month.

Non-cash benefits: Participants were extremely positive about the embroidery group, were happy to be involved and saw it as a fun activity.

Time benefits received: The time taken for cash benefits to be received is currently not an issue of significance because of the small amounts of money being generated.

Distribution: The majority of the embroiderers are under 18 and still at school and the average age for the sampled participants was 20. Former embroiderers mentioned that their principal reason for leaving the scheme was a lack of time as a result of marriage. Some hoped they might be able to re-join once their children had grown up.

A second issue with the current demography of those involved relates to the lack of individuals from poorer households, which are more likely to be associated with saiga poaching and responsive to alternative income generation. The small sample size of this study means firm conclusions about the socio-demographic make up of the embroidery groups cannot be drawn. However, at the moment the Jaslyk group appears to be attracting residents by word of mouth and all of those interviewed were from, seemingly, comparatively wealthy households; people from these households are less likely to be dependent on saiga meat and poaching. In Karakalpakia a poster campaign had been used to alert potential members of the scheme's re-launch and a more diverse group had been assembled with at least one middle aged woman (who was in a position to dictate household spending), a girl from the poorer Kazakh Aul (district) and two girls whose families lived in Bostan, an isolated railway station suspected to have a number of poaching households (Figure 1).

Stakeholders:

Leadership: Aizada, the leader of the embroidery centre in Nukus that oversees the embroidery scheme, is passionate and driven; she also has a strong personal interest in saiga conservation. Leadership within the villages of Jaslyk and Karakalpakia has experienced recent changes. Aynash, the leader of the Jaslyk centre, has a strong relationship with those involved in her group and is keen to increase the number of orders they receive, see the scheme grow into a viable business and make managing the group a viable career. Saliya, the manager of the Karakalpakia group, does not have such long-term

goals, stating that *“I have a short time until I retire and I just wanted to teach some skills”*. Until that time Saliya is certainly dedicated to the program: *“If there is a big crowd I can do 2 lessons a week with 20 pupils at each lesson. I’m open 5 days a week”*.

Homogeneity of group: those currently involved in the embroidery scheme form a harmonious group who enjoy attending the embroidery centres as much for the social aspects of being engaged in the programme as for the skills acquisition (pers. obs.).

Conflict: No internal conflicts were observed between current group members at the participant or management levels. Similarly no conflicts were observed with external parties. When I explained the role of the embroidery scheme to people working on the Ustyurt a few were sceptical about its ability to conserve saiga *“men are not interested in embroidery, only girls, you have to get jobs for young men”*, but the majority were glad to see external organisations taking an interest in the area and helping to instigate a meaningful project. Aizada reported that the entire embroidery tuition scheme (not just the saiga-focused portion on the Ustyurt) has positive political backing as it fits within local development objectives being laid out by government.

Other:

Chaotic situations: Natural disasters and political turmoil are unlikely to threaten the scheme.

Project alliance: The alliance between the Nukus-based embroidery centre and scientists focused on saiga conservation has grown into a long-term association. Whilst recent changes at the local level have taken place there is no reason to assume that strong and lasting relationships cannot be developed which will benefit all of those involved in the program. A third embroidery group is soon to be established in Akchalak (also known as Kyr-kyz).

Discussion

Sampling methodology

Sample sizes were small for all sub-samples (embroiderers, adults and school children); this was partly due to the time of year in which the study took place. Summer temperatures in the Ustyurt can be very high and it was observed that a large number of people in the communities under investigation had left their villages in order to visit relatives in Kazakhstan or the cities of Kungrad or Nukus in Uzbekistan. Many school children were away on school summer camps in the region of Tashkent. This absence of target respondents was particularly noticeable for the embroidery respondents, of whom only 13 out of an expected 50-60 were available for interview. High summer temperatures also made it difficult to interview respondents in the afternoon when many adults and children were sleeping through the heat of the day. We would recommend that, where possible, future socially orientated studies take place a month or two earlier in the year.



Jaslyk

Further sampling difficulties were experienced with the randomised response technique. Following successful implementation of the forced response technique during investigations into illegal persecution of carnivores in South Africa (St John *et al.* 2011) it was felt that this technique could allow a greater insight into illegal behaviours than direct questions. The forced response technique was abandoned after the pilot study, where it was found that respondents mistrusted the methodology and as a result would manipulate their actions to ensure that they avoided having to answer honestly. Careful explanation of respondent anonymity was therefore combined with direct questioning for the remainder of the study. When this simpler methodology was utilised we felt people responded with a reasonable degree of openness, however we were aware of some resistance to discussing questions of a sensitive nature amongst a few respondents.

Educational Activities

Child and adult responses to the survey questionnaire, combined with key informant interviews regarding saiga education, allow recommendations to be made about the future direction of environmental education activities on the Ustyurt. It is encouraging to see both students and teachers are enthusiastic towards environmental education. Teachers in schools 26 and 54 were particularly positive about Saiga Day and its associated activities. The observed widespread support for the education program amongst educators and local institutions is a very encouraging sign for the future development of education-based activities across the Ustyurt.



Child participants

The findings of this study support suggestions made by local teachers that the education program is having a positive impact on child knowledge of saigas, with students who have attended Saiga Day and educational activities exhibiting significantly better knowledge than those who had not experienced the education program (Figure 3). This result is particularly impressive as the control pupils (those from Kubla-na Ustyurt) had received books about saigas from the SCA and undertaken a minor amount of education work in the school in the past year. Despite receiving these books, it was only children who had experienced the actively taught education program who exhibited higher saiga knowledge. The majority of children in both Jaslyk and Karakalpakia had attended educational activities yet the scores of a small number of non-attendees were sufficient to prevent the village a child lives in explaining a significant amount of the variation seen in child knowledge scores. The finding of a small number of children who had not attended the school-based educational activities in Jaslyk reinforces the suggestion that the existing education program increases child knowledge but also indicates that it is not currently reaching all of the target audience. The children in Jaslyk who had not been reached by the education program reported that they did not, or rarely, attend school and lived in the poorest district of Jaslyk. These children are the most likely to be related to adults who fit the demographic profiles of those involved in saiga poaching (Kühl *et al.* 2009). Methods of involving these children in future activities

need to be considered in order to make sure that the influence of education reaches into the households of those most likely to be involved in poaching or consuming saiga meat.

The existing education activities are well received by children, with 100% saying they wanted to attend Saiga Day and that it was suitable for all age groups. These statements are backed up by observations of almost universal attendance of Saiga Day by pupils of the target schools, either this year or previously, in villages where it has taken place. However there is an apparent trend of decreasing attendance this year amongst older (14-16 year old) respondents. Sample sizes are too small to draw strong conclusions but it should be noted that teenagers appear less likely to attend Saiga Day than younger children. Further evidence of the positive reception to educational activities is evident, with all respondents describing the educational activities they were involved with as “fun” or “fun and I learnt new things about saiga”. Whilst only nine children reported that they did not learn new things about saiga these children had significantly lower knowledge scores and were significantly less likely to mention humans as the most important threat to saiga (Figure 6). As not all children take part in the same activities it may be that a small subset of children are not undertaking the most educational of the activities included in the current program. The small number of respondents prevents any conclusions about common demographic factors amongst this group however it appears unlikely that these would be influential. Future monitoring of the education work being undertaken on the Ustyurt plateau should determine which students are not picking up on the educational content of activities with a view to increasing the number of students that report learning new things about saiga to 100%. Two teachers mentioned that they were keen to acquire new sources of information on environmental topics and a wider range of activities to carry out with children. The deputy head of education in Jaslyk was concerned about children becoming bored as a result of repeated exposure to the same activities and as a result was keen to increase the diversity of activities on offer. Providing a breadth of learning opportunities is a promising way of increasing the number of students who find the education program both fun and informative.

A key observation of this study is that children only exhibit significantly elevated knowledge scores when they have definitely been involved in more than one year's worth of education activities (Figure 4). Howe *et al.* (in press) also note the importance of repetition of conservation messages in order for a significant impact on public awareness of saiga to be achieved. Associated with this result were observations that older students had significantly higher knowledge and were more likely to state that anthropogenic actions are

a key threat to saiga populations. Older children will have had more opportunities to learn about the species informally through friends and family and will also be more likely to have experienced at least two years worth of general school-based education.

Saiga Day is improving child knowledge of the species (Figure 3), however the content of pupils' responses suggests that their acquired knowledge has a strong ecological component and that a stronger emphasis needs to be placed on the teaching of saiga conservation. When children were asked to tell the interviewer a fact about saigas only three immediately thought to describe the dramatic decline in saiga numbers or efforts to conserve the species. This difference suggests a strengthening of the conservation component of educational activities might be necessary. It was also observed that children who had attended school-based education were no more likely than those who had not to recognise that humans were a threat to saiga populations. Considering that 50% of non-attendees already recognised anthropogenic activities as a threat to saiga it would be harsh to conclude that the absence of a significant difference between the two groups indicates that the existing education program is failing to meet its objectives in this respect. By increasing the conservation emphasis of educational activities it may be possible to inform the 25% of education attendees who did not mention humans as a threat to saigas and increase recognition of the fact that humans represent the largest single threat to the species. Child awareness of the extent to which the species has declined is important to address to ensure that shifting baseline syndrome (in which previous states of nature are forgotten, either between generations or over time by individuals) doesn't result in a reduced recognition of the need to restore saiga numbers (Papworth *et al.* 2009).

Shifting baseline syndrome is already a concern in the Uzbek Ustyurt; whilst adult villagers would mention frequent past encounters with the species no school children reported having seen a living saiga. Several students mentioned that they would like to bring live saigas to the schools as part of Saiga Day, whilst others mentioned the possibility of going to museums in Nukus which have exhibitions about saigas. The Deputy Direct of Education in Jaslyk, who is heavily involved in saiga educational activities, mentioned such an excursion as a possibility. As one of the students stated, "*as many students as possible should be included in excursions*". Increasing the capacity of the schools to take more than a single busload of students would certainly be a positive move.

Involving parents in excursions and similar activities is one way that educational messages can reach older generations (Vaughn *et al.* 2003; Damerell *et al.* in review.). Parents are

already being made aware of educational activities that are happening in school via their children, with 86% of respondents reporting telling their parents about the saiga-based activities they had undertaken. Encouragingly the majority reported discussing topics related to saiga conservation. Intergenerational knowledge transfer from children has been highlighted as a reason for focusing education on children (Leeming and Porter 1997) and children's influence on household water conservation behaviour has been demonstrated (Damerell *et al.* in review.). When interviewing parents, PD was often shown drawings or poems produced by their children as part of the education program. These items were produced with pride, especially when the child had won a prize for their creation. Having children produce items that can be taken home appears to be an efficient and locally effective way of enabling children to introduce their parents to the topics they have been covering.

There was a desire amongst some children to expand pupils' role in education activities from a passive recipient to an educator, with students stating that *"I would like to tell everyone how saiga live and using materials from the internet and movies"*; *"I would like to organise everyone in the village and ask their opinions"*; *"...it would be good if children could represent their views at the Saiga Day event"*. Such views are extremely encouraging, as students have been shown to be potentially effective educators (Evans 1996; Damerell *et al.* in review). This enthusiasm for increased involvement with environmental education, combined with schools' increasing independence from SCA and creativity in the activities they are organising, suggests they may be ready to expand the extent to which environmental education features across school activities in general.

Wildlife clubs are frequently used as a tool for raising pupil awareness about a myriad environmental issues and fostering eco-centric attitudes amongst attendees (Thomas & Thompson 2004). Whilst there are some logistical hurdles to tackle before wildlife clubs could be established at schools in the Ustyurt, the findings of this study suggest that the foundations are in place. All of the adults interviewed for this survey disagreed with the statement *"teaching children about saiga is a waste of time"*; the response of one father, *"I strongly disagree, we should be teaching children about all our nature"* seemed indicative of community-wide attitudes. This feeling that children should learn about their environment means parents are unlikely to object to an increase in the amount of environmental education and may show a willingness to assist in the running of a wildlife club. Children were very positive about environmental education activities and teachers reported, *"The children want more Saiga Day"*. A vital final component, willingness on behalf of the school

and teachers to support such an endeavour, was also present. School 54 has already shown independence and initiative in organising environmental education activities by taking 20 children on an excursion onto the plateau. Staff and students were both enthusiastic about the experience and the children are apparently particularly keen to see fish and forests next time. Increased frequency of environmental education activities was also a recommendation of the Village Head in Jaslyk who said “*it would be very good if it [Saiga Day] had a more regular presence, more than once or twice per year to re-enforce messages.*”

Some interesting and unexpected findings related to ethnicity were made during the course of the investigation. When combined, they paint an interesting picture about how people perceive their relationship with conservation actions taking place on the Ustyurt. When pupils were asked “Where do saigas live?” 9 respondents mentioned Karakalpakstan and two respondents mentioned Karakalpakstan and/or the Ustyurt plateau but not Uzbekistan. A similar differentiation between Karakalpakstan and outside locations was seen when children were asked who ran Saiga Day; 40% of respondents who felt they knew stated that it was being run by outsiders, either naming Elena Bykova and Alexander Esipov or giving answers like; “*People from Tashkent, the Russians from Tashkent*”, “*.... maybe its foreigners like him (pointed at PD)*”, “*those people from abroad, Germany or somewhere*”. Amongst adult respondents a fifth felt that Saiga Day was being run by “foreigners” with one man asking “*where are the saiga conservationists from Jaslyk, everyone trying to save saiga is foreign*”. One simple method of helping people to recognise local efforts to conserve saiga would be through increasing awareness of the embroidery scheme, which was founded and is co-ordinated within Karakalpakstan, and additional locally-based efforts such as the participatory monitoring scheme. A strong feeling of local identity also provides the potential to promote the saiga antelope as a symbol of Karakalpakstan and the Ustyurt.

Adult Attitudes

As reported by Kühl *et al.* (2009), attitudes towards saigas were very positive in the surveyed villages. No respondents exhibited negative attitudes towards the species (Figure 7). This is encouraging for the prospects of conservation projects being implemented in the area as positive attitudes have been shown to assist the successful implementation of community-based conservation interventions



Housing in Karakalpakia

(Inamdar *et al.* 1999). Kühl (2008) hypothesised that attitudes towards saigas were strongly positive because they were viewed as a flagship species of the steppe and had deep cultural connections. Despite using a more focused measure of attitudes towards saigas, this study found no socio-demographic variables were able to predict the observed distribution of attitude scores. However respondents' answers to specific questions and their justifications for these answers do give important insights that can be used to make recommendations for future outreach strategies.

“People in my community should learn more about the saiga” was one of the most frequently disagreed with attitude questions. All of the respondents explained their disagreement by indicating that they felt they already knew everything they needed to about saiga. The presence of such attitudes within the community, given that these attitudes were seen at low levels, is probably of limited concern from a planning point of view. It may be possible to overcome any disinclination to attend events like Saiga Day amongst people who feel that they already have a strong knowledge concerning the species by utilising respondents' eagerness to watch television programs about the species. A couple of respondents highlighted the value of television as an outreach medium by saying it was the only place that people could see saigas these days. Media campaigns for raising awareness of saiga have been shown to be successful in Russia (Howe *et al.* in press) and could prove to be an effective way of bringing information into households. A large majority of sampled households had a television, which was frequently watched for large portions of the day (pers. obs.). We were also able to associate the commonly held view that hunting saigas would lead to bad luck or harm coming to yourself or family members to an old Soviet film shown around 15-20 years ago. The fact that this film's message seems to have founded an ongoing social meme demonstrates the inherent potential of visual media to have a lasting influence on people's attitudes.

The prevailing positive attitudes towards saigas explain, at least in part, why no difference in attitude scores was seen for adults who had and had not attended Saiga Day. With attitudes already reported as very positive the impact of attending such an event could only register a minimal difference in attitudes (as scored by the survey instrument). Seeing such a positive attitude amongst respondents contrasts with the finding that almost 50% of interviewees agreed that adults in their community believe saiga hunting is acceptable and over 70% said that people in their community did not believe eating saigas was a bad thing to do. This disparity between observed attitudes and reported social norms may suggest that villagers are unaware of the extent to which others in their community positively

regard saiga antelopes. In order to address this issue an increase in community-wide integration with conservation initiatives and personnel may be beneficial. It may also be that as a traditional game species there is no dichotomy between holding positive attitudes towards saigas and also believing that hunting and eating saiga meat are acceptable activities. Addressing this possible explanation is best achieved through continuing to highlight the threatened status of saiga and the impacts of hunting, even for personal consumption.

Fortunately a ready made solution is already in place in both Jaslyk and Karakalpakia, where significant differences are seen in the responses to social norm questions between attendees and non-attendees of Saiga Day. There was no difference between sub samples in their belief that that others in their community feel the same way about the importance of protecting saiga as they do, so attending Saiga Day does not make you feel that you hold different opinions to others. It does appear, however, that attending Saiga Day means you believe that others in the village have a more conservation-orientated view of saigas; attendees of Saiga Day reported that no-one in their village believes saiga poaching is acceptable and two thirds reported that people believe eating saiga is bad. These findings suggest that attending Saiga Day results in adult members of the community holding social norms that are closer to people's actual beliefs and that people do not realise how eco-centric their fellow villagers are unless they have attended Saiga Day. This is a highly significant result. The theory of planned behaviour (Ajzen 1991) hypothesises that social norms influence behaviour. It is therefore predicted that as a result of attending Saiga Day people have an increased chance of shunning saiga poaching and are less likely to purchase saiga meat.

In line with Kühl *et al.* (2009), the study suggests that attitudes do not predict behaviour particularly in relation to the consumption of saiga meat. When asking respondents to comment on the appropriateness of eating saigas a key observation was that respondents were disagreeing that community members felt consuming saiga meat was "a bad thing to do", without linking the activity to the conservation of saigas. Instead respondents appeared to consider the statement from a more personal viewpoint and were disagreeing that eating saiga was "a bad thing to do" because it is not poisonous, a depraved act or an otherwise suspect activity. We were also told "*buying saiga meat is not a bad thing because it is cheap*". This failure to associate saiga meat eating with species conservation when asked to judge its merits has clear implications for future conservation action. The most frequent justification received for answers disagreeing that eating saiga was a "bad thing to do" was

that saiga meat has medicinal properties. We were frequently told that saiga meat could heal the sick because saiga antelopes “*eat special grass on the steppe*”. Medicinal properties have not previously been mentioned as an attractive feature of saiga meat, with past reports focusing on its cheap price. Within the Ustyurt many locally produced or traditional products are referred to as medicinal, meaning that they have health benefits rather than curative properties. With the addition of perceived health benefits to eating saiga meat amongst some residents, future research into markets for saiga meat may need to consider the elasticity of saiga meat pricing: Meat that has health benefits is likely to be more inelastic in price than meat bought purely for its cheapness, and therefore it will be harder to influence purchasing behaviour through price manipulations.

In addition to not associating meat eating with the issue of saiga conservation a few respondents did not consider hunting saiga for the purpose of local meat consumption to be a threat to the species; “*there would be no reduction in saiga numbers if people just hunted for their own meat and didn't sell the horns*”. Kühl (2008) also noted a low recognition of saiga meat as a driver of saiga population collapse; when asked what the drivers of saiga poaching were, only a quarter of her respondents mentioned the market for meat and then only as a secondary driver. As a result of these findings, educating residents about saiga meat's lack of specific medicinal properties or health benefits and inculcating understanding about the impact of meat hunting on saiga numbers should be a priority for outreach programs on the Ustyurt. Kühl (2008) recognised the need to address the issue of hunting for meat after demonstrating that in Kazakhstan it was more profitable for poachers than horn sales. Here we demonstrate that the issue must also be addressed at the community level. Preliminary evidence shows that community outreach has an impact on the social norms people hold towards saiga meat consumption (Figures 8a & 8b) and a positive effect on children's factual knowledge about saiga (Figure 3a). As a result conservation practitioners should feel confident that addressing detrimental attitudes towards meat consumption is well within their current capacity.

Summary of recommendations for the schools based education programs

- 1) Work towards engaging all children, including those who do not regularly attend school.
- 2) Ensure all children not only enjoy the educational activities but also take part in those that have larger learning components.
- 3) Widen the range of educational activities available; those that combine fun activities that lead to interaction with the surrounding steppe ecosystem and have a strong conservation message should be prioritised.

- 4) Reinforce learning, either by increasing the quantity of environmental education in the formal syllabus or establishing informal learning opportunities such as wildlife clubs.
- 5) Expand the conservation content of the program; children are currently more comfortable with saiga ecology than saiga conservation.
- 6) Schools should be encouraged to undertake excursions and offered support to ensure that these trips are available to as many children as possible.
- 7) Creative activities that result in participants having items to take home and show parents; this will expand the audience of the school-based education to include parents and should be encouraged.
- 8) Make Saiga Day an evening or weekend event and publicise it widely in order to increase the number of adult attendees. Consider staggering the event in Karakalpakia so that both schools are not having their Saiga Day on the same date.
- 9) Establishing wildlife clubs would give children the opportunity to take on a more active role in planning and organising Saiga day thereby increase student ownership of the event.
- 10) Establish wildlife clubs initially only in schools where staff are sufficiently dedicated to take on this considerable undertaking
- 11) Ensure that parents and children understand that conserving saiga is not only a goal of outsiders but also comes from within Karakalpakstan and their villages. Presentations by police and participatory monitors at Saiga Day and an increased ownership of education activities by the schools are potential steps towards achieving this.
- 12) Explore options relating to media campaigns about saiga conservation, TV broadcasts, village film screenings, and local printed media.
- 13) Emphasise the damage to saiga populations and illegality of purchasing and eating saiga meat.
- 14) Counter local beliefs that saiga meat has medicinal properties or specific health advantages
- 15) Include education activities that are appealing to teenagers, especially boys, who are not involved in the embroidery scheme

The alternative livelihoods scheme

A simplified form of a framework for assessing the suitability of community based conservation initiatives (Salafsky *et al.* 2001) made an excellent structure on which to base this initial assessment of the embroidery schemes effectiveness. Whilst some areas of the program clearly need to be addressed there are many positive messages to be taken away from the current situation (Table 3).

The “enterprise portion”; the side of the project concerned with the production and the sale of items, demonstrates both the project's biggest weakness and some notable strengths of the scheme in its current format. It is also the area that will require the greatest amount of work in order to help the scheme to meet its ambitious goals.



Saiga embroidery, Jaslyk

A key challenge for the embroidery scheme is to become self-supporting through increasing market demand. The items produced would be attractive to a western market and could also be sold at the main tourist attractions in Uzbekistan (Khiva, Bukhara and Samarkand). A detailed business analysis needs to take place in order to ensure that the embroiderers are utilising their skills to produce desirable products for profitable markets. Salafsky *et al.* (2001) identifies good market research as a vital component of a successful project but notes that the enterprises he investigated struggled to pay for high-level management skills. The embroidery scheme has limited funds available for this vital research, however the SCA will be carrying out a business planning exercise in 2012, focussing both on western markets and local capacity.

A key strength of the embroidery scheme is its low complexity as a result of readily available materials and a strong local skills base. Group management skills are one area that may need to be invested in to ensure that the local groups form robust organisations. Salafsky *et al.* (2001) highlights good management and bookkeeping skills as particularly valuable. This will be especially true once greater profitability is brought to the scheme.

The extent of the scheme's link to conservation is an area that needs to be addressed. The scheme, being targeted at women, is removed from the resource user (the poacher) but connected to resource exploitation through a reduction in the local demand for saiga meat and changes in social norms (Figure 2). Whilst it is clear that both embroidery groups are still getting established it appears that the principal objective of saiga conservation could be emphasised to a greater degree. A former member of the Jaslyk embroidery group who had been involved for a year until she got married asked “*So what is the link between SCA and embroidery, how does embroidery help saiga?*” at the end of our interview. Making all embroidery group members explicitly aware of the objectives of the initiative and how they

are to be achieved will enable members to be aware of their responsibilities and focus community-wide awareness as the principal reason behind the scheme's establishment.

Closely linked with increasing access to profitable markets is the need to increase cash benefits to involvement with the scheme. The approximate calculations given in the results section clearly indicate that increasing the per-embroider income is a vital step for the scheme's progress. By targeting more lucrative markets this should be an achievable goal. A former embroiderer said that for involvement with the scheme to be a livelihood, rather than a hobby with a small financial benefit, they would need to make 300,000 Som (~\$180) per month. Because the products the embroiderers produce are high quality hand crafted items there is every reason to believe that incomes from involvement with the scheme can be raised to a sufficient level to reach its objectives. As the scheme develops it will be important for participants' trust in the program that they feel they can rely on the leaders to ensure they are paid promptly.

Whilst the financial side of the scheme is in need of some careful attention the non-cash benefits of involvement are one of the strongest points for the scheme in its current form. The women genuinely enjoy attending the embroidery centres and in addition to learning new skills are able to socialise in a casual atmosphere. Uzbek society, particularly in the rural areas, is very traditional in terms of women's roles and the all-female groups give the participants a place where they can relax in an informal setting. The presence of girls from Bostan, who stayed with friends during the week so that they could attend the Karakalpakia embroidery group, highlights the high attractiveness of the program, even without a strong financial incentive.

The fourth area of the scheme requiring attention is the demographic of the participants currently involved. Women in the Ustyurt tend to marry in their late teens or early twenties. It is only after this that they begin to have some control of household spending and could make decisions regarding meat purchases and the activities of their male relatives (Figure 2). Currently participants are leaving the embroidery program just as they become capable of undertaking the actions that the scheme's goals are based on. It is possible that if more lucrative markets can be reached, married women will be more willing to continue their involvement with the club. Part time involvement due to family commitments will require a recalculation of the pricing structure for products. If the alternative livelihoods scheme is to be made more effective then married women with families need to be included in the

program and a recruitment drive within poorer districts undertaken so that those who whose families are most dependent on saigas for their current livelihoods can be targeted.

Factors relating to the different stakeholders involved in the scheme are a particular strength of the embroidery scheme. The currently leadership structure seems robust and the leaders are committed. Having a clear understanding of leaders' goals and future plans, such as Saliya's desire to retire in a few years, means plans can be put in place to make any future transition as seamless as possible. The scheme also enjoys strong support from participants, community members, the SCA and local politicians. The continuation of this support will be essential as the scheme looks to grow. Careful monitoring of potential conflicts should be undertaken, especially if the scheme becomes a lucrative source of income for participants.

An integrated conservation approach

Both the schools-based education programme and alternative livelihood scheme have been shown to have some commendable strengths but both require further action if they are to maximise their potential impact on saiga conservation. Kühl (2008) noted that proposed conservation interventions of the Ustyurt Plateau were unlikely to work in isolation and this study has identified several opportunities for collaboration between different facets of the saiga conservation strategies currently being implemented.



Local, national and international groups collaborating for saiga conservation

A greater involvement of the police force in conservation activities outside direct law enforcement is one way in which the illegality and potential repercussions of saiga poaching and meat consumption can be highlighted. The head of the Jaslyk police and one of his officers who had attended Saiga Day with his family expressed an interest in police involvement with education activities including giving talks to the students *“Preventing crime, including saiga poaching, is an important part of my job”*. Teachers also said that they would appreciate closer collaboration with the police, as this would allow them to be clearer on the legal aspects of saiga conservation. By publicising the role of local people in

saiga conservation, the belief amongst some respondents that saiga conservation was the sole domain of “foreigners” could be countered.

The embroidery group in Karakalpakia has already formed a small link with the school-based education work by taking orders for children’s Saiga Day costumes. This link could easily be strengthened and expanded to Jaslyk. With many of the embroiderers still attending school and the Jaslyk group being based in a school building, there are existing links that can be built on. Similarly once wildlife clubs are established they will need relatively simple activities to undertake whilst staff and volunteer capacity is built. An ideal first term activity that would link the embroidery group in Karakalpakia and school children could be the decoration of the new embroidery centre. The building is in need of a through re-decoration and the creation of a saiga-based biodiversity mural could be an excellent first activity for a wildlife club as it becomes established.

Teachers were keen to grow Saiga Day celebrations into a village wide event. Doing so would require involvement from many groups and be an excellent way of illustrating that saiga conservation is a community-wide responsibility and that there is a strong movement towards achieving the re-establishment of the species in the area. As one teacher put it *“activities at the village level would show that nature conservation is for all”*.

Conclusion

The Ustyurt harbours one of the four main populations of saiga antelopes, a population that is still declining. Whilst this continuing decline is worrying, the species has a demonstrated capacity to recover when hunting pressure is removed. This study has shown that the community-based conservation initiatives being implemented in the Uzbek Ustyurt have established a strong foundation from which meaningful saiga conservation can be achieved.



The edge of the Ustyurt plateau

School-based education initiatives are increasing participants' knowledge of the saiga antelope, and for a notable proportion of attendees awareness of the threat posed by human actions has also increased. Most encouragingly of all, the schools that are implementing educational activities are showing signs of being increasingly independent and ready to take responsibility for defining their own aims and objectives. Saiga Day is showing adults how common positive attitudes towards saiga antelope are within their communities, and as a result the event is influencing attendees' behaviour-defining social norms. Opportunities exist to increase parental involvement with educational activities and these should be explored in detail.

Whilst the educational program is close to achieving its objectives the alternative livelihood scheme requires a greater level of input in order to achieve its objectives. After a period of fluctuation and changing management, the embroidery scheme now has a strong foundation from which it can progress. The girls and women who are involved enjoy embroidery and there is a strong social aspect to involvement. Careful consideration of markets for the high quality products being produced is necessary to make the scheme financially viable. A mechanism for including a larger number of married women and those from poorer households is a second crucial step that needs to be taken. At all times the primary conservation objective of the scheme, and the mechanisms through which it seeks to achieve this, needs to be made clear to all those involved. The scheme has a strong and passionate leader in Aizada, and local leaders who are keen to see the scheme expand into a viable business. With a little more external assistance there is no reason why the existing embroidery program cannot grow into powerful tool for saiga conservation.

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Appendix 1

Questionnaire

Dear Sir or Madam,

I am a student from Imperial College London.

I am interested in learning more about the knowledge, opinions and lifestyles of people who live and work on the Ustyurt plateau. As part of my studies I am asking people to answer the following questions. There are no wrong or right answers to the questions it is the opinions of local people that interest me.

The questionnaire is anonymous and I will not record your name.

Thank you for sparing the time to take part in this study.

Peter Damerell

Research Scientist

Imperial College London

Date:	Interview No:	Village Name:
GPS:	Enumerator's Name:	

1) Gender: 1) Male 2) Female

2) Age:

a) < 20

b) 21-40

3) Education:

a) Secondary and Higher education

b) Primary and Vocational education

c) 41-60

d) > 60

4) Residency within this settlement?

_____ Years

5) Employment status:

a) Unemployed

b) Employed

c) Retired

d) Student

6) Are you or a member of your extended family involved in the embroidery program: NO YES (if the answer is no, advance to question 7)

How are you related to the person involved in the embroidery program: _____

Do you know who set up the embroidery program: _____

What is the purpose of the embroidery Scheme: _____

Other people have suggested the following purposes of the scheme.

Which of these purposes do you believe is the most important?

a) Preserve traditions

b) Fun activity for girls

c) It means saiga hunting is no longer necessary

d) Provides additional income for a family

e) It empowers women

7) Number of family members living in the house: _____

8) Are there any children in the household? NO YES

If yes, please state **The number of children** _____

Please indicate how much you agree with the following statements.

9) Protecting the saiga is a low priority:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

10) People in my community should learn more about the saiga:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

11) I would like to watch a TV program about saiga in the wild:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

12) I would like to know how scientists are investigating saiga:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

13) If there were more saiga close to my village it would benefit local people:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

14) I would like to know more about the saiga lifestyle:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

15) Teaching children about saiga in school is a waste of time:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

16) If there were no more saiga in the world it would be a bad thing:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

Start RRT

17) Have you eaten saiga meat in the past 12 months? NO YES

18) Has anyone in this household bought saiga meat in the last year?

NO YES

19) Have you seen saiga in the last year? NO YES

20) Have people in this village hunted saiga. . . .

In the past 12 months NO YES

21) Have members of this household hunted Saiga. . . .

In the past 12 months NO YES

End RRT

22) I feel the same way about the importance of protecting saiga as other people in my village:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

23) Most adults in my community believe that hunting saiga is acceptable:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

24) In general people believe that eating saiga meat is a bad thing to do:

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree
 Adult Saiga Day (only for towns where Saiga Day has been held)

25) Have you heard about Saiga Day? NO YES

26) Did you or any member of your family attend?

This year NO YES

In past years NO YES

If no, why not? _____

If not attended advance to question 37

If yes, who attended?

a) Myself b) My child
 c) My spouse d) 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?

a) Children b) Teenagers
 c) Families d) Everyone e) Other _____

27) Did you learn anything new about Saiga at the event? NO YES

If yes, what was this? _____

28) Have your attitudes towards saiga changed due to Saiga Day?

NO YES

If yes, how? _____

29) Do you think the event achieved its aims of raising awareness of Saiga related issues in an informative and engaging way? NO YES

30) Will you or your family be attending next year? NO YES DON'T KNOW

31) Who runs Saiga Day? _____

Child Saiga Day

32) How old are you? _____

33) Gender Boy _____ Girl _____

34) Can you tell me a few things about saiga?

What do they eat? _____

Which countries do saiga live in? (one point per range state named) _____

Can you tell me something interesting about saiga? _____

What are saiga biggest problems (name 3), 1) _____

please put these problems in order of 2) _____

Importance: 3) _____

35) How much did you know about saiga before this year?

a) A lot b) A little bit c) Nothing

36). How much do you think you have learnt about saiga this year?

a) A lot b) A little bit c) Nothing

37) 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

38) Did you go to Saiga Day: This year YES NO

In past years YES NO

If YES

Who did you go with? _____

Where was it? _____

If NO, end questionnaire

39) Did you want to go? YES NO DON'T KNOW

Why was this? _____

40) Have you talked to anyone at home about Saiga Day? NO YES

What did you tell them? _____

41) How would you describe Saiga Day? (Tick as many as you like)

a) A fun day b) A fun day, and I learnt new things about saiga

c) I didn't like it d) boring

42) Who do you think Saiga Day is for?

a) Children younger than 10 b) Adults

c) Children over 10 d) Everyone

43) Who runs Saiga Day? _____

44) What was your favourite part of Saiga Day? _____

54) Were there any parts of the day you didn't enjoy? NO YES

If so what where they? _____

55) What do you think we can do better for Saiga Day next year?

Thank you for taking part in this study.