



DESIRE WB-3 Stakeholder Workshop 2 report

WP3.3 Stakeholder Workshop 2 report - held in Mopopi, Botswana 3rd and 4th October 2008.

Authors: Dr. L. Magole, Dr. J.R. Atlhopheng, prof. R. Chanda

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University of Botswana, Gaborone, Botswana.

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Workshop Report - English summary

Stakeholder workshop 2

Selection and decision on technologies / approaches to be implemented



Biogas production to conserve woody vegetation (Photo: RIIC, Kanye, Botswana)

Name of the study site: **Boteti, Botswana.**

Date of workshop: 3rd - 4th October 2008.

Author(s): Dr L. Magole; Dr J.R. Athlpheng; Prof Chanda

I General information**A) Workshop**

Workshop venue: Mopipi

Workshop moderator(s):

- Dr. L. Magole (WOCAT Facilitator & Water harvesting)
- Dr. J. Athlopheng (WOCAT Facilitator & Water harvesting)
- Dr. K. Mulale (Biogas/Solar)
- Dr. W. Mphinyane (Game Ranching)
- Mr. R.J. Sebegu (Biogas/Solar)
- Mr. T. Mogaetsho (Biogas/Solar)

List of workshop participants:

Mr./Ms.	Name	Stakeholder category and institution (e.g. land user, researcher, NGO, GO, CBO)	Local/external participants? (L/E)
Mr.	Monnayomongwe Baganetseng	Land user	L
Mr.	Ketso Isang	Land user (Village Herdman)	L
Mr.	Bantiretse Gaopelo	Member of Village Trust (CBO)	L
Mr.	Temogo Sechele	Land user	L
Mr.	Vembrukee Sakarea	Land user (Village Herdman)	L
Mr.	Letebele Motlogelwa	Land user (Village Development Committee Chairman) (CBO)	L
Mr.	Tsogang Ramotsepane	Non-Formal Education Teacher (GO)	L
Mr.	Tshabatau Moloji	Land user	L
Mr.	Leikantsemang Setshego	Land user	L
Ms.	Bareetsi Poromate	Land user	L
Ms.	Bashanduki Monageng	Land user	L
Ms.	Bantshellele Basaleng	Member of Village Trust (CBO)	L
Ms.	Galekitane Mataeyo	Land user	L
Ms.	Basadi Karija	Land user	I
Ms.	Barasitse Bamotshamikisitse	Land user	L
Prof.	Raban Chanda (Male)	Researcher	E
Dr.	Lapologang Magole (Female)	Researcher	E
Dr.	Wanda Mphinyane (Male)	Researcher	E
Dr.	Julius Athlopheng (Male)	Researcher	E
Dr.	Kutlwano Mulale (Male)	Researcher	E
Mr.	John Molefe	Researcher	E
Mr.	Thuso Mogaetsho	Rural Industry Innovation Centre (RIIC) Researcher (Parastatal)	E
Ms.	Mercy Moemedi	Researcher	E

Comments:

Although many participants from workshop 1 attended this workshop, some community leaders missed the workshop because of other engagements. There was an important meeting at the traditional meeting place (the Kgotla) which was presided over by the village Chief. The village councillor who attended throughout workshop 1 could not attend because of other official engagements. Also the workshop was held immediately after a major holiday around which time Government officials typically take time off work. It has also proven to be difficult to bring Government officers (especially those from natural resources managing institutions) to these meetings because of tight and clashing schedules. However the officers are informed and are willing to support the land users/farmers in the project activities. Regarding NGOs it must be noted that there are no NGOs (environmental) operating in the area. The project has instead been collaborating with the local environmental community based organizations (CBOs).



Plate 1: Dr. Lapologang Magole facilitating Workshop 2 (Photo: R. Chanda)

Background

The Mopipi village and associated settlements has about 7000 inhabitants. Most of the inhabitants are farmers, mainly pastoral farmers. Limited molapo (flood recession) farming is practised seasonally in the formerly flooded floodplain of the Boteti River. In here better soils (Luvic), as opposed to sandy (Arenosols) further from the river, tend to have better nutrient status and moisture retention. Thus the major land use is agricultural. The other major village of interest within Boteti sub-district is Rakops (Tsienyane). These two villages are about 70km apart, and share the same type of land use styles. Close to these villages are the major landmarks like the Makgadikgadi Pan National Park (to the north), the Central Kalahari National Park (to the south) and the Orapa/Letlhakane diamond mines to the east. Thus the major villages' grazing area extent is affected by these other land uses.

The main types of degradation in the Mopipi area relate to overgrazing – the low vegetative recovery during droughts is overwhelmed by the large cattle numbers. There is therefore extensive vegetative removal. Once the soil is left bare, the fine grey soil is then blown away by wind. This large, flat and extensive plain thus becomes dominated by dust during the dry and windy months of the year (mainly around August). The other noted type of degradation is bush encroachment and the invasion of alien species – some vegetation types beginning to be dominant where there was much more diversity before. Bush encroachment is closely related to overgrazing, and is most evident close to the settlements and around cattle posts.

The droughts and human impact or land use practices like extensive cattle grazing may be the key factors in rangeland degradation in the area. This implies that the cyclic droughts lead to reduced vegetative cover, and the high cattle numbers leading to overgrazing. This overgrazing then offers op-

portunities to wind dominated processes (dust) and to high cattle mortality. The droughts directly mean less surface water resources, in pans, lakebeds and the Boteti River (if the Angolan Highlands are also affected). The pressure then builds on groundwater, with the result that, the overlying fresh water layer is over-pumped (exhausted) giving way to the denser saline waters in this predominantly lacustrine (evaporite dominated) landscape. Thus according to the locals, the river flows are essential to maintaining good (fresh) water resources.

The most glaring constraining factors for soil and water conservation are poverty (limited financial resources), lack of livelihood alternatives to those which are land based, lack of information on available innovation and technologies and low levels of literacy.

Step 1: Objective

The main issue for the community of Boteti is poverty and they wanted to set an objective that addresses this issue. They argue that the harsh semi-arid environment with poor soils and depleted vegetation has impoverished them as their livelihoods depend very much on natural resources. That whatever intervention or technical help they get should address their livelihood situation. However after a lengthy discussion which explained that DESIRE is an environmental management project they came up with the objective: To reduce the depletion of trees.

Step 2: Selected options and necessary adaptations:

Game ranching

Comment CDE: Game ranching does not seem to be a typical option related to prevention / mitigation of soil degradation / desertification. From what I know it has neither been identified in the 1st stakeholder workshop as a local option nor does it come from the WOCAT database. Where does this option come from, i.e. who brought it into discussion and why?

Answer SST: This was actually one of the leading options that emerged from the 1st stakeholder workshop (please refer to it). The justification is as elaborated in the brief text that follows.

Game ranching is profitable and can bring economic returns from wildlife resources. Some of the income generating activities include game viewing, trophy hunting, selling biltong and live sale to other ranches. Game ranching can promote local tourism by bringing wildlife closer to people. Lodging facilities can be built inside the ranch and handicrafts sold. Game ranching also promotes culture, where the young generation may also benefit from viewing, interacting and relating to wildlife with a stronger sense of cultural understanding. It is noted that totems (tribal name or badge) for the people of Botswana bear mainly names of wildlife species, a cultural practice from time immemorial. Thus game ranching is seen as revival of culture. For these reasons (economic and social) game ranching is a highly favoured option by the community who see their poverty as the main product of an unfavourable environment in which they live. The community also sees game ranching as a solution to the overgrazing caused by livestock. Some of the environmental advantages of game ranching are that it can use marginal areas, which can otherwise not be effectively and sustainably used by the cattle. The Boteti area with poor soils, sparse vegetation, saline water and surrounded by wildlife sanctuaries is a good candidate for this venture. Game ranching also allows for the optimization of the range by having a variety of species as they utilize different niches within the ecosystem, as browsers and mixed feeders, unlike cattle which are grazers only. Game ranches can help in conserving threatened and endangered species, thereby reversing or preventing desertification.

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Plate 2: Two wildlife species exploiting different ecosystem niches

(Photo: Provided by W. Mphinyane)

Rainwater harvesting

Water is scarce and therefore expensive in Botswana. Better water management and improvement of the quality, quantity and efficient storage and utilization of water is necessary. Rainwater harvesting is an effective means of water provision. Harvested rainwater can be very useful especially at lands and cattle posts where water is not provided through standpipes as is the case in the villages. People who have harvested rainwater do not need to travel long distances to fetch water. This is also helpful where ground water is too salty (Boteti area) for human consumption. Plates 3 and 4 indicate the type of water catchment structure and storage facilities common in Botswana and Boteti (i.e. roof catchment and either underground or above-ground storage tanks).



Plate 3: Existing water harvesting structure and underground water storage tank (Mopipi)
(Photo: L. Magole)



Plate 4: Plastic water harvesting storage tanks (green) fitted to residential roof structures (Photo: J. Athlopheng)

Bio gas

Biogas provides a clean, easily controlled source of renewable energy. Cow dung is collected from cattle sheds or, in the case of Boteti, around cattle watering points, mixed with water and channeled into fermentation pits. The resulting gas is produced as a by-product of this fermentation and collected in a storage tank from where it is piped into the user's house. It can be used for electricity production, cooking, water heating and laundry. By using biogas one can save time, use less labor and save trees. The gas doesn't have smoke or smell, so it reduces eye and respiratory irritations. The used cow dung, i.e. sludge, is a better fertilizer and cheaper than manufactured products. Thus with biogas, the final waste product (sludge) is used as fertilizer. It was also indicated that, other organic wastes

like cuttings in the kitchen could be used to generate biogas. Thus a total recycling system incorporating the toilet, kitchen and garden could be part of the set-up.

Comment CDE: *The use of cow dung could lead to a problem in soil fertility. How will this be addressed? Please specify.*

Answer SST: Since cow-dung is collected from around water points and or cattle kraals, not in the open veldt or range, there is no danger of any decline in soil fertility in the range. In most cases, the water points and cattle kraals act as excessive concentration points for cow dung (not suitable for most plants). The points around boreholes, due to excessive manure (cow dung), are devoid of vegetation and have therefore been termed 'sacrifice zones', the sacrifice paid for keeping the cattle industry. Some of the sacrificial zones persist for over 100 years. Thus biogas is mainly seen as halting this process, of creating bald patches on the landscape.



Plate 5: Biogas infrastructure

(Photo: Rural Industries Innovation Centre [RIIC], Kanye, Botswana)

Solar cooker

Sunlight is the fuel. A solar cooker needs an outdoor spot that is sunny for several hours and protected from strong winds, and where food will be safe. Solar cooker would not work at night or on cloudy days. Food cooks best in black, shallow, thin metal pots with black tight-fitting lids to hold in the heat and moisture. One or more shiny surfaces reflect extra sunlight on to the pot. Solar cookers are better than other means because fuel is free and abundant, provide extra income, saves time (food doesn't need to be stirred and would not burn. Solar cooker is portable, allowing solar cooking at work sides, picnics and camping.



Plate 6: Solar at work during Workshop 2 (Mopipi) (Photo: R. Chanda)

Step 3: Criteria for evaluation:

Economic/production	Ecological	Socio-cultural
<ul style="list-style-type: none"> • Education (→ community members hoped to learn skills during piloting. With these skills they can then set up their own enterprises and boost the economic production in the region and the country. The option will therefore be judged for its capacity to bring education in terms of skills and innovation) • Create employment • Profit (→ this relates to gaining profit or gaining returns on all ventures or business/economic initiatives. Returns to outweigh the losses) 	<ul style="list-style-type: none"> • To improve the appearance and the state of the environment by reducing degradation • To protect the ozone layer • To improve harvest (→ here the option would be judged for its capacity to increase and improve harvest, either by ensuring that farming time is not reduced by other tasks such as collection of fire wood and or fetching water OR its capacity to improve soil fertility) 	<ul style="list-style-type: none"> • To promote cooperation, self reliance and volunteerism. • To conserve culture and natural resources • To alleviate poverty

Step 4: scoring of options made by different groups:**Table 1: Village Leaders**

Scoring	To improve the appearance and state of the environment by reducing degradation	To improve harvest	To protect the ozone layer	Profit	To create employment	Education	To alleviate poverty	To conserve culture and natural resources	To promote cooperation, self reliance and volunteerism
Game ranching	5	0	2	5	5	5	5	5	5
Rain harvesting	2	5	2	2	0	3	4	3	3
Bio gas	5	0	5	5	3	5	5	5	2
Solar cooker	4	0	3	3	0	2	0	4	0

Table 2: Other Land users

Scoring	To improve the appearance and state of the environment by reducing degradation	To improve harvest	To protect the ozone layer	Profit	To create employment	Education	To alleviate poverty	To conserve culture and natural resources	To promote cooperation, self reliance and volunteerism
Game ranching	5	0	0	5	5	5	5	5	5
Rain harvesting	4	5	5	4	3	4	4	4	4
Bio gas	5	5*	3	5	5	5	5	5	5
Solar cooker	3	0	4	3	2	3	4	3	2

* Comment CDE: *For me it is difficult to understand how biogas is supposed to improve harvests → what are the arguments used by land users?*

Answer SST: Switching to biogas would entail less time spent on fuel wood gathering and more time for on-farm labour; some of the income gained from sales of biogas could be used to acquire farming equipment, while sludge from spent manure would be used to fertilize farmland.

Table 3: Negotiated scoring adopted by the group

Scoring	To improve the appearance and state of the environment by reducing degradation	To improve harvest	To protect the ozone layer	Profit	To create employment	Education	To alleviate poverty	To conserve culture and natural resources	To promote cooperation, self reliance and volunteerism
Game ranching	5	0	2	5	5	5	5	5	5
Rain harvesting	2	5	2	3.5	2.5	3.5	4	3.5	3.5
Bio gas	5	2.5	4.5	5	4	5	5	5	3.5
Solar cooker	3.5	0	3.5	3	1.5	2.5	2.5	3.5	1

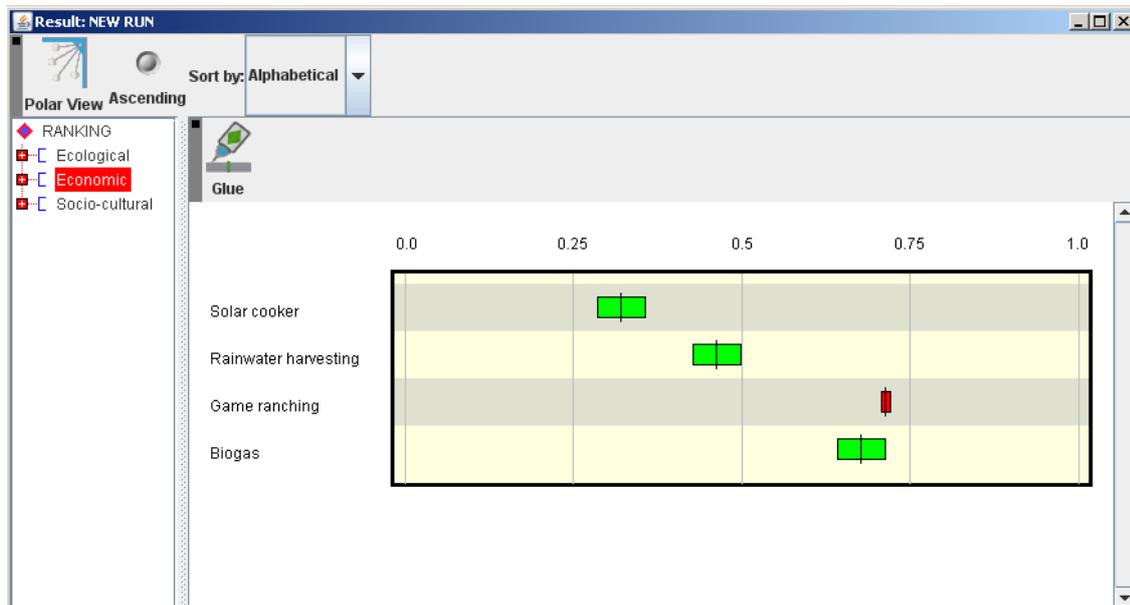
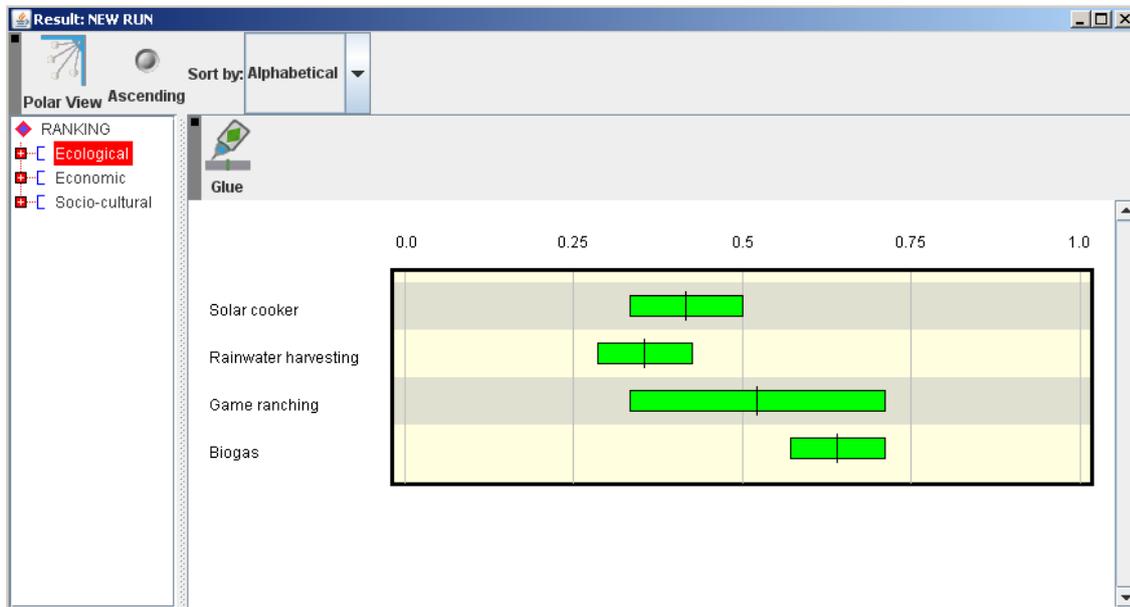
Major differences between stakeholder groups.

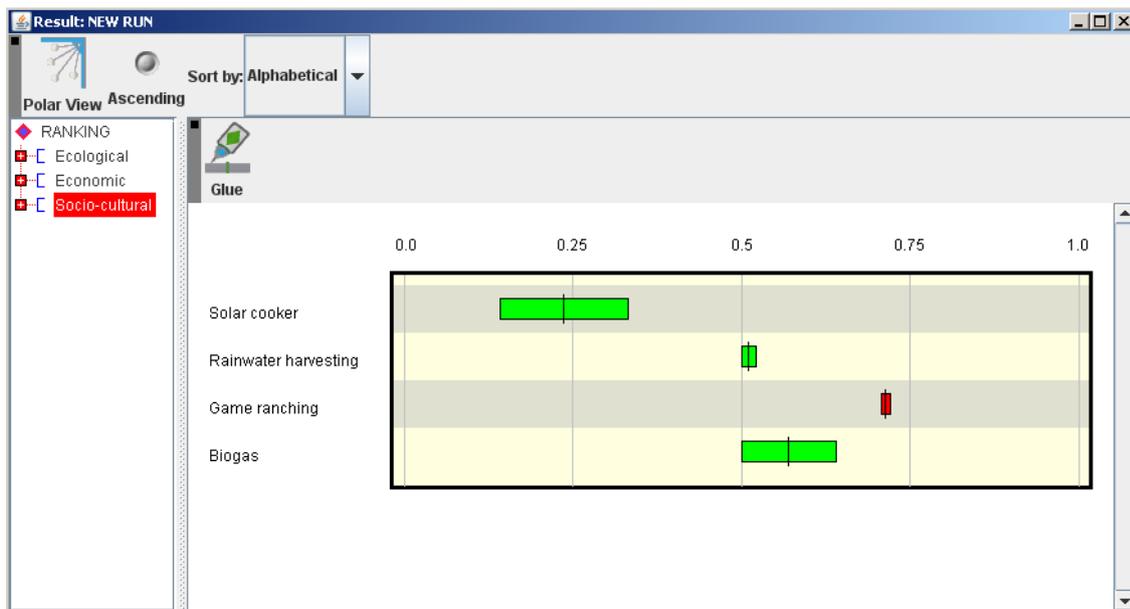
There were major differences which are marked in **bold** on Tables 1 and 2. However the tables and the scoring were discussed to come up with negotiated and agreed scoring as shown in table 3.

Step 5: Ranking criteria

Economic/production	Ecological	Socio-cultural
<ul style="list-style-type: none"> • Education • Create employment • Profit 	<ul style="list-style-type: none"> • To improve the appearance and the state of the environment by reducing degradation • To protect the ozone layer • To improve harvest 	<ul style="list-style-type: none"> • To promote cooperation, self reliance and volunteerism • To conserve culture and natural resources • To alleviate poverty

Step 6: Analysis and interpretation:





Step 7: Prioritization of options:

Bio-gas

Biogas provides a clean, easily controlled source of renewable energy. Cow dung is collected from cattle sheds, mixed with water and channeled into fermentation pits. The resulting gas is produced as a by-product of this fermentation and collected in a storage tank from where it is piped into the user's house. It can be used for electricity production, cooking, water heating and laundry. By using biogas one can save time, use less labor and save trees. The gas doesn't have smoke or smell, so it reduces eyes and respiratory irritations. Sludge is a better fertilizer and cheaper than manufactured products.

Comment CDE: This text repeats what has been explained on page 7. It would be very valuable if you could provide information on the discussions you had, the argumentation used by different stakeholders, their judgments etc.

Answer SST: With the biogas, the discussions included questions on: the source of the raw material e.g. where it will come from; the method of using it in the factory; how often it is topped up; how long it will take to ferment the dung e.g. when cow dung is filled in today, how long will it take for the gas to be ready; how do you tell there is gas; the amount of biogas that could be produced in a day; the level of technical knowhow needed to set it up and run it. Thus issues of implementation and maintenance skills and running costs came up during the discussions. Benefits were also discussed ranging from what economic activities can the gas be used for. Bakery and other catering ventures were identified. It was even suggested that if some form of packaging (bottling) of the gas can be developed it can also be sold to households and businesses and used as a source of energy and income in the village.

Please provide a brief description of the context in which it will be implemented:

The technology will be applied on the communal land.

Comment CDE: Who will benefit?

Answer SST: The community would be the primary beneficiary. In fact, community members did call the DESIRE team from the onset, stating their experience with past projects and indicating that they wanted the benefits to accrue to the community and not individuals. Thus in this instance, it is the vil-

large committees or structures which will take the lead, with the benefits being realized by the community/communities. Both the DESIRE project and community will raise funds to support the technology. Monitoring will be done.

Original land use (before implementation) is communal settlement but might change to commercial/ small business or maybe horticulture.

Land users who will apply the technology

Tick one option per line

Individual/household groups / community cooperative employee (company, government)

Small scale land users medium scale land users large scale land users

Leaders / privileged common / average land users disadvantaged land users

Mainly women mainly men mixed

Step 8: Embedding into overall strategy

Objective	Technology	Commitments made by different stakeholders	Stakeholders	Indication of improvement
To reduce depletion of trees	Biogas	<ol style="list-style-type: none"> 1. To consult with the community 2. Form the committee that will look after the test plot 3. Find a plot 4. Find ways of raising money 5. Provide education 6. Being involved in the day to day running of the project 7. Maintenance 8. Organize evaluation meetings 9. Write reports 	<ol style="list-style-type: none"> 1. VDC 2. The community 3. Committee 4. The committee and Desire 5. The committee, Desire and RIIC 6. The community and Desire 7. The committee and RIIC 8. Desire 9. Desire 	<ol style="list-style-type: none"> 1. Reduction in cutting down of trees 2. More people buy and use biogas 3. Improvement in the lives of people*

* **Comment CDE:** What kind of improvement do you refer to? (income increase, less time used for securing energy supply, etc.?) → How can you observe / measure that lives have improved?

Answer SST: Improvement in welfare would arise from the benefits discussed under Step 7 above. Time saved from firewood collection, jobs created and income gained due to biogas –based enterprises would serve as indicators.

III Evaluation of the workshop

Evaluation of contents and methodology of the workshop:

1. By participants (local and external)

What do you expect to gain from this test implementation?

- Profit for the local communities
- Socio-economic developments (a biogas or any economic venture is taken to bring developments or enhanced infrastructure, economic assets/opportunities for the community. The improvements in people's lives, it was argued to help protect the environment as well as having economic benefits).
- Change in people's lives (this is related to betterment in the standard of living or in people's lives, where there is less hardship, with more opportunities for everybody and working in a sustained/sustainable system or environment.)

What are your fears?

- Gas doesn't smell and this can be dangerous
- Community members failing to cooperate in running the project
- High cost of setting up the biogas facility – where will the funds come from to initiate the project? There was concern that it will take quite some time to start as this depends on the goodwill of the funders. In addition, possible funders may take their time to respond, and a negative response is possible.

What did you like about the workshop?

- Cooperation
- Professionalism
- Education was of good quality (presentation on various technologies)

What advice can you give on how to improve the workshops?

- Participants must learn to respect time
- Provide written reports.

2. By the moderator(s)

Participants were active and participated fully throughout the workshop.

IV Other information

Difficulties encountered: It was difficult to find time which was suitable for everyone. This resulted in a decision to hold the workshop partly over the weekend- and this affected work /social commitments of some stakeholders e.g. attending of funerals. The other difficulty had to do with the use of the facilitator software. It took several attempts to finally release success and display results for participants to view. It needs to be stated however that once we got the tool right it came across as powerful and fascinating for the participants as it for the most part confirmed their scoring.

Changes made concerning the procedure suggested in the workshop guidelines: The moderators chose to combine steps 3 and 5 (choose and rank criteria). This eliminated the possible confusion that could be caused by dealing with criteria twice.

How was the interest and participation of the different stakeholder groups in the Workshop?

As stated earlier participants were very active and showed great enthusiasm for the project. There is great expectation that the exposure gained from the project will lead to developments which will alleviate environmental problems but also provide alternatives to farming as a source livelihood. It is worth noting that, the number one choice for stakeholders was game ranching. The steep financial demands meant it had to be put on hold – the locals still want it pursued, with funds sought elsewhere to make this a reality. Their feeling is that it is the best option by far and it would offer the much needed diversification to their livelihoods. Another issue of interest is desalination – the area has salty water mainly, and locals indicated the need for a workshop where the desalination technologies, their costs and operational efficiencies would be presented.

Recommendations:

The DESIRE Project should provide seed money for the implementation of the pilot biogas production project. Community members are enthusiastic but poor (see comment below).

Comments: So far the DESIRE project is going well and community members/land users like it and are eager to participate in the next step – piloting. However for the Botswana study site this stage is threatened by lack of funds. The main problem is that the land users themselves have no financial capacity to implement. The only hope for implementation is donor funding which may either or not be forthcoming; or not coming quick enough for the project schedule.

Comment CDE: Is there no room of manoeuvre for providing seed money from the DESIRE budget?

Answer SST: We plan to request Alterra to allow us vire funds within our budget towards piloting. We shall count on your support.