

BarotseLand.com, Mongu, Zambia **Zambezi Valley Development Initiative (ZVDI)**

in association with ENDA Tiers Monde, Dakar, and Stockholm Environment Institute (SEI), Oxford, UK and United Nations Institute for Training and Research (UNITAR)

Lyambai Vulnerability and Adaptation Project **Stage 2**

Community based adaptation to climate change (CBA)

Kalabo District West, Western Zambia – Zambia-Angola frontier region
Lukena, Siluwe, Nyengo, Sikongo

FIRST FIELD EXPEDITION 20-31 October 2010: Report (second draft)

Geographical context (trans-frontier zone)

The four pilot action villages are located in Kalabo District in the farthest western reaches of Western Province, Zambia, abutting the border with south eastern Angola (see Figures 1 and 2). Across this border, due to a lack of policing, goods, people, vehicles and animals pass freely. The physical border itself is hardly noticeable except by occasional stone pillars and a slight undulation in the landscape where, presumably during colonial times, a narrow trench was dug.

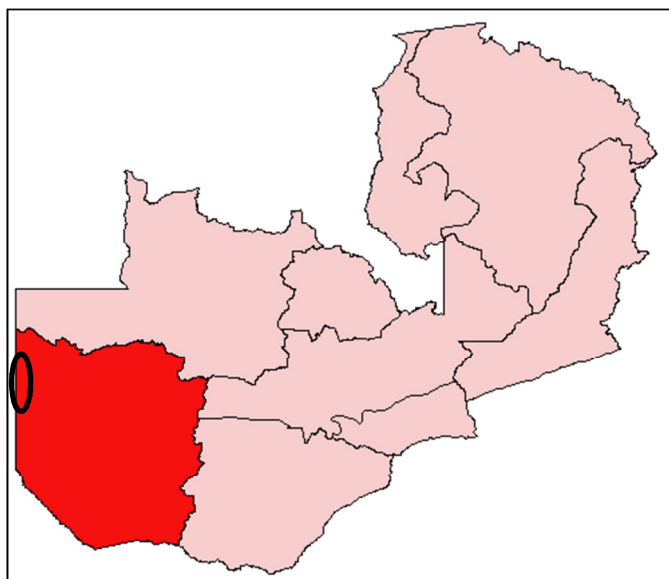


Figure 1 Western Province Zambia shaded in red with field expedition zone marked by black oval

The life of the region is dominated by the river system which is part of the Upper Zambezi basin, in particular the attributes Luanginga and Lueti that rise in Angola and bring large quantities of water to the main Zambezi channel between December and April, plus the annual inundation of what is a giant plain and phreatic store. During the field trip, which was conducted at the driest time of the year, these rivers, together with saturated land in adjacent riparian zones were discovered to be a controlling influence over communications and productive activity.

Policing of the border is difficult. The area is an ex-conflict zone, a 35 year civil war in Angola only having ended in 2001. Guns and other munitions are traded very cheaply for food particularly and money (during the field work a quotation of \$15 was received for an AK 47 assault rifle). At the present time ammunition is in less plentiful supply following a period of high local crime committed by local youths and ex-fighters. Land mines on the Angola side of the border are a constant menace. Policing is constrained by lack of infrastructure and resources in both countries, by inaccessibility to many sections and by the sheer length of the border (1170km). Most resources are concentrated on strategic roads and tracks and it is significant that the Kalabo-Sikongo-Angola border road is to be upgraded using external loans in a 3 year project that aims to create a segment in a new east coast-west coast road across southern central Africa. This will have considerable impacts socio-economically on the region which has hitherto felt a sense of isolation from the rest of the world.

Local communities are not statically contained within a prescribed space on one side of the border. Rather, they live fluidly on both sides of the border. Culture such as belief system and language are identical. Economic systems such as livestock rearing and grazing are carried out across the border although the very few services provided by government on the Zambia side such as vaccination of livestock, are complicated by this free flow of animals and people.



Figure 2 Google Earth image of field expedition area showing Mongu (Provincial capital), Kalabo and the four pilot action sites. Luanginga River and extension to Upper Zambezi floodplain is shown in dark green between Kalabo and Siluwe while Lueti flows between Luanginga at Kalabo and Sikongo.

Local people, particularly in Lukena, Siluwe and Nyengo, feel that they are seriously neglected in terms of communications, economic development and social welfare support. There is no electricity and precious other form of energy generation. The area lies approximately 750 km west of the capital Lusaka. What tracks there are become impassable during the flood season which can last from December thru to June depending. People reported that floods in recent years arrive at a faster pace, are deeper, and result in more damage to infrastructure, and loss of crops that get drowned causing local food shortages that go unreported due to poor communications networks. In addition, such floods inundate wells and pit latrines situated on land previously thought impregnable to flooding. This pollutes the water which is still used for all purposes leading to health hazards.

Problems with agriculture were universally reported as was food insecurity. People complained that onset of rainy season was taking place now in late October or November when it used to be September. Much was also made of extreme weather such as excess heat and harsh sun that dried seedlings after germination and the soil they were growing in as the rainy season went appears to be becoming intermittent. Rice and maize were singled out as the most difficult crops due to climate variability, maize as a result of not being drought or flood resistant and rice due to drowning of crops for excess periods during deep floods.

Health problems are also reported to be on the increase. People admired how some on the team (including the writer) looked older than most of their number. 'People here do not get old any more' remarked a young woman. We have no medicines and the traditional remedies of old do not seem to work any more and we have lost the knowledge to apply them.' Indeed it was a fact that there seemed to be almost no old people at the community meetings held during the field expedition. Specific diseases mentioned were malaria, diarrhoea and dysentery and HIV-AIDS. It was obvious that there are few medical facilities. One clinic at Lukena was inhabited by some local men and looked not to have much in the way of medical supplies. On the issue of HIV in particular, people speak of what they have heard to be a serious problem exacerbated by low knowledge, mobile populations (especially cross-border and to other regions in search of paid work), poor nutrition and lack of appropriate testing, analysis and anti-retroviral drugs for those positive. The position may well be far worse than that reported in official statistics. The problem with HIV in these parts is that, like climate change, HIV is a background condition which is not readily identifiable and therefore, without testing and treatment, a hidden killer, as people die

quickly of malaria and other diseases that were not so fatal in the past as people built up natural resistance.

Method of canvassing local views and eliciting information

In each location, large numbers of people arrived to greet the field research team and due to numbers and to give fair chance for expression, people were divided into groups. These groups reflected: seniority, gender, and age.

As the field visit logistics were coordinated locally by the Seventh Day Adventist Church (SDA), a speech of introduction was provided at each location by the Regional Pastor of the SDA, Maxwell Muvwimi introducing the visiting team. Then, the leader of the project work from ENDA, Lawrence Flint, spoke to the assembled crowds, explaining the purpose of the visit, who were the organisations involved in the work and the background to the Zambezi Valley Development Initiative (ZVDI) and then asking the permission of the community first to engage in questioning to ascertain the charges that have been taking place in weather and climate and the impacts these were having on lives and livelihoods and, secondly, to consider the implementation of an adaptation training centre in their community.

Gatherings were then split into groups moderated by members of the Barotseland.com team. These meetings were highly participated in by the communities concerned and a tremendous amount of anxiety was raised in areas that were only tangential to climate, reflecting the deep feelings of neglect and isolation felt by the communities. Questioning followed a regular pattern mediated but not forcibly dominated by the questionnaire in Appendix 1.

Field visit report and feedback from question and answer sessions in summary



Figure 2 Deep sand approach to pontoon over Zambezi near Kalabo. This 'road' is the main route from Kalabo district to the rest of the country and elsewhere and provides an immediate explanation for the isolation experienced by the pilot action communities



Figure 3 Exposed sand layer - village on track to Lukena. With increasing populations often comprising immigrant peoples who have little knowledge of the local ecosystem, valuable soil layers and woodland cover are under constant threat. Kalahari sand is very close to the surface.



Figure 4 Field research team en-route Lukena-Siluwe by only transport available via canal crossing fast flowing Luanginga River carrying water from Angolan highlands. This land forms one arm of the giant Upper Zambezi floodplain that may once have been a great lake and still resembles one for up to 6 months of each year

Climate hazards

- *Rainfall pattern has changed, has become less predictable: "...when you expect rain – no rain; when you don't need a lot of rain, that's when there is more rain". One report claimed that 1991-1998 was time of little rain, 1999-2009 of considerable rain*
 - *Intermittent severe droughts*
 - *Becoming hotter ("too hot") than in previous years especially during 'summer season' – heat was cited as a particularly noticeable 'change' as opposed to variability.*
 - *..."the rate of change is more than previously, every year there is a change in climate."*
 - *Weather seems to move from extreme to extreme – severe heat and searing sunlight to storms and floods (which do not emanate from local rainfall so are much harder to predict due to lack of advance warning).*
 - *Floods used to appear in January but now often appear ("start") in December*
 - *Strong winds, particularly in dry season, seem to blow from any direction*

Impacts

Livelihoods

- *Unpredictable rainfall leading to difficulties in calculating when to sow and what to expect*
- *Heavy rains destroying crops and washing the nutrients from the soil*
- *Floods carrying away crops and ruining – root crops and even rice which cannot be drowned for more than 3 weeks*
- *Deep floods eating up the flood season grazing for cattle*
- *Trees caught up in high floods have stopped bearing fruit*
- *Shorter growing period*
- *After the floods, the land dries very fast, moisture drains away and the land is desiccated by high winds, searing sun and, later in the dry season, excessive heat.*
- *More pests than previously, eating crops*
- *Poor harvests*
- *Crop failure – realisation that "rain is not for farming (rain-fed agriculture) but just for the sake of raising"*
- *Cassava reported to be affected as most varieties do not like moist conditions therefore only grown in Mushitu (forest) where soil is poor (sand)*
- *Millet and other seeds not germinating "due to hotness of soil"*
- *Loss of emergency food sources – "...even our natural fruits are being damaged by a lot of heat..." "Our natural fruits are being damaged by drought; our natural fruits are our drought fruits but these days there are less fruit than before."*
- *The keeping of cattle has reduced considerably and has ceased*



Figure 5 Elders and Indunas at community meeting Siluwe. People commented on how few old people they had in their communities and how diseases were now wiping out more and more people in their 20s and 30s with no drugs or medicines available



Figure 6 Woman and her children in field near Lukena. Young children have to look after babies while their mothers toil. Children are receiving less education than in the past due to inability to pay school fees. People say this is because household finances hit by poor harvests.



Figure 7 Women's group at Siluwe; women spoke about how gender roles are changing as men seem no longer able to fulfil their traditional roles as providers for their families. More women headed households but reduced mobility and access to land make it harder for women to support families.

altogether in many cases due to poor grazing, less plains grass following excess flooding and hot dry conditions (extreme to extreme)

- Cattle are getting diseases in and from Angola where veterinary services such as inoculation are practically non-existent. Mention of scabies and anthrax
- Reduced milk yields from cows
- Do not receive agricultural advice (Lukena/Siluwe in particular) despite government promises
- Government comes just when it is election time
- Do not receive fertiliser
- "these days we depend on selling grass and making traditional roofs"
- Declining soil quality when the rains are heavier (washing away of topsoil which is very thin in the plain, quickly revealing Kalahari sandbelt underneath) – "due to poor soil we do not harvest enough food for our families"
- Prolonged deep floods arresting fishing (fish tend to stay near in the depths plus danger of canoeing in deep, fast moving water
- Declining fish catches leading to contravention of traditional codes such as not taking small fish. "Some people use 'Sefa-sefa'. Collects even small fishes so now we have small catches." "We need fish farming"
- Rivers are becoming shallower (maybe in the dry season)
- Less wild animals and opportunities for bush meat
- Lack of markets to sell food – connected to major complaint about poor communications – no roads, radio, telephones (landline of mobile network), even when surplus rice is grown there is problem of getting it to market due to poor road and only transport is ox-drawn scotch carts. This problem also connected to never seeing food relief during times of hunger
- Populations are increasing in spite of some migration, for example, to Kaoma district

Livelihood perceptions

- Feeling of helplessness due to uncertainties – "we are surprised, what is causing all these problems? Something beyond our control, we really don't know what we can do"
- "We have lost the knowledge of farming – we need to be skilled"
- Frequent expressions of need for and enthusiasm to receive help from outside – inputs, information, skills, technologies
- Insufficient inputs from governance bodies
- In the past food security was assured in unison across Angola-Zambia border and by trading with North-western Province (an area that used to be known as Balovale) for cassava, now this balance has broken down due to serious reduction in food production in latter years of civil war ended 2001, not replaced



Figure 8 Addressing community gathering at Siluwe - note use of English-Silozi interpreter. In fact most of the community are Makoma, one of the many sub-groups of the Lozi, with their own language Simakoma closely aligned to Simbunda. This may have been a barrier to communication



Figure 9 Church packed with young people curious to hear the messages of the field visit and anxious to express their own knowledge and frustrations about climate, lives and livelihoods



Figure 10 Women at Nyengo responding to questions posed by female members of field research team - united by religious culture - blue and white costumes. Religion is one constant in a seeming world of constant change and exigency.

due to landmines and loss of labour

- Perception that environmental change is as a result of 'misusing nature'
 - Excess burning of bush and grasses and cutting down trees is stopping rains from coming

Lives and Health

- Noticeable change in flora and fauna – loss of natural fruits – 'drought foods'
- Climate change affecting the animals in the Liuwa Plains National Park that now come nearer to people and villages in search of food and water but we are told not to kill the animals from the park
- Increasing hunger. Have to rely on emergency food sent from Mongu by very unreliable transport
- Excessive heat drying up rivers in dry season causing shortages of water
- Noticeable increase in human mortality due to heat stress
- Increased prevalence of physical health problems
 - Droughts and floods are bringing more diseases
 - More mosquitoes and malaria
 - "pulamulwe" (this was mentioned several times and explained as a disease characterised by severe headaches affecting adults and children suspected locally to be caused by too much exposure to sun and heat). Prevalence of this condition has contributed to decisions of some communities to shift village sites
 - AIDS
 - Diarrhoea, dysentery
 - Children coughing more and getting more lung complaints
 - Dental problems
 - Bodily aches and pains caused by having to carry heavy loads to and from Kalabo (here reflecting deteriorating and disappearing tracks and difficulties of transport by canoe due to problems with flooding of land and rivers)
 - Increasing incidence of barren men
 - high blood pressure
 - Tuberculosis
 - Increased mortality ("because of hunger" suggesting increased food insecurity)
 - Lower life expectancy
- Increased mental health problems
 - stress levels caused by failure of farming and ability to feed families and manage homes
 - lower morale resulting from above and feeling of being abandoned by governance and ignored by NGO



Figure 11 Track between Kalabo and Lukena. In forests and woodland, these 'roads' are more distinct and tend to eat up less of the land whereas in the open plain, tracks can be up to half a kilometre wide as vehicles seek to avoid soft sand exposed by predecessors



Figure 12 Rehabilitated Barotse 'sleigh' drawn by oxen and used for light haulage through sands where wheeled vehicles cannot pass –south of Lukena. In the past, local people were noted by explorers, missionaries and colonial officials for their ingenuity and innovation



Figure 13 Armed Zambian immigration officer from Sikongo treads warily in border village; security is an ever present challenge in this border region where a 35-year civil war in Angola only recently drew to a close

community

- Excess floods have stopped people from being able to visit their friends and relatives (depth and speed of water considered too dangerous)

Lives and health perceptions

- Deep concerns expressed regarding poor communications – no roads nor communication technology, particular stress on lack of network for mobile phones also no reception of local radio stations
- Idea often expressed that exigencies described and lack of obvious explanations are connected to imminent “end of the world”
- There are more diseases and they are more virulent than in the past

Gender roles

- Roles of women and men are undergoing change
 - Women “...don’t catch fish, they no longer go for fishing”
 - Women “...don’t manage cattle”
 - Women “...are no longer building houses” (men have always constructed outer frames)
 - Women increasingly taking responsibility for “taking care of the home”
 - Women now plough
 - Women perceive their role vis-à-vis men differently – “Women are very strong and reliable, when we compare a house for an unmarried woman, it differs from an unmarried man; a woman can manage everything in a house”
 - Women now paddle (canoes – previously a male preserve and skill)
 - Women walking longer distances for basic needs
 - Men no longer planting crops such as sweet potato
 - Men no longer making traditional mats
 - “These days you find men and women doing same jobs in the house”
 - “Women have no privilege for land ownership or village headship; only men have this privilege. A woman can own land but she will be grabbed. According to our tradition a man is more responsible than a woman.”
 - Women cannot travel long distances – because of tradition
 - “Because of marriage issues, women are not dependable, that’s why land ownership is not given to them



Figure 14 Zambia Angola border - slight undulation dug in colonial times



Figure 15 Zambia-Angola border - a narrow gap cut into woodland 22.5 km of Sikongo. The border is very porous with easy movement of people, goods, animals, weapons, criminals and less tangible things such as disease, and poverty



Figure 16 Field research team joining other local people on ponton across Luanginga River at Kalabo. This rope pulled pontoon is the only (fragile!) crossing point for vehicles into the Liuwa floodplain and park. All other transport has to be undertaken by canoe (3½ days to Lukena) or on foot. The track to Lukena is impassable due to floodwater for several months and unusable except by the strongest 4x4 at other times (distance 105 km time 7 hours

- *Women who are not married are struggling "...because they do not have men who can assist them for example with money to pay to people who can help them" (always assuming that men have access to money!)"*
- *"We are really challenged by this climate change and its impacts. That's why the roles of women have changed; women, now they look for food in the house"*
- *Increasing abuse of women*

- *Youth comments and perceptions*

- *Our parents don't grow crops any more*
- *Due to floods there is high poverty in our area*
- *"We don't practice fishing anymore and we are dying of starvation"*
- *"We cannot buy most things"*
- *Strong winds are destroying homes and blowing away pollens from crops*
- *"Refugees (from Angola) steal our parents' cattle"*
- *"Nothing will stop us from staying where our forefathers left us."*
- *"We want to be in town because there is no network here!!"*
- *"We are ready to face anything. We speak Simakoma and are very proud of our tribe"*
- *"no need to run away from this land because it is us who have destroyed our nature"*
- *"nobody is going to bring development to this area"*

- *Education is being put off as heads of households are unable to afford the fees as they put food security first following poor harvests, thus children are not sent to school.*

Overall perceptions

- *Feeling of isolation, "...nobody comes from the towns to us as they want to get back in one day. Our roads are too bad, there are no people who come to help us."*
- *Vulnerability has increased affecting everyone in communities*
- *Paucity of explanations for changes in climate and negative impacts*
- *Enthusiasm for genuine inputs from outside, expressed everywhere – communities that have been used to isolation are anxious for new method and systems that they can manage themselves. Readiness to pursue new livelihood ideas*
- *In general people do not want to leave this land despite the hardships*
- *Low morale*
- *These changes are coming about because the world is in its last days, also God is coming*
- *Older people can recall specific years of devastating flood or drought and ascribe these to climate change (yet there have always, through history been records of years of extreme climate)*
- *In the past any help has not been negotiated with local Indunas and has usually been insignificant or inappropriate*

Synthesis

Climate hazard context

To summarise the comments made by local people:

- Rainfall appears to start later, is less in volume, intermittent and is also characterised by heavy storm events.
- There is a perceived increase in temperatures and particularly, extremes of heat accompanied by extreme sunlight.
- Winds appear to have increased in velocity and are unpredictable in nature
- In general, there is increased variability and an increasing dynamic of change

The first observation to make is that this region has always known extremes of climate and climate impacts, in particular floods and droughts. Explorers and missionaries such as Livingstone (1857), Holub (1875) and Coillard (1897) wrote about such extremes and the exigencies that people suffered during these times and how people would say that a particular flood or drought event was the worst in living memory. This is not to downplay the changes that are taking place to the climate today and the way that the system appears to be failing to bounce back after being hit by extreme climate impact shocks. One question to be answered is whether the variations and changes in climate reported are actually any more acute than has occurred in the past. If not, then what are the explanations for changes to the SES and how does this help to devise adaptation strategies?

The climate problems that people refer to may seem contradictory – less rain, heavier floods certainly contribute to people’s sense of confusion but do have some rational explanations. On the one hand farmers and other local people speak of onsets that do not come ‘on time’, stop and start and appear to deliver less rain except in extreme storms which are on the increase. Meanwhile, these same people speak of higher and deeper annual inundations across the floodplain where they live and of water that remains longer causing the damage described. In fact, total annual rainfall has varied very little over the last century (Flint 2006: 10) while there are clear inter-decadal peaks and troughs corresponding to droughts and floods.

All the pilot action villages in this study lie on the western margin of the Luanginga River floodplain or, in the case of Sikongo, close to its tributary the Lueti. During the rainy season, which extends roughly from October to April, water permeates through the narrow soil layer into the deep Kalahari sand layer common to this region that acts as a phreatic zone saturating the ground i.e. raising the water table, often to the surface. However, it is not the rainfall or run-off in the region of the floodplain that causes or controls the annual flood. This is brought about by water that travels down the Luanginga River from the Central Angolan highlands that form the western watershed boundary of the Upper Zambezi basin.

Causality for many of the changes testified to in the field research can be located in anthropogenic processes, some far away upstream of the Luanginga-Lueti River system in the Central Angolan highlands. Since the end of the Angolan Civil War in 2001, extensive clearance of forest and other vegetation on the slopes of the watershed area in order for agriculture to commence. The result of this clearance, as in other highland areas of the world with steep slopes, is that run-off into channels from rain events increases, often dramatically and this causes stream flow to augment both in volume and velocity, hence the reports of floods arriving suddenly, early, at great speed and to great depth in the floodplain areas of the Luanginga whose floodplain is not very wide in comparison to the larger Buluzi floodplain into which it empties. In these areas, local rainfall in November (despite the later onset reported) and December has managed to raise the water table so that the great volume of water that rushes from the Angolan highlands, over-spilling the banks of the Luanginga and Lueti, then speeds across the land as if on a skating rink, reaching parts that were not reached before, hence the surprise that land used for cultivation and grazing in the flood season in the past now get inundated.

Similarly, because the water from rainfall in the watershed areas arrives at greater speed and volume, and because the total precipitation is either less or little changed but appears to be taking place in a shorter rainy season (later onset), flood recession, once it commences, also takes place much faster than previously, there is not a drawn out gradual transition from aquatic to terrestrial state. Therefore the littoral of receding water, which in the past was slow, allowing considerable production of biota, now moves faster, taking with it some much of the nutrient giving silt to deposit downstream.

It is said that a river's chemistry reflects the properties of the catchment area and that this mediates the nutrient budget of the river downstream and the fertility of silt deposited in the floodplain (Hyens 1975, Vannote et al 1980). A floodplain receives all cases of nutrient directly from overspill from the main channel (Junk 1989). Similarly, because of faster run-off in the watershed zone, water that enters the channel has not had time to pick up nutrient-rich silt to deposit as sediment in the floodplains and delta downstream. This may provide part explanations for some of the reports of reduced soil quality

Many issues were brought up by local community members that have nothing to do with or are merely tangential to climate or environmental change. These issues have much to do with local, national and transnational politics and social economies.

Introduction of Sikongo Adaptation Centre

Each community was canvassed, through its leaders and via community meetings as to the willingness to host an adaptation training centre in their communities. All four communities

showed enthusiastic interest and one – Sikongo – immediately offered land for this purpose and asked for its inauguration as soon as possible. Given the limitation of resources, the difficulty of access from December to June of the other three communities, the time limitations of the C3D project, and the immediate offer of land by Indunas at Sikongo, it was decided to pursue one adaptation training centre at Sikongo in the 2010-11 fiscal period. There is a poor but usable piste available from Kalabo to Sikongo (58-60km) once the main floodplain has been crossed (by river transport in flood season) from Mongu to Kalabo (70km depending on route).

The adaptation training centre at Sikongo will go live in early 2011 and consist of a piece of land donated by the community through local Chief and Indunas attached to the Barotse Royal Establishment which controls land use in the region and is a partner in the community-based organisation implicated in this action. This piece of land will be at least 2/3 hectares in extent and will have a management building erected upon it. The Adaptation Centre will be guarded.

The purpose of the centre is to introduce new knowledge, methodologies, techniques, skills and technologies and train local people to manage these in order to showcase to the local community. Individuals or groups will be trained to use new tools, methods and approaches before being implemented for livelihood production proper.

The objective is to reduce and spread the risk attached to climate change and other impacts on the socio-ecological system that are negatively affecting lives and livelihoods in the area over time and space. It is also to improve risk management by increasing the local knowledge budget on climate and other biophysical and socio-economic dynamics and developing a pool of potential adaptation responses. A further objective of the centre is to become a local 'climate observatory'. This latter aspect involves recording of climate and climate impact data and provision of information from Kalabo-Mongu in return.

Principles of Adaptation Centre:

- Supported by community leaders
- Increase local knowledge budget and sharing
- Promote connectivity between agencies of governance, research, and private sector
- Locally owned and managed
- Showcase for new methods, skills and alternative practices
- Invested in by government extension bodies, NGOs and other external bodies or training of local people to manage new and alternative practices
- Open access to all members of local community
- Focussed on sustainable climate-resilient livelihoods
- Must become part of region-wide effort to enhance resilience supported by government and traditional authorities.

During the second field visit of the current project, scheduled to take place in February 2011, the Sikongo Adaptation Centre will be confirmed, land and local personnel identified. Commitments will also be obtained from government departments in Kalabo to supply the Adaptation Centre with knowledge, tools, methods and approached including alternative livelihood practices such as fish ponds, small livestock keeping and new crop varieties that take account of some of the exigencies reported in this document by community members.

It is envisaged that the Sikongo Adaptation Centre will become operational during the dry season June –December 2011

Summary outputs of action

1. Risk communication on climate change, hazards and impacts in the field during Interaction with and awareness raising with 4 communities on Zambia side of Zambia-Angola border
2. Narrative on vulnerability and resilience in case study area
3. Workshop on risk communications and management for knowledge holders, government officers and other community leaders
4. Introduction of concept of Adaptation (Training) Centre including implementation of first centre at Sikongo

Lessons learned during field expedition

1. Difficulties of maintaining communications with pilot action sites isolated from communications infrastructure such as cell networks, roads, radio/tv
2. Dynamic flow of socio-ecological processes unique to border/frontier zones that offer unstable and unequal risk scenarios.
3. Importance of treating trans-border ecosystems equally in research and practical action
4. Difficulty of communicating risk in a socio-ecological zone where the causes of environmental change lie outside of that zone