



**HLLM Model:
Restoring degraded rangelands in arid and
semi-arid ecosystems**



**NJEREMOTO BIODIVERSITY
INSTITUTE**

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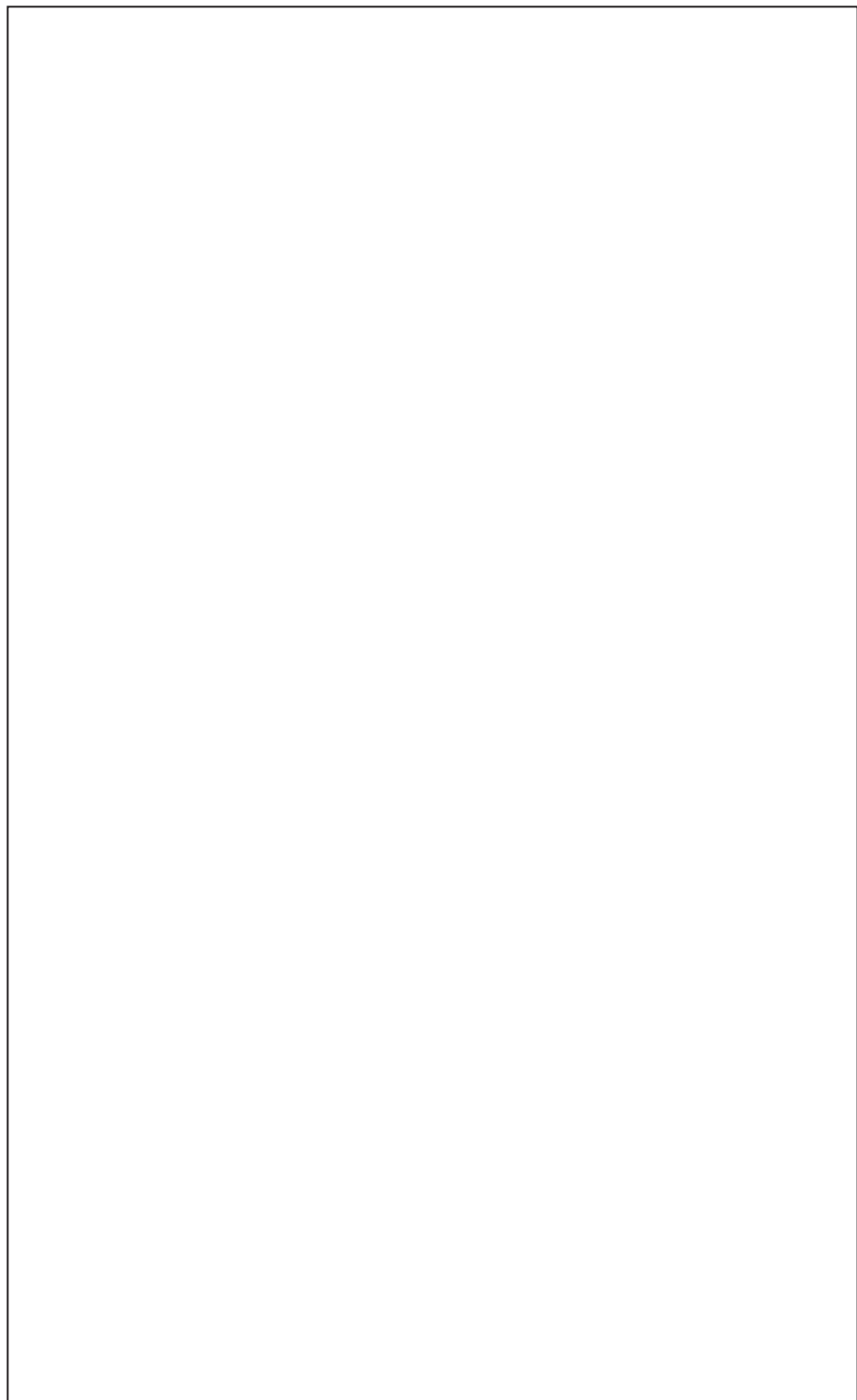
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DEDICATION

This book is a result of our passion for reducing effects of climate change and improving livelihood in rural ecologies





NJEREMOTO BIODIVERSITY INSTITUTE



A Tudor Trust Grant Recipient

Websites

NBI: <http://njeremotobiodivers.wixsite.com/njeremotoinstitute>,

NBF: <http://www.nonprofitfacts.com/DC/Njeremoto-Biodiversity-Fund.html>

VISION

Empower smallholder rural communities in arid and semi-arid rangelands of Zimbabwe, SADC region, Africa and globally, managing their lives and resources holistically to improve their quality of life and that of future generations

MISSION

To support the vision, we: work collaboratively in strengthening sustainable development of arid and semi-arid rangelands in Zimbabwe, SADC region, Africa and globally; create wealthy communities with sustainable livelihoods; rehabilitate, regenerate; restore degraded arid and semi-arid rangeland ecosystems; and develop self-reliant, self-regulating and motivated communities.

CORE VALUES

Integrity
Empowerment
Results Focus
Participation
Sustainability



NBI PRINCIPLES

- a. Bring back nature: Enhancing the health of the ecosystems and respect of nature for sustainable livelihoods.
- b. Always promoting and improving effective teamwork in our work.
- c. Accountable and Transparent: Seeing and conveying things as they really are
- d. Innovative and Creative: Keep searching for and trying out new ways of doing things.
- e. M&E: Continually checking progress, reflecting and learning from our experiences
- f. Research and Documentation: Ensure a variety of evidence to illustrate the impact of our work



3.0

Holistic Land and Livestock Management (HLLM) sees blooming savannah grasslands in Zimbabwe and all arid and semi-arid rangelands of the world.”

Osmond Mugweni

DEFINITION OF TERMS

The following are popular terms used by NBI.

NJEREMOTO BIODIVERSITY INSTITUTE:

- NJEREMOTO: Gold represent Wealthy Communities
- BIODIVERSITY: Green symbolises Healthy Sustainable livelihoods
- INSTITUTE: Blue is for Abundant Clean water (surface and Underground)
- Njere: Wisdom: Ecological Indigenous and scientific Wisdom
- Moto: Is fire. It symbolises knowledge that is passed on like fire and kept burning



"In my Shona culture and belief system, the land evolved with herding grazers. Absence of one result in destruction or extinction of the other"



ACRONYMS

NBI: Njeremoto Biodiversity Institute; Zimbabwe

NBF: Njeremoto Biodiversity Fund, Washington DC USA

HLLM: Holistic Land and Livestock Management

VIDCO: Village Development Committee Area



“Growing up in traditional Shona woodlands, biodiversity was the norm. I am saddened seeing the demise of the ecosystem in arid and semi-arid rangeland ecosystems due to land degradation.”

Osmond Mugweni



BRIEF BACKGROUND OF NJEREMOTO BIODIVERSITY INSTITUTE



NBI is mandated to facilitate implementation of Holistic Land and Livestock Management (HLLM) through **Sustainable Time Controlled Grazing in Arid and Semi-arid Rangeland Ecosystems**. HLLM is designed for Smallholder Rural Communities, in Zimbabwe, SADC Region, Africa and globally. HLLM aims to manage the livelihoods and resources of communities holistically in order to improve lives for current and future generations.

Njeremoto Biodiversity Institute's establishment was very gradual and self-funded. The first steps focused on establishing its home-base as a working example of the benefits of planned grazing

In NBI-Zimbabwe was established and registered on 11th November 2004 in Zimbabwe as a Trust; MA 1434/2004, amended 24 April 2015 by current Registration No MA 531/2015. as a non-profit organization.

In June 2009, NBI was also registered as Njeremoto Biodiversity Fund (NBF) in Washington DC, USA, a not-for-profit 501 (c)(3) organization, with **DLN: 17053170025049 and Public Charity Status: 170(b)(1)(A)**. NBF is a fund raiser for NBI-Zimbabwe.

In 2013, NBI received financial support – **The Tudor Trust Grant**, to start implementing the **Holistic Land and Livestock Management (HLLM)**. The project work with communities in Ward 5 Shurugwi. Ward 5 Shurugwi, is NBI's pilot community project.

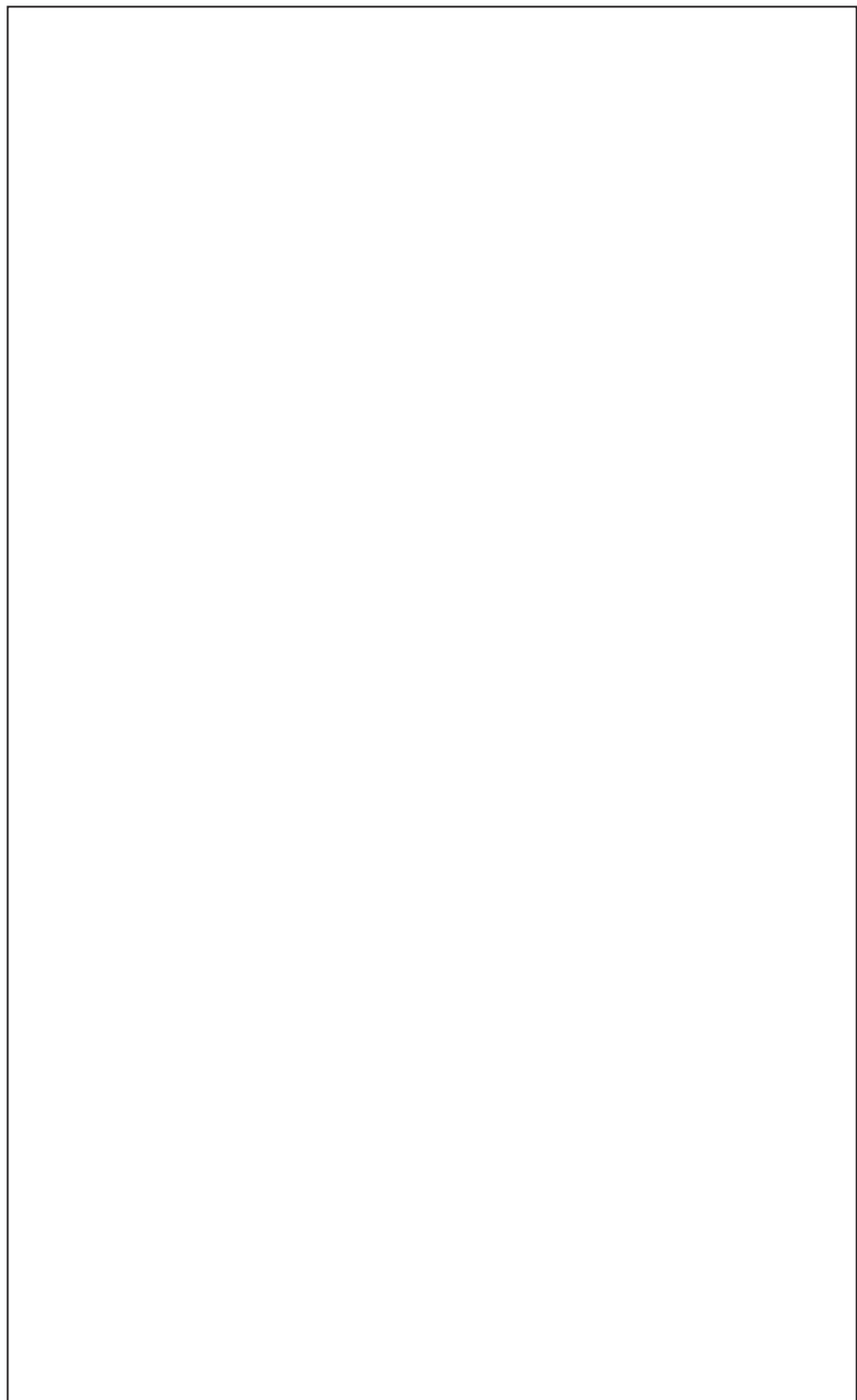
From 2 - 6 December 2013 NBI with Wards 5 Shurugwi, project participants undertook a look and learn visit to Africa Centre for Holistic Management and Sisinda – Hwange Community, in Victoria Falls (2nd to 6th December 2013)

From 28 June – 3 July 2015, NBI and the Ward 5 Shurugwi HLLM project participants visited the Rundu Conservation Agriculture Project in Namibia as the Institute's awareness raising.

NBI now has a firm footing in Ward 5 Shurugwi and the community has developed understanding of HLLM from the awareness raising work of NBI in planned grazing.

NBI has a responsibility to develop skilled communities who can address local and global rangeland challenges. We contribute towards creating successful and thriving communities who produce value added goods and services.





NBI BOARD OF TRUSTEES



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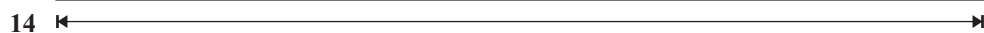
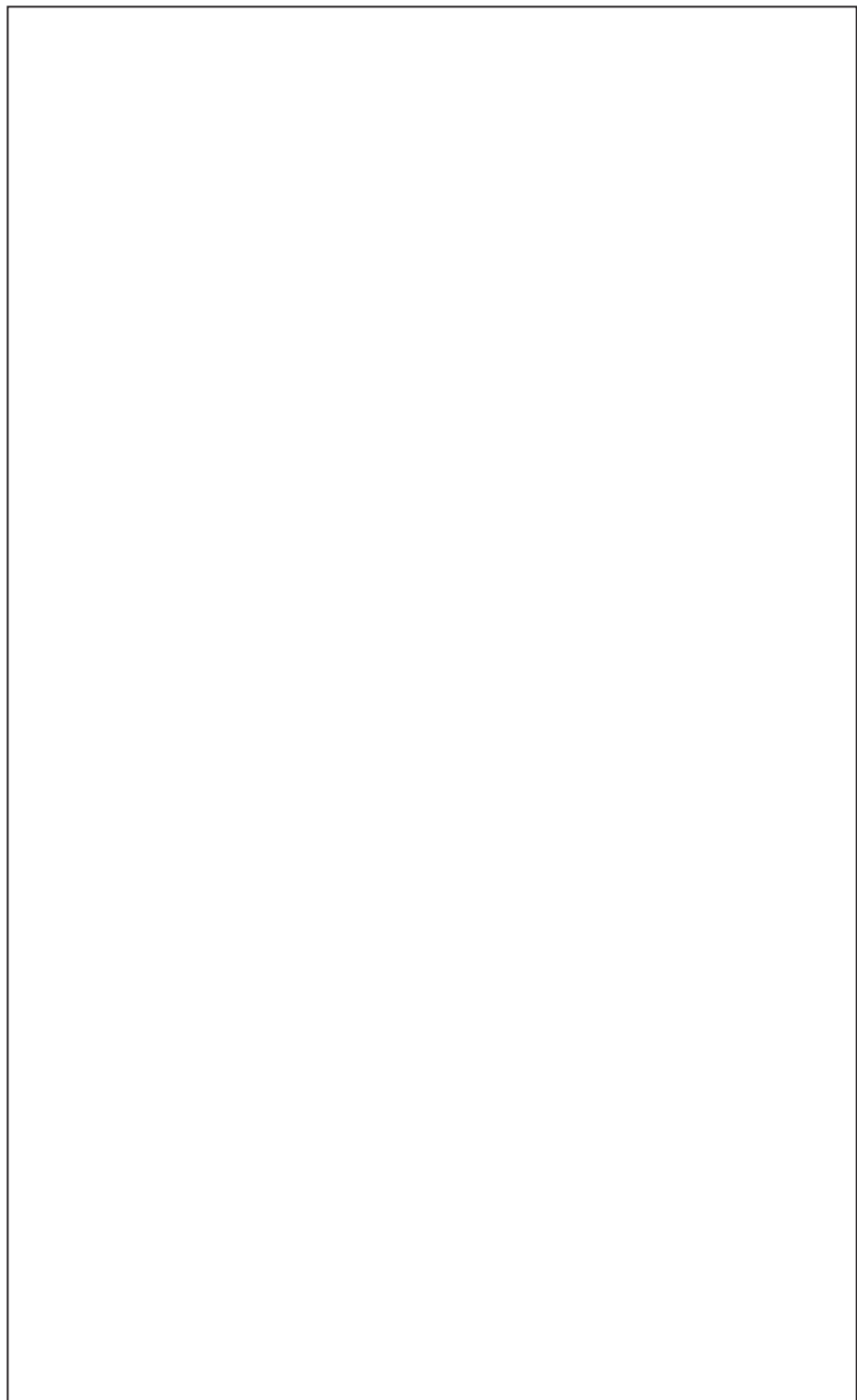


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CAPACITY BUILDING





14

NBI BOARD OF TRUSTEES



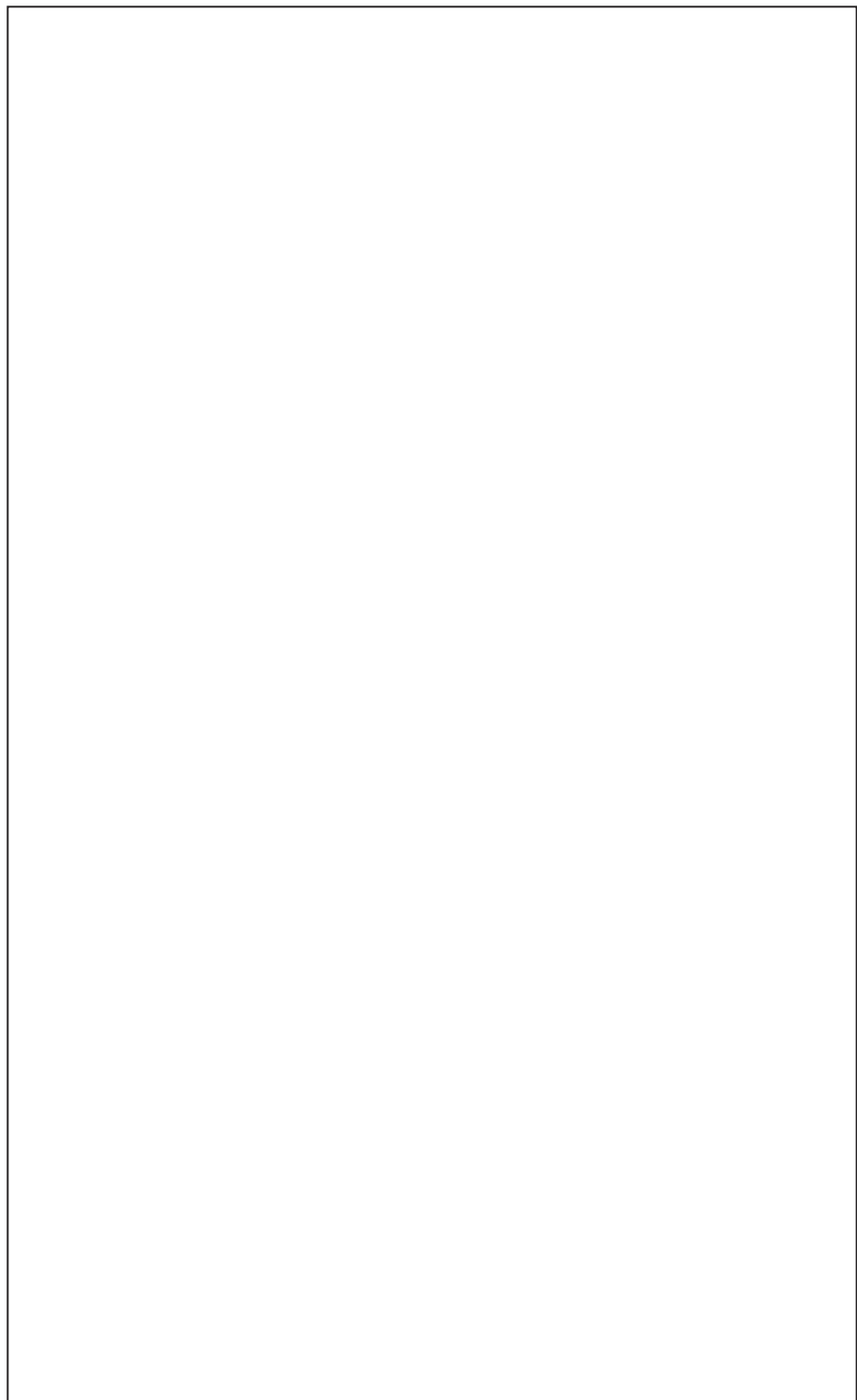
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THE HLLM PROJECT



Njeremoto Biodiversity Institute runs outreach programmes. Presented in this document is the Ward 5, Mufiri, Shurugwi District. The is funded by the Tudor Trust Grant since 2013.

Project Title

Njeremoto Biodiversity Institute Community Outreach PROGRAMME: for Holistic Land and Livestock Management (HLLM): Ward 5 Mufiri, Shurugwi District: Midlands Province

Project Location

Ward 5: Mufiri, Tongogara Rural District Council (RDC): Shurugwi Rural District: Midlands Province: Zimbabwe

Project Timeframe

01 May 2013 to 30 June 2018

Participants

One thousand and six (1006) households with and without cattle in 5 Village Development Community Areas (VIDCO).

HLLM Project Objectives

The holistic land and livestock management project objectives are clustered under three headings:

Land management, Livestock production, and Community engagement

Land Management

- 1.1 Rehabilitate degraded rangelands and restore healthy grasslands for increased fodder.
- 1.2 Recharge underground water to restore natural water sources and provide drinking water.

1.3 Combat effects of climate change and reverse desertification.

Livestock Production

2.1 Develop livestock management plans, increase herd productivity facilitate herding and reduce stock losses.

2.2 Create markets for livestock and develop Community Agro-processing focusing on Abattoirs and Milk Centers.

Community Engagement

1. Develop farmers' eco-literacy, transfer of knowledge and management skills.
2. Develop self-reliant, motivated, action oriented and cohesive communities.
3. Enhance food and nutrition security, increase income, and eliminate poverty and hunger for sustainable livelihoods.
4. Attract investment, create employment and attain rural economic growth.
5. Encourage eco and cultural tourism. Main activities



Rejuvenated grasslands reversing moribund species

Brief Background

The HLLM project evolving at the Njeremoto Biodiversity is demonstrating the Indigenous Shona Knowledge on Grazing and Land Management. In the Shona culture, the land evolved with herding animals. Hence the absence of one result in the destruction of the other.

The conventional grazing management belief that too many animals result in overgrazing is a misconception of the semi-arid savanna environments of Southern Africa where these environments evolved with thousands of herding grazers such as wildebeests and buffalo. The Shona believe that overgrazing is caused by inadequate recovery period for grazed plants. Further, they believe that in conventional western grazing management practice, overgrazing is a result of domesticated animals overstaying on the same piece of land (continuous grazing) or returning too soon to the grazed area (rapid rotational grazing systems).

Opportunity existed on vast areas of degraded land to utilize animals (domestic and wildlife) to heal the land, improve water cycles and build biodiversity, while enhancing food security, reducing poverty, and establish ecological stability at a landscape scale hence positively changing peoples' life.



Silted Rivers Common in arid and Semi-arid ecosystems with current management practices

This project is exploring and evolving new technology for semi-arid rangelands management as well as empowering and capacitating the humans with skills and tools to sustainably manage the ecosystem while ensuring sustainable livelihoods for the present and future generations.



Land regenerating. Grass growing under bushes/trees

Methodology

Use of a research and development action model. Its participatory approach and skills transfer on managing arid and semi-arid rangelands.

Activities are based on the Major Programme Components

- A. Rangelands Management (planned grazing and combined herding)
- B. Livestock Management (improved productivity and bull schemes)
- C. Community Development (empowerment, capacity building, support for organizational and management structures).

1. Rangelands Management Component

- 1.1 Foster grazing planning and forage assessment;
- 1.2 Develop reliable and clean water sources for livestock;
- 1.3 Instil Fire prevention & response;
- 1.4 Stop Deforestation;
- 1.5 Foster Land use planning;

- 1.6 Resuscitate herding and any other best rangelands and livestock management practices in communities;
- 1.7 Instil sustainable natural resource usage and management;
- 1.8 Monitor rangeland health;
- 1.9 Accelerate over-seeding (Planting grass through animal dung/ grazing and overnighing animals in spots where the grass is to be dropped)

2. Livestock Management Component

- 2.1 Train on Bull/cow ratio; Herd structure; Vaccination and health programme; Animal safety; Mortality management;
- 2.2 Implement Trials on strategic nutrients supplementation (sampling, analyse and apply);

3. Livestock Marketing Component

- 3.1 Assist farmers identify marketable livestock for various sectors of the market (formal and informal);
- 3.2 Coordinate with project committees and buyers about availability of marketable livestock from the farmers;
- 3.3 Share marketing related information with farmers & advise them correctly; Improve quality livestock for marketing;
- 3.4 Resource mobilize and construct Community Abattoirs and Milk Processing Parlours

4. Community Engagement

Involves Ward and Village Level Grazing Governance

- 4.1 Support for organizational and management structures;
- 4.2 Building trust and credibility;
- 4.3 Liaise with all stakeholders;
- 4.4 Assist community to explore issues; train on organizational development (enhance visioning, planning, monitoring and feedback skills)

- 4.5 Develop capacity on group rights to address and control grass and water poaching;
- 4.6 Enhance decision making, joint budgeting, implementation and capacity building skills;
- 4.7 Develop business ethics, co-operative and social entrepreneurship organizations in communities
- 4.8 Develop and establish sustainable partnerships for scale-up and replication and share experiences.



Ecoliteracy and rangeland monitoring with community members



Contribution to Sustainable Farming Systems (SFS) Objectives

1. Raise awareness of the need to shift to more sustainable food systems and to apply a holistic, systems approach to addressing food security and nutrition.
2. Build capacity and enabling conditions for the identification, prioritization, development and uptake of sustainable practices across food systems and facilitate access to financial and technical assistance.
3. Take stock of, categorize and disseminate – and if needed develop – accessible and actionable science-based and/or empirically-demonstrated information tools and methodologies to support governments, the private sector, farmers, consumers and other relevant stakeholders to contribute to more sustainable food systems.
4. Bring together initiatives and develop partnerships to build synergies and cooperation to leverage resources towards the mutual goal of promoting, enhancing and facilitating the shift towards more sustainable food systems.



Results

Intensification of community empowerment on the use of grazing plans by herding clusters in the ward was enforced.

The waterpoint coupled with improved grass saved the community cattle from dying in the severe drought that was experienced during the period.

Other areas without the programme lost cattle from the drought. Also, the cattle produced more milk and manure. The manure was then used to fertilize the vegetable garden at the water point. Thanks to Tudor Grants the Mufiri community cattle were saved from the devastating drought.

Locally, NBI received an award entitled Communicator of the year 2013 from the Banga Chieftainship in Shurugwi District, Zimbabwe. The citation is, “For his efforts to communicate directly from Ward Level to Village Level on the Holistic Land and Livestock Management Program in Ward 5 Shurugwi District, Zimbabwe. He is a real Community Empower and Capacity Builder”.

Internationally, in 2014 NBI received Teach A Man to Fish Pan-African Award Winners. NBI was Country Winner for ZIMBABWE. The citation of the award is, “*Njeremoto Biodiversity Institute (NBI) integrates land and livestock management in its teaching.*”

“Community mobilization is something done by community rather than for the community”.

OSMOND MUGWENI

NBI became an active Partner of the UNEP/FAO 10YFP SFS Programme by invitation from December 2015. NBI attended the First Global Conference held in Pretoria in June 2016 and was invited to make a presentation of its HLLM Programme.

Achievements

NBI achieved much in line with implementation of planned project Outputs on Land Management, Livestock Management and Community empowerment

Land Management

- Restoration of healthy grasslands was achieved to a greater extend.
- Rehabilitation degraded rangelands was demonstrated and achieved
- Restoration of natural water sources was being continually achieved.
- Also, being achieved was recharging of underground water.
- There was marked improvement in reversing desertification as shown inthe visuals below.



Before and after treatment photos

Photos shown are from one of the land rehabilitation sites. The top row shows photos taken in Sept 2015 before treatment. In the photos below, the first picture in each row denotes adjacent area that did not receive treatment. The ones in the other one column per row show the land recovery after treatment where cattle slept over the 50m x 100m site for four (4) nights. There are also areas which received half summer recovery periods from February to May 2016.



VIDCO 2 Area that received normal grazing in summer 2/09/2014



VIDCO 2 Area that receive summer recovery from February to May 2/9/2014

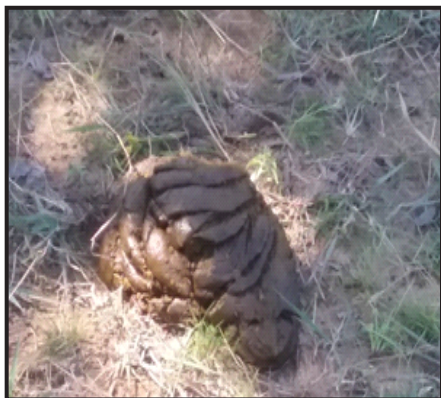


VIDCO 3 Area that received normal grazing in summer 4/09/2014



VIDCO 3 Area that receive summer recovery from February to May 4/9/2014

Degraded Land Rehabilitation and Regeneration: Working with Nature Principle 9



Fresh cattle dung dropped on bare capped ground



Dung beetles incorporating dung into soil. (Source of nutrients and seeds. Grass grow healthy the following season. Working with nature principle to heal the degraded rangelands)



Land regenerating. Grass growing under bushes/trees



Ecoliteracy and rangeland monitoring with community



Ecoliteracy and rangeland monitoring with community



Ecoliteracy and rangeland monitoring with community

The improved rangelands from HLLM can be seen in the picture taken on the same date below.

Same Hill Shurugwi & Chivi
Yes its management not Rainfall/Climate

Ward 5 Mufiri Shurugwi
Mbizvo Cluster Apr 2017



Ward 1 Chivi Madamombe
Same Day Apr 2017



Contrasts: Treated and untreated rangelands

Livestock Management

- Improve herd management was achieved by combining community herds and practising herding guided by grazing plans.
- Increased herd productivity was achieved. Increased calving percentage of 30% of the breeding cows.

- Creation of Community agro-processing, such as, Community Abattoirs and Community Milk Centres for Amasi and Yoghurt was not achieved. This was due to lack of a budget line the grant and we could not secure extra funding from other partners, In Phase IV, funds permitting, this socio-economic benefit of the programme would be emphasised

Table 2: Mufiri Ward 5: Households and Livestock Ownership Per Cluster

Cluster	Number of all House Holds	House Holds Participating	House Holds Not Participating	Number of Cattle Participating	Number of Cattle Not Participating	Number of Groups	Number of People in Each Group	Total Cattle
Muchakata	41	20	21	86	109	5	4	195
Roma	66	50	16	180	61	8	6	241
Mutandavari	22	18	4	91	8			91
Chiriya	60	42	18	252	26	6	6	278
Jiri	19	9	10	91	118	5	2	209
Tahwa/Mupanduki	40	12	28	35		4	3	
Nkala/Mauto	27	12	15	102				102
Mateka/Dendere	44	30	14	71	79	7	5	150
Masvimbo/Chirokoto	43	22	21	78	32	5	4	110
Zireva	43	21	22	133	44	6	4	177
Khanye/Takaendesha	45	20	25	86	134	5	4	220
Dhlo/Mazwi	35	25	10	142	39	4	5	181
Total	485	281	204	1347	650	55	43	1954
% ages of Totals	100	59	41	69	31			100



Observing rangelands healing

The figure below shows an example of a grazing plan for the Jiri cluster in Mufiri Ward 5, Shurugwi VIDICO 3.

Mufiri Ward 5: VIDCO 3: Jiri Cluster Grazing Plan Map

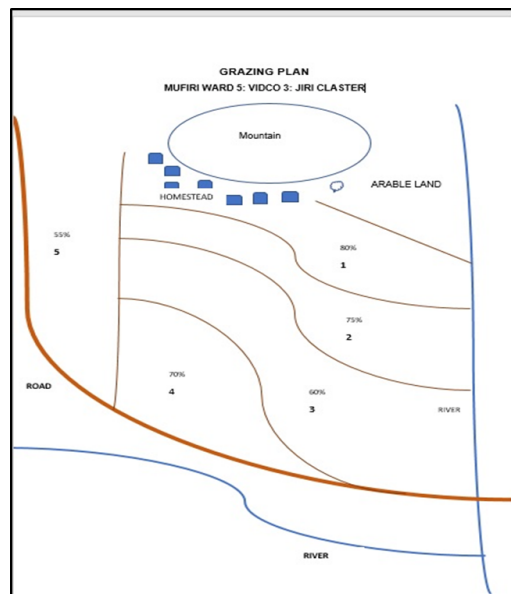


Figure 1: Mufiri Ward 5 VIDCO 3 Jiri Cluster Grazing Plan Map

Table 3: Mufiri Ward 5 VIDCO 3 Jiri Cluster Grazing Plan 2017/18

Grazing area Number using natural boundaries (not fenced)	Grazing Quality Rating	Planned Grazing Period	Number of Herders	Remarks
1	80%	1 to 30 Nov 2017	3	Achieved
2	75%	1 to 31 Dec 2017	3	Archived
3	60%	1 to 31 Mar 2018	3	Achieved
4	70%	1 Jan to 28 Feb 2018	3	Achieved
5	55%	1 to 30 Apr 2018	3	Achieved
Arable Area	90%	1 May to 31 Oct 2018	3	Work in progress
Planned for the following season 2018/19				
1	65%	1 to 30 Apr 2019	3	
2	75%	1 Jan to 28 Feb 2019	3	
3	80%	1 to 31 Dec 2018	3	
4	70%	1 to 31 Mar 2019	3	
5	85%	1 to 30 Nov 2018	3	
Arable Area	90%	1 May to 31 Oct 2019	3	

Note: Grazing area with best grazing quality is grazed first in the Summer Growing season and that with low rating is last.

This allows for land recovery and gives cattle good nutrition all the time. Areas with bare ground, mature capping and gullies in the rangeland are treated during the dry period May to October.

Overnighting the cattle herd on the site to drop dung, urine and apply herd effect. grazed

Table 4: Livestock Production Case: Jiri Cluster

Livestock Production Case of Vidco 3: Jiri Cluster			
Class	2016	2017	2018
Cows	22	29	39
Bulls	3	3	3
Heifers	13	14	13
Oxen	12	10	12
Steers	1	2	7
Young Bulls	5	7	1
Weaner Heifers	0	9	4
Weaner Bulls	0	1	7
Calf Heifers	2	3	6
Calf Bulls	1	3	6
Total Heard	59	81	98
Calving %	10%	20%	30%
H/H with Cattle	9	9	9

The table above shows the livestock production trend from 2016 to 2018. There was significant increase of 20% for calving. This signifies increase in wealth to the community despite having experienced drought challenges in 2017. Figure 3 below shoes the livestock production trend. The scenario applies to all the rangelands under treatment.

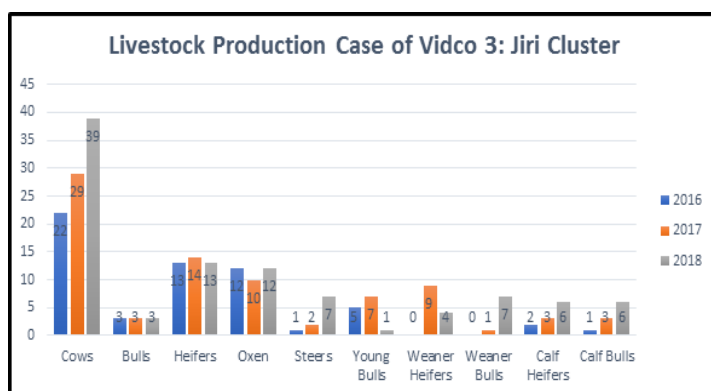


Figure 3: Livestock Production Jiri Cluster

Figure 4 below further illustrates the total cattle head increase.

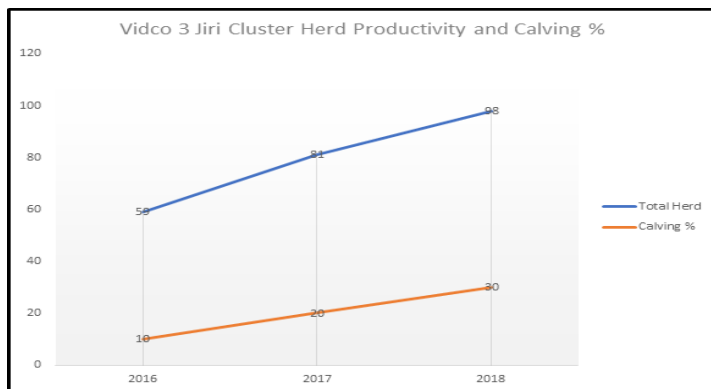


Figure 4: Herd productivity Jiri Cluster

Below are some of the visuals of the cattle head in and healing rangelands in the HLLM project.



Jiri Cluster livestock. Healthy and productive. See the bull, cow and calf



Paroma Cluster Herders with cattle in grazing area



Livestock watering at the developed Solar Underground water point

Community Empowerment

- Increase food and nutrition security was not yet fully achieved. This will be emphasised in Phase IV.
- Increase incomes were not yet fully realised. Will be emphasised in Phase IV.
- Improve livelihoods were yet to be fully achieved. Will be emphasised in Phase IV.
- Agro-processing, value adding, packaging, wholesaling and rural economic growth will be carried over in Phase IV for full realisation.
- More still needs to be done in the area of employment creation and investment opportunities in rural areas.
- Phase IV still needs to continue developing eco and cultural tourism.
- Transfer of knowledge and management skills to farmers was demonstrated and achieved to a greater extent.
- Cohesive, self-reliant, motivated, action-oriented communities were developed.

The main challenge faced was loss of buying power due to economic meltdown. This happened during the years 2015 to 2018.

The loss of buying power was compounded by introduction of the three-tier pricing system in Zimbabwe.

This pricing system came up with different values for the purchase of an item.

Plastic money and bond notes attracted higher purchase price compared to the US dollar.

The system significantly eroded the value of the Tudor Grant because the local banks had no foreign currency.

Banks had very limited bond notes which were so difficult to access.

In trying to mitigate this challenge, the project had to rely on use of plastic money (Swipe and Ecocash), which attracted high prizes during transactions.

To alleviate the challenges the project funds were augmented by increasing the NBI funding contribution.

3.0 HLLM Benefits to Participants

- Improved livelihood,
- social cohesion (shown by herding duties),
- increased knowledge in eco-literacy and rangelands management, and
- good governance (from established management structures).
- Community members now have added skills in leadership and herding.
- To some extent through their leadership structures communities achieved good governance and rule of law.
- In traditional African culture, cattle are viewed as wealth. Hence from the increased cattle herds community members now have increased their economic wealth.
- To date a total of 33 villages out of the 34 in Mufiri Ward 5 are participating on the HLLM Outreach Programme.

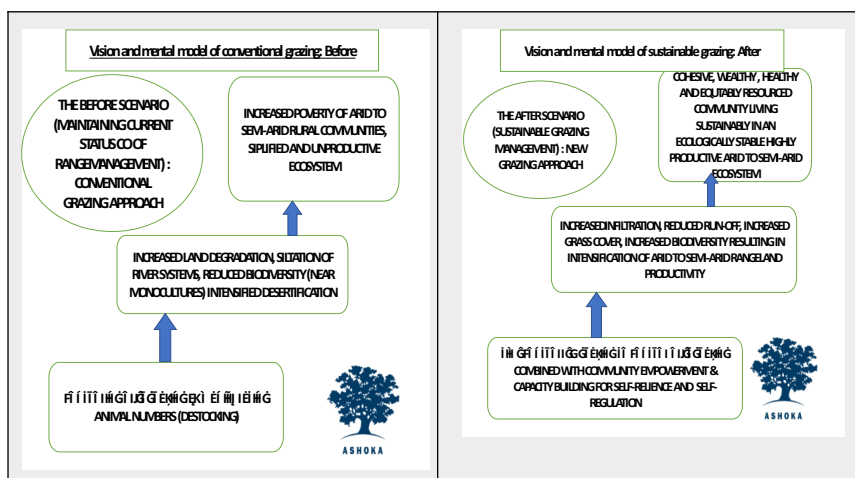
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- Each village has a village grazing management committee. A total of 745 Households out of the 1006 households in ward 5 (74%) are committed to the programme.
- The remaining 261 Households (26%) are not actively participating.
- The livestock herd productivity has increased.
- This is shown by the 30% increase obtained in the calving of the breeding cows. For finer detail, see Table 2 above.
- The 745 households that participated during the phase, translated to 4,470 people (Zimbabwe Census 2013), who benefited from the HLLM programme in Mufiri Ward 5 in Shurugwi.

Conclusions

It is concluded that Vegetation in arid or semi-arid rangelands is a function of human management or land use practice.

The table below shows the conceptual frameworks of the conventional and the HLLM sustainable arid and semi-arid rangeland management.



The HLLM project emphasised the following research and development areas are:

1. Time controlled management grazing.
2. Factors that result in developing healthy grasslands in arid and semi-arid rangelands;
3. Factors that promote healthy rivers and streams in arid and semi-arid rangelands.
4. Factors that promote covered and uncapped soil surface in arid and semi-arid rangelands.
5. Factors that motivate, empower and capacitate communities for collective, productive action for Sustainable Livelihood and Development

Recommendations

HLLM is a functional model that rehabilitates, rejuvenates and develops degraded rangelands for sustainable and improved livelihoods in arid and semi-arid rural ecosystems.

There is need to implement the HLLM model at a larger scale to combat negative effects of climate change and desertification.

The need to develop sustainable collaborative partnerships to effectively implement HLLM and scale up the work globally is emphasised.

There is funding need for documentation and publication of NBI's best arid and semi-arid rangeland management practice.

Assistance in the registration of the HLLM model patent is NBI's urgent need.

HLLM PROJECT PHOTOS



Tank for cattle watering & gardening



HLLM Training Session

HLLM PROJECT PHOTOS



HLLM Training Sessions



HLLM Training Session

HLLM PROJECT PHOTOS



Water Solar Pumping System for cattle watering



Community Discussion on HLLM by Participants