MOVEK Development Solution

Consultancy Report

Stakeholder mapping in Morogoro region

December 2008

(Final Report)

EXECUTIVE SUMMARY

1. The Department for International Development (DfID has been a major supporter of natural resource research through its Renewable Natural Resource Research Strategy (RNRRS) which ran from 1995 to 2006. The results realized through such initiatives have enormous potential to alleviate poverty, promote economic growth, and mitigate the environmental problem. Unfortunately these efforts were not able to produce the expected results.
2. Within this reality, Research Into Use (RIU) programme has been conceived to meet this challenge. The approach used by RIU programme is slightly different from previous approaches since it has shifted its emphasis away from the generation of new knowledge to the ways in which knowledge is put into productive use
3. To complement the innovation system, the RIU programme intended to work with a network of partners (innovation platforms) working on common theme and using research knowledge in ways it hasn't been used before to generate improved goods and services for the benefit of the poor.
4. To start the RIU programme in Tanzania identified three innovation platforms, three farm products in three regions as pilot domains. One of the platforms is access to draught power which is thought to enhance productivity of small holder farmers through increased access to and capacity to utilize draught power opportunities in Ulanga, Kilombero, Kilosa, and Mvomero districts
5. This report is based on the findings of the mapping study conducted in Ulanga, Kilombero, Kilosa and Mvomero districts which overlaped to Morogoro municipality
6. The main objective of the exercise was to undertake a thorough mapping of the relevant stakeholders involved in draught power sector to enhance productivity of small holder farmers in the region. Thereafter to do an initial analysis of the various stages involved in the innovation systems so that the gaps can be identified, see where RIU use can be an actor, and align the factors according to available resources and needs of the stakeholders
7. Findings suggested that the level of use of draught power is still very low. Along the husbandry practice draught power is limited at initial land preparation i.e. ploughing but still only 5-10% farmers were reported to use of draught power. Out of this proportion, the ox drawn plough account for more than 60% while tractor drawn disc plough account for 40%. Huge variation within and between the study districts was recorded. Level of mechanization in land preparation using both tractor and ox-plough was highest in Kilosa, followed by Mvomero and Kilombero where Ulanga recorded the lowest. Use of ox-plough was highest in Gairo division in Kilosa district, Mlimba division in Kilombero district and Mtimbira and Malinyi divisions in Ulanga district
8. There are a number of stakeholders involved in the path to serve the poor through draught power innovation domains. For simplicity we have divided them into four categories viz; demand, enterprise, intermediate and

research domain. Although each domain has a role to play, but those categorized in demand and enterprise domains defines the primary beneficiaries/users of the draught power technology. Name of these key stakeholders are also presented.

9. For each domain the strength, weakness, opportunities and challenges (SWOC) were analyzed and presented so as to allow RIU programme to plan on the best way that their strengths can be used to explore/use opportunities and remove challenges and their weakness can be removed to use opportunities and avoid/accommodate challenges.

10. Based on previous experiences the mapping team identified factors that limits wide-scale mechanization in Tanzania. Based on previous failures the RIU believe that in order to fully explore the benefit of draught power innovation in smallholder settings in the study areas complementarily of the stakeholder is important since a stand alone effort can hardly solve the problem. Innovation platforms with three main areas are suggested

- Promotion of small local machine/tool innovators
- Promotion of intermediate technologies such oxen drawn ploughs
- Promotion of motorized technology (power tillers through tractors) and associated implements throughout crop husbandry chain
- Ensure timely availability of fuel and spare parts
- Enhancing innovative culture among smallholder farmers in the region

Key actors in each intervention indicated above have been elaborated.

11. There are number of weaknesses and gaps which need to be addressed for effective functioning of draught power innovation platform especially in areas such as:

- Innovation needs for the poor
- Productivity enhancement innovations
- Effectiveness and efficiency

12. Based on the observation recorded during mapping, expert opinion our own judgment, 1 members and one Champion have been suggested to form an innovative platform for draught power technology in Morogoro region. Numbers by districts are

- Ulanga 6
- Kilombero 7
- Kilosa 7
- Mvomero 7
- Champion 1

13. The term acknowledge MUVEK Development Solution Ltd for excellent logistical support, DALDOs in all four districts visited for accepting and leading us all the way and all stakeholders contacted for availing information which have been used to produce this draft report. God bless you all

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LIST OF ABBREVIATIONS

ADT	Animal Draught Technology
ARI	Agriculture Research Institute
CBO	Community Based Organisation
DALDO	District Agriculture and Livestock Development Officer
DED	District Executive Director
DEO	District Extension Officer
DEMACO	Developing Mechanized Agriculture Company Ltd
DfID	Department for International Development
KATRIN	Kilombero Agricultural Training Institute
MAC	Ministry of Agriculture and Cooperative
MECO	Mang'ula Engineering Company
MMT	Mang'ula Machine Tools
NGO	Non Governmental Organisation
NMB	National Microfinance Bank
PADEP	Participatory Development Programme
RIU	Research Into Use
RNRSS	Renewable Natural Resource Research Strategy
SUA	Sokoine University of Agriculture
SURUDE	Sustainable Rural Development
TANROAD	Tanzania Road Agency
TASAF	Tanzania Social Action Fund
TMV1	Tanzania Maize Variety 1
TXD series	Tanzania ex Dakawa
UMADEP	Uluguru Mountain Development Programme
URT	United Republic of Tanzania
WOPATA	Women in Poverty Alleviation
ZRELO	Zonal Research and Extension Liaison Officer

Executive Summary

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21. There are a number of stakeholders involved in the path to serve the poor through draught power innovation domain. For simplicity we have divided them into three categories viz; primary, secondary and tertiary domain. Although each has a role to play but those categorized in the primary

domain have direct contact with the farmers. Name of these key stakeholders are also presented.

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Chapter 1: Introduction

1.1 Background to the exercise/study

The Department for International Development (DfID) has been a major supporter of natural resource research through its Renewable Natural Resource Research Strategy (RNRRS) which ran from 1995 to 2006. The results realized through such initiatives have enormous potential to alleviate poverty, promote economic growth, and mitigate the environmental problem. Unfortunately these efforts were not able to produce the expected results. Within this reality, Research Into Use (RIU) has been established to meet this challenge. RIU approach is slightly different from previous approach since it has shifted its emphasis away from the generation of new knowledge to the ways in which knowledge is put into productive use. According RIU document, the key challenge is the innovation process through which entrepreneurs and other stakeholders harness new ideas in order to increase production, add value and create new products and services. Specifically, the RIU programme seeks to empower the poor and marginalized so that they can participate in dynamic national innovation systems.

Innovation i.e. - the process of putting significant use of new ideas, new technologies or new ways of doing things in place or by people where they have not used before - is the heart of the programme. The programme believes that through innovations more goods or services will be produced with less effort or resources and/or produce better or different goods or services. To complement the innovation system, the RIU programme intended to work with a network of partners (innovation platforms) working on common theme and using research knowledge in ways it hasn't been used before to generate improved goods and services for the benefit of the poor.

To start with, RIU programme in Tanzania identified three innovation platforms and three farm products in three regions as pilot domains. These are:

a) Post harvest platform - aiming at how to maximize the income of smallholder farmers' from rice and maize markets through better grain quality and reduced post harvest losses in Morogoro region
b) Access to draught power platform – which is thought to enhance farm productivity of small holder producers through increased access to and capacity to utilize draught power opportunities in Ulanga, Kilombero, Kilosa, and Mvomero districts
c) Dairy platform - which will study how to use the income opportunities in the dairy sector through enhancing production, processing, and marketing of milk in the smallholder sectors in Tanga and Coast regions

This synthesis presents a report of a mapping study that identified key players for increased access to/and capacity to utilize drought power platform

1.2 Description of TOR

1.2.1 Objective and scope of the work

The main objective of this exercise was to undertake a thorough mapping of the relevant stakeholders involved in draught power sector to enhance farm productivity of small holder farmers in Morogoro region. Thereafter to do an initial analysis of the various stages involved in the innovation systems so that the gaps can be identified, see where RIU use can be an actor and align the factors according to available resources and needs of the stakeholders.

The study was sought to cover key aspects which involved mapping potentials actors along the innovation systems that were identified during the previous stakeholders' meeting (see Annex 1). As such, the study was designed to collect and access key information on values of potential actors who can address the functions of the innovation challenge such that groundwork for future collaborations, partnerships and consultations are laid.

1.2.2 Activities that were to be undertaken

In order to accomplish the above stated objective the following activities were proposed by the client

a) Map all key actors, responsible in one way of the other with draught power, residing in Morogoro region (Ulanga, Kilombero, Kilosa and Mvomero districts)
b) List existing initiatives in each study district
c) Identify potential research outputs around the challenges
d) Describe the linkages of the expected RIU interventions with the existing initiatives and complementarily with the earlier initiatives
e) Identify the intended RIU to poor
f) Perform general systems analysis
g) Identify champion for each platform
h) Prepare and submit a final report

1.2.3 Expected outcome

It was envisaged that the final outcome of the mapping exercise is a list of the main actors in the innovation challenge and how these actors interact. This was supposed to be achieved when;

a) All stakeholders by functions have been mapped
b) Stakeholders' strength which need to be maintained are mapped
c) Weakness and gaps in science and innovation platforms are pointed out to enable RIU act responsively
d) Complementarities and areas of possible greater cooperation with various players are mapped.

1.2.4 Time line

The study was supposed to be conducted for 9 working days from 15 to 24th November inclusive

1.3 Report Outline

This report is presented in five Chapters. After this first chapter, chapter two presents the methodology and approach which was use to conduct this study. The findings are presented in Chapter three while the fourth Chapter has been set aside for presenting gaps and weakness that limits proper functioning innovation system/platform. Last Chapter has presented the list of names who are suitable to be members of the draught power innovation challenge and who RIU programme can contact them for consolidation of draught power platform

Chapter 2: Methodology and Approach

2.1 Approach

Approach used to collect information for this study involved qualitative methods. Work was carried out in a three-stage process as follows: a first stage involved the review of relevant material related to RIU and draught power innovation. A second stage involved designing the methodology for and piloting of stakeholders mapping in the maize and rice producing areas and thirdly discussion with the key stakeholders as outlines below.

2.2 Concept of Mapping

Mapping involved obtaining information about the subject under investigation by establishing the route(s) as directed by the first provider of the information. From farmers' perspective, mapping involved an understanding of the avenues available to them on the use of draught power. From individual arrangements, the study moved to an aggregated level and an understanding of the institutional environments in which the two crops – maize and rice operate, which provided insights into opportunities for change of either individual arrangements or aspects of the environment. Key mapping route involved farming community, extension service, local garage, spare part shops, local inventor of farm implements, SACCOS, CBO, and any individuals who we thought can provide useful information.

2.3 Mapping Team

A team of three people led by the consultant from the Department of Agricultural Economics and Agribusiness at Sokoine University of Agriculture (Morogoro)[1] and other two faculty members from DEMACO (Morogoro)[2] and MUVEK Development (Dar es Salaam)[3] undertook the mapping exercise. The team conducted mapping over five days period, traveling from Mahenge through Kilombero and Kilosa to Mvomero district and Morogoro municipality.

2.4 Travel and Coordination

As guided by the client, mapping was done within maize and/or rice crop-growing areas. Due to time constraint and the need to be effective, the team selected areas to be visited within the districts based on secondary spatial information obtained from the respective District's Agricultural and Livestock Development Officers (DALDOs) prior to beginning of fieldwork. The criteria visitation to particular stakeholder included but not limited to following dimensions:

(a) Agro-climatic and bio-physical factors: suitability of soil and climatic conditions; yields, and unique crop husbandry requirements;

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[3] Mr Eliasa Salehe Tel +255 713 495080 Email: eliasa_m@yahoo.com; eliasa@muvek.co.tz

(b) Socio-economic factors: land/asset holdings of farmers; gender relations; ethnic/cultural differences; characteristics of local fundis, ;
(c) Infrastructure: coverage and quality of roads;

In each DALDO's office secondary information were sought and examined for any spatial patterns in key factors related to mechanization for maize and/or rice production. The team selected the following sites to capture existing differences, similarities, opportunities and challenges in use draught power innovation and chose the appropriate members to form the required innovation platform.

Table 1: Mapping sites by crops and districts

Crop	Districts	Divisions
Rice	Ulanga	Vigoi, Lupiro
	Kilombero	Ifakara, Mangula, Mkamba
	Kilosa	Kilosa, Kimamba,
	Mvomero	Turiani, Mvomero
Maize	Ulanga	Lupiro, Vigoi
	Kilombero	Ifakara, Mangula, Mkamba
	Kilosa	Kilosa, Magole, Gairo
	Mvomero	Turiani, Mvomero,

2.5 Methods and Tools

The DALDOs' offices in respective districts were the initial points of entry. The team gathered some basic information about key players in maize and rice production noting various other arrangements that exist in the entire District (see Figure 1 for position of the districts and mapping route in dotted line).

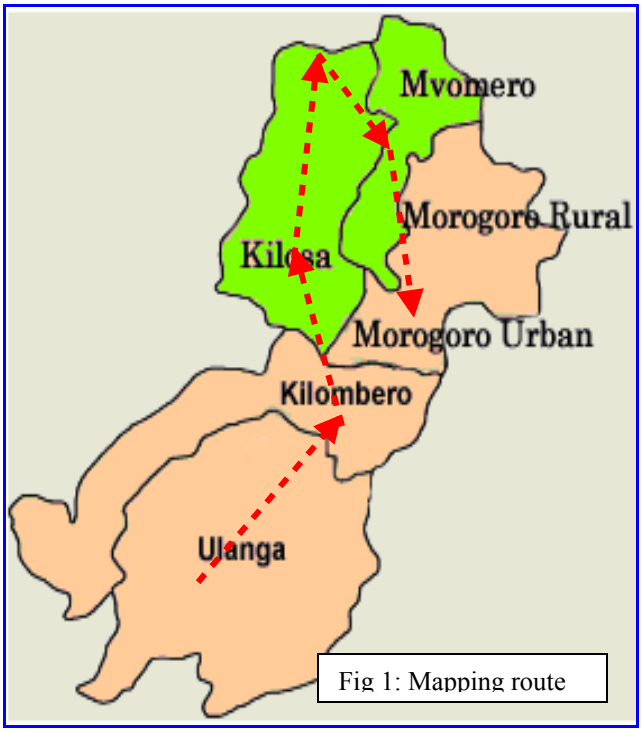

Fig 1: Mapping route

The team used open-ended instruments to gather information on the institutional arrangements and environments in which the two crops use draught power technology at different level of growth.

The questions as proposed by the client and with the help of draught power actors diagram (Annex 1) guided us to cover essential

topics for the two crops, highlighting key issues for discussion with the different stakeholders.

Key informant interviews. The team conducted open-ended interviews with key informants comprising representatives of the District Agricultural Development Officer (DALDO). Key-informant interviews were designed to allow for comprehensive and in-depth understanding of information on husbandry practices, levels of mechanization, support services and name of other stakeholders who are likely to provide information we needed

In sum, the mapping provided an understanding of the nature of the stakeholder arrangements that exist and challenges/opportunities faced by the various members in serving the farmers better on aspects related to draught power innovations.

Chapter 3: Findings

3.1 The study districts

3.1.1 Ulanga districts

Ulanga district is one of the six districts forming Morogoro region. The district area is 24,560 square kilometers, equivalent to 2,455,309 hectares. About 75 percent which (about 1,841,309 ha of total area) covers Selous game reserve and Kilombero controlled area and 25 percent which is 614,000 ha is arable land which is suitable for agricultural activities. Of the available arable land 614,000 hectare about 9,470 hectares are suitable for practicing irrigation agriculture. According to population and housing census of 2002, Ulanga district had a population of 193,280 people. Populations grow at the rate of 2.4 percent per annum. It was estimated to have population of 212,597 people by end of the year 2006.

Administratively, the district is divided into 5 divisions, 24 wards, 65 villages and 308 sub villages. The district receives bimodal rainfall pattern. Short rains starts from October to December and long rains from March to June. Average rainfall is 1500 mm and Temperatures varies from 17°C – 20°C along the Mahenge Mountains to 25°C-32°C in the lowland/flood plains.

The district's residents are engaged in agricultural production and livestock keeping. About 90 percent of the total population depends on agriculture. Thus, agriculture is the main economic activities others are mining, ecotourism and trade. Main crops grown include maize, rice, cassava, ground nuts and cotton.

The 2007 – 2010 District Agricultural Development Strategy (UDADS) (see Hella and Nyanga, 2007), indicted that the districts has huge opportunities for agricultural development. These include: (i) Availability of Labour (people with interest in Agriculture), (ii) Availability of 17 rivers with possibility of irrigation agriculture, (iii) Available fertile land, (iv) Good valleys suitable for both crop and livestock production, (v) Available micro climate for agriculture with good forests, (vi) Availability of animal power and farm yard manure, (vii) Existence and availability of 51 extension staff, (viii) Reliable rainfall for crop production, (ix) Available road network, (x) Enough land for livestock feeding (xi) Availability of savings and Credits societies and farmers groups, (xii) Good environment for agricultural production, (xiii) Good communication systems by telephone, (xiv) Availability of farmers groups and its network, (xv) Availability of Stockiest and inputs suppliers, (xvi) Availability of research station e.g. KATRIN, ILONGA and SUA and (xvii) Good governance and political will to support agricultural development.

On the use of draught power, information gathered from DALDO office Mahenge indicated that only 5% and 15% of the farmers use tractors and ox-plough for land preparation respectively. About 80% use hand hoe for primary land preparation. A very recent farm implements census show that there are 65 tractors and 10 power tillers in the district. Use of ox-plough is fast increasing due to in

migration of Sukuma agro-pastoralists from Shinyanga and Mwanza. Most tractors are owned by individuals, churches, and few farmer groups. Annually, the Ulanga District Council (UDC) requests tractors operators/owners from different parts of the country to bring tractors to the districts during peak season i.e. October – December.

3.1.2 Kilombero district

Kilombero District is one of six Districts of Morogoro Region, other districts are Morogoro Rural, Morogoro Urban, Ulanga, Mvomero and Kilosa. The Kilombero District has 400,000 hectares of a plain land suitable for agriculture activities such as farming, fishing, and animal husbandry. The District extends from the middle to far south-west of Morogoro Region. It is bordered with Morogoro Rural to the east and Kilosa to north-east. The north and west borders are shared by Mufindi and Njombe Districts of Iringa Region while at its south and south-east it shares the border with Songea - Rural (Ruvuma Region) and Ulanga District respectively. Most of the District lies along Kilombero Valley a part of Rufiji Basin which extends below the Udzungwa mountains from its east towards the south-west. The greater part of the Kilombero Valley consists of large alluvial plains situated at an elevation of slightly less than 300 meters above sea level (masl).

There is 300 Km. of good highway from Dar es Salaam to Mikumi, from Mikumi to Ifakara there is an 110 km. all weather gravel road. The road from Ifakara to other villages and hamlets need work, presently the government is developing the road to Mofu. There is also a railway line in the area. The rail goes from Dar es Salaam to Zambia with railways stations along the way in Msolwa, Mang'ula, Kibelege, Ifakara, Ruipa, and within 15 km. of Kilombero farms, Mbingu, Mngeta

The climate in Kilombero can be described as tropical to sub-humid favorable for human living. A summary of climate data is presented below. Four main seasons can be distinguished: - hot. wet season from December to March, cool wet season from April to June, - cool dry season from July to August, - hot dry season from September to November.

There are fluctuations between day and night temperatures as between seasons. The high temperatures are in the November and December months. The low temperatures are observed during the cool dry season, particularly in June when temperature may fall as low as 12·C. On the other hand 38 C can be recorded in November.

Annual rainfall in the district is from 1,200 - 1,400 mm. and rainfall in the highlands is 1600 mm. seldom is the rainfall throughout the year in Kilombero district less than 1100 mm.

The current population is estimated to be 174,920 people with a birth rate of 3% p.a. The District's workforce is about 70,000 people excluding children, disabled and old people.

Good land terrain comprising flood plains, climate and rivers, the district is potential for production of rice, maize, sugarcane, banana, beans and to some extent simsim and sunflower. Like in Ulanga district, use of draught power is limited to land preparation and herbicide application. Data obtained from DALDO office Ifakara indicate that the districts has about 90 farm tractors, 30 power tillers, 161 ox-plough, 90 tractor disc ploughs, and 50 solo sprayers. Statistics show total number of tractors required is 405. The shortage tractors are covered by requesting tractors from outside the districts particularly during peak seasons i.e. during land preparation.

3.1.3 Kilosa district

Kilosa district is the oldest district in Morogoro region. To the north the district borders Tanga and Arusha regions, to the east is Mvomero district. On the western border are Dodoma and Iringa while Kilombero district borders to the south. It lies between latitudes 6º South and 8º South and longitudes 36º 30' East and 38º West (NBS, 2003). The district occupies an area of 14 918 square km and according to 2002 population census, the district has 1 753 362 people.

The area is characterised by semi humid climate, receiving an average rainfall of 800 mm annually. The district receives rainfall in eight months (October-May) with highest levels between February and March. Temperature ranges from 18ºC in the hills to as high as 30ºC in the lowlands. Although Kilosa district has two rain seasons, the pattern and amount of rainfall allow for one harvest of the main staples per cropping season. The early rains start in November and end in January followed by the period of heavy rainfall between March and June. The district experiences a long dry season in June to October.

The main economic activity in the district is crop production and livestock keeping. Over 77% of people in Kilosa district are fully depending on agricultural activities (URT, 2003). Major crops cultivated include maize, paddy, sorghum, cassava, and legumes. Major cash crops are cotton, sisal, sugarcane and oilseeds. Livestock keeping is also an important economic activity in the region. Kilosa is the most favoured District in terms of densities of tarred roads in the region when compared to other districts. However, feeder roads are not passable during the rain season thus cutting the remote areas from other parts of the Districts (NBS, 2003).

Statistics from DALDO office Kilosa indicate that there is 281 farm tractors, 19 power tillers, 2668 pair of oxen, 2668 ox-plough, and 488,417 hand hoes. Compared to other districts, use of oxinazation is higher in Kilosa than other three study districts.

3.1.4 Mvomero district

This is the recently established district in the region. The district is among the six districts in Morgoro region other districts include Kilosa, Kilombero, Morogoro Rural, Morogoro Urban and Ulanga. The district is located at northeast of Morogoro region between latitudes 8º 00" and 10º 00" south of the equator and

between longitudes 37° 00" and 28° 22" east of Greenwich. It borders Kilosa district to the east, Ulanga and Kilombero districts to the south, Kilosa district to the west and Arusha region to the North (URT, 2003). According to the population census of 2002, Mvomero District has a population of about 260 525 people with a population growth rate of 2.6% with an average of 4.6 people per household and an average population density of 22.3 persons per square km URT, 2003).

The altitude of district is between 380 meters and 1,520 meters above sea level. This altitude provides a suitable climate for tropical and subtropical varieties of crops. The district receives a bimodal type of rainfall with peaks in April and December for long and short rains respectively while May to October remains relatively dry. The average rainfall amounts to 1 200 mm per annum with variations from 800 mm to 2 000 mm. Average monthly rainfall is about 106 mm making up a total annual rainfall of about 1 270 mm. The district's economy like most of Morogoro districts depends on agriculture mainly from crop production. The main crops grown are cassava, rice, maize, and bananas. Other crops include beans, millet, peas, potatoes, coffee, groundnuts, citrus fruits, mangoes, jackfruits, sugarcane, coconut, tomato and eggplant. With exception of few paddy and sugarcane fields, cultivation is carried out mainly by use of the hand hoe, using primarily family labour and hired labour when the situation demands. Tractors are available only to a few individuals. Livestock keeping is also practiced in the area but with few numbers engaged.

3.2 Stakeholder mapping and Champions for each domain

Stakeholders include any individuals, groups of people, institutions or firms that may have relationship with the intervention. Prior to conducting this mapping study stakeholders analysis was carried out identifying all those who are likely to be affected positively or negatively by the draught power interventions. These were categorized into five main domains namely; demand, enterprise, intermediary and research. In these four domains key stakeholders include; Central and Local government Authority (i.e. Mvomero District Councils (MDC), Ulanga District Council (UDC), Kilombero and Kilosa District Council), draught power users (comprising farmers and livestock keepers), draught power providers such tractor owners and operators, spare parts providers, fuel suppliers, local fundis, rural innovators and Development facilitators such as NGOs, CBOs, funding agencies (such as Banks and SACCOS), Donors, political parties etc

3.2.1 The domains

Weakness and gaps in science and innovation for draught power platforms need to be pointed out so as to enable RIU programme act responsively to solve farmers' problem hence remove them from poverty trap. Analysis of the Strength, Weakness, Opportunities and Challenges (Threats) (SWOC) for domains within the draught power platform is presented. SWOC analysis is one of the most important steps in project planning because it provides the image of the reality of the institutions and external factors affecting them. Information from SWOC

analysis should be used to consolidate a platform for better analysis of problem(s) draught power platform. In the subsequent sub-sections SWOC analyses for the Demand, Enterprise and Research domains are presented.

- **Demand domain**

  Demand domain is central for draught power platform and is centered on maize and rice farmers in the four study districts. In all four districts it was reported that all households cultivates maize but in different proportions. Rice although an important food and cash crops in all four districts, production is limited in valley and flood plains where rainfed and limited irrigated production is done. Key actors in this domain include; small, medium and large scale farmers, public institutions, non government institutions, community based organisation, religious groups. Stakeholders belonging to this domain who were contacted during mapping assignment are listed in Annex 2 below.

  SWOC analysis of the demand domain is presented below.

  - **Strength of this domain**
    - All districts have ample land for mechanized rice and/or maize production (Kilombero valley, Mkata plains, Gairo plateau etc.),
    - Well organized leadership structure from village, ward and division and up to district levels.
    - Some farmers are members of well organized SACCOS and other farming based community organizations
    - Good mobile phone network
    - Presence of oxen brought in the districts by migrating tribes such as Masaai, Sukuma, Datoga and Mang'ati
    - Presence of high quality machine parts fabricating plants at Mangula, Kwiro, Morogoro,

  - Weaknesses
    - Low level of entrepreneurial knowledge among farmers
    - Small and often scattered farm plots for optimal and effective use of draught power technology
    - Lack of capital to invest into or hire expensive farm machineries
    - Low level of mechanized agriculture
    - Lack of animal raring culture among Pogoro, Ndamba, Mbunga, Vidunda, Sagara, and luguru

  - **Opportunities**
    - High local and international markets demand for maize and rice produced in the study districts
    - Presence of many rivers for irrigated maize and rice farming
    - Existence of companies (e.g. GEMACO; Intermech, MECO etc.) which can link farmers technology providers so that they to user friendly draught power technologies

- High possibility of attracting farm tractors from other regions in the country especially during land preparation
- Existence of public extension service (with some knowledge on mechanization) at ward and sometime at village levels
- Presence of research & training institutions such as KATRIN (Kilombero), Ilonga (Kilosa), Cholima (Mvomero), SUA (Morogoro urban) thus assured of high quality research outputs
- High support from the Nation since the region is designated as national granary (FAMOGATA).

❖ **Challenges**

- Poor road network especially during rain season which limits timely availability of fuel, spare parts, and other input especially to villages located in remote areas
- Unreliable rainfall making farming to be high risky enterprises thus farmers opt for low input technology (i.e. hand hoe).
- Lack of draught power technology for other farm operations such as planting, crop protection, weeding and harvesting,
- Low prices offered by traders for farmers to realize profit which can be used to investing in modern farm power technology.
- Lack of knowledge on proper use of farm machineries which results to poor quality works.
- Lack of standardized measurement such as acre cultivated or kilogramme of harvest which to exploit the farmers thus leads to high complains from farmers
- Hard clay soil which limits effective use of farm tractors early in farming season.

o **Enterprises domain:** This domain comprises stakeholders involved in utilization of draught power technology and other natural resources related to draught power technology. These include those listed in demand domain i.e subsistence, medium and large scale; farmer organisation, companies, Stakeholders belonging to this domain who were contacted during mapping assignment are listed in Annex 2 below

❖ **Strength of this domain**

- High willingness to use draught power as shown by farmers in all study districts
- Recent introduction of large number of cattle (oxen) by Sukuma, Masai, Datoga, in the districts which can be trained for carrying out various farm operations
- Willingness of the farmers to continue producing rice and maize
- Existence of DALDO and other public support services to promote use of draught power technology to farmers
- Existence of policies, Acts, Regulations, and local By-laws on access and use of natural resources and other factors of production which important for maize and rice production in the region.

❖ **Weakness**

- Small and scattered farm plots thus increase operation costs on farm tractors through driving from one plot to another
- Poor condition of most farms due to presence tree stumps, stones, and ridges for effective operation of farm tractors
- Lack of cattle rearing culture among the indigenous tribe which limits the uptake oxinization technologies
- Low capital formation by small farmers thus they lack cash for buying expensive mechanized farming
- Limited availability of capital from formal, semi-formal financial institutions due to lack of collateral.
- Weak SACCOS to avail funds or guarantee farmers to access funds from formal financial institutions
- Lack of well trained tractor operators

❖ **Opportunities**
- Good land for large scale mechanization
- Government's interest to make Morogoro region a national granary (FAMOGATA)
- Existence of few well established SACCOS to guarantee farmers willing to obtain farm implements loan.
- Existence of local artisans (Fundis) such as Kwiro (Mahenge), NIDO engineering (Ifakara), MECO (Mangula), wakulima (Turiani), willing to fabricate important spare parts and maintain farm tractors
- Presence of technical support from training institutes such as Kwiro, St Fransis, MATI Ilonga and ARI Cholima, and SUA

❖ **Challenges**
- High interest rates for loans obtained from financial institutions
- Limited availability of spare parts especially from shops at district levels,
- Presence of poor quality spare-parts in the market
- Poor road network especially in Ulanga and Kilombero district thus hampering timely availability of fuel and spare-parts especially during rain season
- Local fundis have no working capital and are less mobile to attend tractors grounded at the farms
- Very few shops which are specialized in draught power spare-plants
- High cost of imported spare-parts

o **Intermediary domain:** This domain comprises stakeholders involved in providing support services for effective utilization of draught power technology by farmers in the region. These include Extension service, NGO, schools, churches, prisons, communication companies (TV, radio), input supplier (spare parts dealers, fuel suppliers) and informal knowledge transfer system. Stakeholders belonging to this domain who were contacted during mapping assignment are listed in Annex 2 below

❖ **Strength of this domain**

- Some have good knowledge about social and cultural settings of maize and rice farming communities in study areas
- Members are relatively more trained than farmers thus they can advice them positively
- Some have well established networks with partners within and outside the country
- Most are highly motivated to assists farmers to increase productivity and do away and out from poverty traps

❖ **Weaknesses**
- Lack of capital thus high depended on donor funds both for recurrent and development budget
- Lack or limited mobility to reach farmers in remote villages

❖ **Opportunities**
- Existence of well established umbrella organisation (e.g. MVIWATA, TANGO, SCULT etc.) at regional and national levels
- Presence of enabling national policies for draught power research and development.

❖ **Challenges**
- Limited innovative culture and entrepreneurial knowledge among local farmers

o **Research domain:** This domain comprises stakeholders involved in research activities (public & private; local and international), universities, Agricultural training institutes, VETA, etc. which in one way or the other are related to draught power technology in the region. Stakeholders belonging to this domain who were contacted during mapping assignment are listed in Annex 2 below.

❖ **Strength of this domain**
- Have well trained members on different aspect of crop husbandry and draught power technologies
- Have several research results useful for increasing farmers' production within their domain
- Have limited mobility to reach major proportion of the farmers in the region
- Have high relationship with other local and international research and other CGIAR centers.
-

❖ **Weaknesses**
- Limited funds for financing various research operations and investment activities
- Weak undefined linkages between research domain and others intending to serve the farmers
- Dependence on Government subventions to finance several research activities

— Putting more emphasis on agronomic & breeding research with limited attention on draught power technologies research.

❖ **Opportunities**
— Farmers are still willing to continue growing rice and maize
— Designation of the region as national good granary (FAMOGATA)
— High collaborative support from international research organisation such as CIMMTY, WADA, IRRI, etc.
— Sometimes receive research funds from international organisation such as ASARECA, DFiD, USAID,

❖ **Challenges**
— Low uptake of technologies developed by such research stations
— High climate variability
— Increased dependence on imported technology

3.2.2 Champions in each domains

Based on expert analysis done by consultants the champions (i.e. those who have high command on proper functioning of the platform) for each platform is presented in Table 2 below.

Table 2: List of champions for reach domain by district

Domain	Ulanga	Kilombero	Kilosa	Mvomelo
Demand	Farmer – Yakubona Moses	Ramesh Haridas	Festo Mizengo	Dakawa rice farmer (Wawakuda)
Enterprise	Teachers SACCOS	Ifakara SACCOS	Maendeleo SACCOS	Tuli SACCOS
Intermediate	DALDO	DALDO	DALDO	DALDO
Research	KATRIN	KATRIN	ARI Ilonga	ARI Cholima

3.3 Value chain linkages (within and between domain)

Value chain linkages analysis involves identifying and assessing opportunities in the draught power technologies by involving many actors along the use chain. Value chain stimulates networking, link use of innovation with providers and foster productive partnerships based trust and knowledge sharing. Thus in order to capture value chain linkages, its important to understand that both maize and rice have standard husbandry practices which are specific to the crop. These husbandry practices include:

a) Primary land preparation
b) Secondary land preparation
c) Planting (transplanting for rice)
d) Weeding (1st and sometimes 2nd weeding)
e) Crop protection against pest attack while at the field
f) Harvesting,
g) Transportation

The advantage of using draught power in maize and rice production include increasing productivity of labour, expanding areas under cultivation as well as increasing the intensity of land use, improving quality and timeliness of operation.

In general the level of use of draught power is still very low. Along the husbandry practice listed above, draught power is limited at initial land preparation i.e. ploughing is still. Estimates indicated that only 5-10% farmers are reported to use of draught power technology. Of which ox drawn plough account for more than 60% while tractor drawn disc ploughing account for 40%. Huge variation within and between the study districts was recorded. Level of mechanization for land preparation using both tractor and ox-plough was highest in Kilosa, followed by Mvomero and Kilombero where Ulanga recorded the lowest. Use of ox-plough was highest in Gairo division in Kilosa district, Mlimba division in Kilombero district and Mtimbira and Malinyi divisions in Ulanga district.

With increased weather variability planting has turned out to be a very critical activity in smallholder farming. During mapping mechanized planting (or transplanting) was not reported except at Gairo division where planting is carried out concurrently with land preparation where a farmer drop maize seeds after two or three furrows opened by ox-plough. The process although widely used is not recommended because places seed at varying planting depth and tends to use high seed rates.

Weeding is another critical and highly expensive exercise. Mechanized weeding was not reported except in isolated cases in Kilombero, Mvomero and Ulanga particularly among rice farmers who use hand operated pumps (Solo sprayers) to spray pre or post emergency herbicides such as 2,4D amine, Round-up.

All maize farmers and 99% of rice farmers harvest their crops by hand. This was reported to be the main reason which grossly hinders area expansion. Use of mechanized harvesting was only reported at Dakawa Rice farm mainly because the plots are large and are fairly level for effective and profitable mechanization

Value chain linkage for draught power technology is presented in Figure 2 below

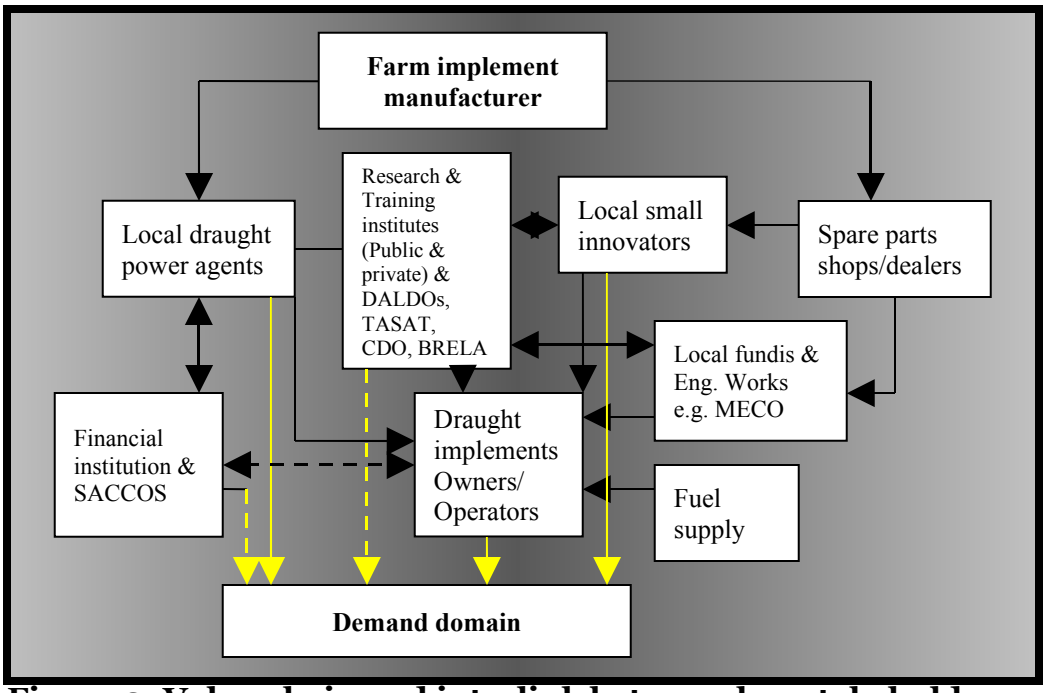

Figure 2: Value chain and interlink between key stakeholders

- Working directly with farmers – local draught agents imports good quality tractors that fit technical, social, economic condition of local recipients. Tractors owners/operators who provide services to farmers. Farmers require their service at required time, at good quality and at reasonable prices. Another group which work directly with farmers include are local small scale innovators who have to supply their perfected equipments to many farmers at low prices.
- Financial institutions (formal, semi-formal and informal) NGO, CBO, Government (DALDO, Community Development Office, BRELA, TANROADS, TASAF), Research & Training Institutes, Churches, Schools support services and empower the demand domain so that the latter effectively receive and utilize available draught power effectively. In addition government institutions must as regulatory body so that fare trade is maintained between the suppliers and used of draught power technologies.
- In order for draught technology properly utilized by farmers support services such as fuel supply, spare parts, communication and IT technologies must be in place

Reference is made on value chain framework as presented in Figure 2 above. Based on the number of factors listed above, it is clear that in order to fully explore the benefit of draught power innovation in smallholder farm settings in the study areas, complementarily of the stakeholders is important since experience show that stand alone effort can hardly solve the problem. The following complementarities are suggested.

3.3.1 Promotion small local machine innovators

The local innovators fill an important gap in smallholder transition to mechanization. Simple machines which are fabricated if produced in large quantities can greatly multiply labour thus increase labour productivity. Main problem facing these innovators are three; lack of capital, lack of raw material and working in isolation.

— Invite public institutions such as SUA, ARIs to further perfecting their invention
— Invite BRELA/Costech to recognize their invention
— Join hands with MECO, Intermech, or Demaco for perfection of the technology
— Access funds from formal or informal financial institutes such as NMB, CRDB and SACCOS for purchasing raw materials which are considered to be expensive
— Let MECO, Intermech or Demaco to produce in large quantities
— Promote the product through local media
— Sale to farmers directly or through their grass-root SACCOS or groups

3.3.2 Promotion of intermediate technology such as ox-plough

Uses of oxen for farm operation have two facets. First, one must own the oxen and two is the ownership of a plough. As mentioned above, in the study area the use is skewed with high concentration in areas where the residents have livestock keeping culture. The complementarities required here are those which will change the mindset of the people thus make them keep oxen for farm work. Stakeholders suggested include

— DALDO should start sensitization workshop
— SUA through department of Agricultural Engineering provide training of BBC
— DED through special programmes such as TASAF, or Community Development Officers facilitate the farmers to create this project
— SACCOS, Semi-formal financial agents such as FINCA, should be approached to provide loan to buy ox-plough, harrow and planters,
— Intermech, Gemaco, MECO, in collaboration with SACCOS, DED, DEO locally fabricate ox-drawn implements suiting local condition

3.3.3 Promotion of power tillers, Tractors other tractor drawn implements

Reaching higher levels of motorized draught power innovation should be the aim of all farmers in a process to increase labour productivity and hence reduce poverty. On the part of the farmers, the most limiting problem is lack of capital to hire tractors, small farm size for profitable tractorisation, poor access roads to the farms, soil type, timely availability of tractors for various farm operations etc.

Fig 3: Power tillers

On the part of tractor operators problems include lack of capital to buy tractors, limited use of tractors due to seasonality nature of farm operations, limited availability of tractors. In order to realize this potential the following cluster is suggested

— Farmer or group of farmers should plan their plots for mechanized farming
— Financial support from locals SACCOS to provide soft loan for mechanized operation
— Public Research institution to do research related to suitability and compatibility between tractors, implements, to soil types
— SACCOS to support farmers wishing to buy tractors
— Gemaco to supply tractors and after sale services
— Training institutes such as SUA, Ilonga, Cholima, SUA to train tractor operators
— Financial institution to provide loans to SACCOS and individual farmers so that the latter can borrow funds

3.3.4 Timely availability of fuel

Effort towards mechanization is one thing but timely availability of fuel at affordable price is quite another thing. Since all these have significant impact to the price farmers are supposed to pay for the service. During mapping it was established that which one litre of diesel fuel is sold at Tsh 1500 the price at Mahenge (300 km) was Tsh 2200. Main problem advanced by service providers was poor roads necessitates transporters to charge high transport cost per litre, and limited capital that can enable them to bulk fuel when roads are passable.

— TanRoad to make roads passable throughout the year
— DED support hire purchase through poverty alleviation funds
— Service providers should make realist pricing
— Service providers explore the opportunity for bulking during dry season

Fig 4: Local fuel supplying station

3.3.5 Availability of spare parts

Availability of spare parts for the drawn and motorized farm implement both for regular service and other major break-downs is vital. Breakdowns are high early in the farming season because the soils are hard. During mapping, tractors operators highlighted number problems of availability, reliability/quality and high prices of the spare parts. Since most farms are far from urban centers, a person has to travel 100 km to buy a spare. Sometimes such spare part may not be available in district centers thus have to be ordered from Morogoro or Dar es Salaam. In addition, since farming is seasonal and the fact that traders operates using smaller capital, it is difficult for them to stock the spares that meet the

demand year around. This situation affects the timeliness in availability of the spare-parts as stocking is strategically done to avoid stock carry over to next farming season. In this context the following complementarities are suggested:-

- Shop owners (i.e. Teacher) should enter into contract with main suppliers of the spare parts (Yusuf Ally or Ndaki stores) to act as sale agent in an agreement that they will get commission for each parts sold
- Shop owners (i.e. Teacher) should enter into contract with tractor distributors (Demaco, Noble motors, MECO) to stock spares on their behalf and the shop owners be paid commission

Shop owners in district headquarters should establish trust with large suppliers in Morogoro or Dar es Salaam so that the latter can dispatch a spare to district headquarters when requested by phone

3.4 Innovation culture

A number of suggestions or reasons have been advanced as to why the majority people in some part of Morogoro region are poor amid abundant natural resource base. Although no specific study has been conducted in the region, but in a study on problems related to rural development in Sukumaland, Larsen (1974) found that development in the area was hampered by (i) insufficient incentives to make improvement, (ii) limited aspirations, (iii) lack of resources and knowledge about improvements. Ishumi (1984) has forcefully argued that the neglect of the rural people by the bureaucracy, manifested in various mal-functioning and failures of established systems, has overtime led to a dangerous vicious circle of effects: low productivity; little production and reduced income; diminishing purchasing power; economic and social deprivation; degeneration of incentives; frustration and apathy; less production; less income; growing poverty, and low productivity.

Fig 5: Sign post at Ifakara Kibaoni

Based on the information from respective DALDOs it was observed that the need for mechanization is location specific and has positive relation with the tribes. Use of ox-plough and ox-carts is high Sukuma (Ulanga and Kilombero district) and Kaguru (Kilosa district) where as other tribes such as Pogoro, Ndamba, and Mbuga continue year on to use hand hoes. DALDO Mahenge informed us that PADEP tractor owned by Mwaya villages is hardly utilized despite the low charge per acre compared to other places in the district. Entrepreneurial Chagga and Indians uses tractors for land preparation. The following complementarities as suggested


Fig 6: Locally fabricated rice weeding tool

DALDO through extension services, NGOs such as CARITAS, UMADEP, should organize entrepreneurship training to change their mind set.

3.4Framework conditions and Infrastructure (Pro poor policies)

Specific summaries on condition on the framework and infrastructure are presented in section 3.4.1 and 3.4.2 respectively.

3.4.1 Framework condition

Condition	Districts			
	Ulanga	Kilombero	Kilosa	Mvomero
Incentive environment/ policy	Drought Power Policy in place but incentive for widespread use is lacking	Drought Power Policy in place but incentive for widespread use is lacking	Drought Power Policy in place but incentive for widespread use is lacking	Drought Power Policy in place but incentive for widespread use is lacking
Trust	Mostly stakeholders visited indicated low trust to small scale farmers	Mostly stakeholders visited indicated low trust to small scale farmers	Mostly stakeholders visited indicated low trust to small scale farmers	Mostly stakeholders visited indicated low trust to small scale farmers
Culture – propensity to innovation and entrepreneurship	Limited especially the local tribes and grossly lack entrepreneurial skills	Limited especially the local tribes and grossly lack entrepreneurial skills	Limited especially the local tribes and grossly lack entrepreneurial skills	Limited especially the local tribes and grossly lack entrepreneurial skills
Peace and Security	High except at Mtimbira and divisons which have isolated clashes between farmers and agro-pastoralists	High except Mlimba ward which have isolated clashes between farmers and agro-pastoralists	Low due to frequent clashes between farmers and pastoralists	High
Education and literacy	Low except for medium and large scale farmers	Low medium and large scale farmers	Low for medium and large scale farmers	Low for medium and large scale farmers
Corruption	-	-	-	-

3.4.2 Infrastructure condition

Conditions	Districts			
	Ulanga	Kilombero	Kilosa	Mvomero
Transport	Road only; Generally poor especially during rain season, many rivers and poor bridges	Road and Railway (TAZARA), Road network is poor especially during rain season	Road and Railway: Except the tar road Dodoma road, Morogoro – Iringa, and Mikumi – Kilomero, all other roads are poor especially during rain season. Railway line connecting Kilosa through Mikumi to Kilombero is closed	Road (tar road along Morogoro – Dodoma road.
Marketing	No organized markets for rice and maize, traders from Morogoro & Dar es Salaam purchases paddy and maize starting from June - September	No organized markets for rice and maize, traders from Morogoro & Dar es Salaam purchases paddy and maize starting from June - September	No organized markets for rice and maize, traders from Morogoro & Dar es Salaam purchases paddy and maize starting from June - September	No organized markets, traders from Morogoro & Dar es Salaam purchases paddy and maize starting from June - September
Banking, Saving, Credit, informal finance	NMB (Mahenge), 54 SACCOS except 4 Ulange Teachers, Lupiro farmers, Malinyi kasi mpya,) most are very weak and not functioning	NMB (Ifakara), SACOS, PRIDE, FINCA, CNFA,	NMB (Kilosa and Ruana), Number of SACCOS but only few are active these are	NMB (NMB Turiani), TULI SACCOS Turiani,
Risk insurance	Production risks, market risk, No insurance measures to farmers,	Production risks, market risk, No insurance measures to	Production risks, market risk, No insurance measures to farmers, some farmers work in	Production risks, market risk, No insurance measures to farmers

	farmer groups, Farmer groups through SACCOs	farmers, 141 farmer groups through PADEP	groups to spread risks	
Regulation and standards	Less regulations & standards on draught power, Poor work quality, quantity, limited professional standards,	Less regulations & standards on draught power, Poor work quality, quantity, limited professional standards	Less regulations & standards on draught power, Poor work quality, quantity, limited professional standards	Less regulations & standards on draught power, Poor work quality, quantity, limited professional standards
Innovation and business support systems	DALDO offices have mechanization experts, District Community Development officers (loans for women)	DALDO offices mechanization experts, District community Development offices (loans for women),	DALDO offices, mechanization experts, mechanization experts, District Community Development Offices (loans for women)	DALDO Offices, mechanization experts, District Community Development Offices (loans for women
IPR & information systems	Not known	Some effort to register invention reported by Mzee Mwmengo but it he did not succeed	No information	No attempt was made

Chapter 4: Weakness and gaps in science and Innovation performance

4.1 Innovations and Needs of the Poor

Promotion of sustainable and equitable economic growth and socio-economic development among rice and maize farmers in Morogoro region to ensure poverty alleviation with ultimate objective of its eradication is the primary objective of RIU. Base on the observation and information collected during mapping, farmers' level of poverty is relatively high and there are no strong SACCOS to act as guarantee loan. Except at Gairo where the use of ox-drown implement is high simple manual such as hand operated planter, hand operated wedding machine, and at a later stage be given power tillers.

Fig 7 Sign post local innovations

Important weaknesses and gaps

- Limited entrepreneurial knowledge to capture and use available opportunities for mass production of fabricated implements
- Lack locally and mechanically perfected simple hand operated tools
- Local artisans (e.g. Mizengo at Gairo and Mwegole at Ifakara) have limited equity to invest in for large scale production of hand operated tools
- Lack of institution to harness and promote large scale use of local inventions
- Little interest among public and private institutions to create linkages between actors and source of innovation
- Lack of capital (equity or borrowed) to acquire new invention in the market

4.2 Productivity enhancement innovations

As mentioned earlier at all levels (except at few cases in Mvomero district), mechanization is limited to initial land preparation. Hence in a situation like this productivity is hampered by lack of necessary equipments for planting, weeding and harvesting. In this context, innovation such as those demonstrated by Hassan Ally Mwegole (Ifakara) and Festo Mizengo (Gairo) if harnessed can greatly enhance productivity. Other equally important innovations include use of

improved seed of high yielding varieties from Ilonga, Katrin and Cholima research stations.

Important weaknesses and gaps

- Lack of improved seed at spare and time when required
- Local artisans (e.g. Mzalendo at Gairo) have limited equity to invest in large scale production of hand operated tools
- Lack interest for public institutions e.g. BRELA, ARIs SUA, MATIs to harness and promote large scale use of local inventions
- Lack of financial support to empower local innovations for promoting rural technological development.

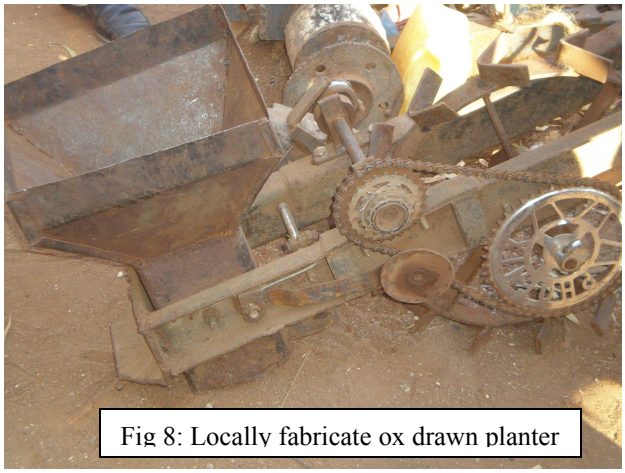

Fig 8: Locally fabricate ox drawn planter

4.3 Effectiveness and Efficiency

Efficiency and effectiveness defines the rate at which all stakeholders in the draught power platform establishes the united and long lasting determination to spearhead of adopting the innovation at village district, region and the nation at large. Poor farmers play a central role in kick starting the process. Effectiveness and efficiency operate in if-if bases. Meaning that if smallholder farmers using their own establishments access and utilize draught power opportunities, if all primary, if all secondary and if all tertiary complementary stakeholders, and if all support services from the Government, private companies, NGO, SACCOS, and others perform their duties effectively farmers will increase access to and capacity to utilize draught power opportunity.

Fig 9: Well established SACCOS at Kimamba

Important weaknesses and gaps

- High level of poverty among small farmers thus they revolve within the vicious circle of poverty
- Very few or none among the stakeholders on the platform tend to trust farmers
- Difficult to harness trust among the participants within the draught power platform
- Dependence of support from actors who are not directly linked to the problem facing farming community

- Adoption of draught power innovation is by itself not a panacea for reducing poverty among smallholder agriculture. Package recommendation on seed, fertilizers, post-harvest technology, accessibility by road and marketing opportunities must be championed concurrently in favor of the farmers.

CHAPTER FIVE: Proposed platform members

This study has covered the key aspects in mapping the key actors who perform different role with varying ability in the existing process to enhance maize and rice productivity through access to and capacity to utilize existing draught power opportunities. It can be noted that for the purpose of this study 45 stakeholders were consulted (See Annex 2) and their credentials evaluated and compared. The main objective was to establish potential actors who can address the function of the draught power innovation challenge. Here under we are presenting names of 24 stakeholders who are better placed to lay a basic frame-work for future collaborations, partnership and consultation along the draught power value chain for rice and maize production within the districts. .

1 **Champion** Kaya Kazema, Gemaco, Tel: 0784 385373, P.O. Box 1222. Morogoro. Fax 0732 930111; email: demacoe@yahoo.com

Table 5: Members selected for draught power platform by districts

#	Name	Position	Postal address/email	Tel. Number
2 Ulanga district				
1	Depo Nyamoro	Mechanization officer	Box 3 Mahenge	0784 639273
2	Ester Liyumba	Owner of fuel stations	Mahenge	0784 639273
3	St Getrude Swai	Kwiro garage	Box 42 Mahenge	0787 003682
4	Pascal Kamota	Local fund at Lupiro	Lupiro garage	0782 347431
5	Luhombero processing	Manger	Mwaya	0783 427797
6	Yakubona Moses	Innovative/progressive farmer	Itete - Mianzini	0784 264931
3. Kilombero district				
7	Mrs Kitua	DALDO Kilombero district	Ifakara DED office	0787 087725 023 262 5140
8	Hassan Ally Mwegole	Local inventor (fabricate farm tools)	Kibaoni Ifakara	0784 683991
9	Herri Abdiel Minja	Owner - spare parts shop	Ifakara	0784 429774 0777 429774
10	Ramesh Haridas (Manu)	Tractor owner/farmer	Ifakara	0784 833529
11	Walter Mwasha	Trained mechanic/farmer	Nido garage Ifakar	0784 820389 0774 820389
12	Victor Kileo	Technical Manager (MECO)	Mang'ula MMT	0784 402445
13	Nkori Kibanda	Officer In charge	Katrin@iwayaafrica.com	0784 419520
4. Kilosa district				
14	Dr Jaochim Materu	DALDO Kilosa	DED Ifakara	0784 305627
15	Mrs Assenga	Principal MATI Ilonga	MATI Ilonga	As Dr Mkangwa
16	Willy D. Dikundile	Manger Maendeleo SACCOS	Kimamba Kimamba	0787 604295
17	Winkam Low (China)	Local tractor fundi	Kimamba	0784 517472
18	Festo Mizengo Mzalendo	Fabricate farm tools/magari	Gairo	0753 542305
19	Yusuf Ally	Own tractor spare pasts shop	Morogoro	
20	WOPATA ''	Women NGO	Morogoro	
Mvomero district				
21	Mr Kizuguto	DALDO Mvomero district.	DED Mvomelo	0755 559949
22	Mr Hozariel Foya	DEO/PADEP	DED Mvomelo	0754 574692
23	Nicholas Mzava	Manager TULI SACCOS	Madizin Turiani	0784 406920 023 2625325
24	Daniel Chilosa	Member UWAKUDA/farmer	Cholima Research Institute	0754 688665
25	Iddi Ndaki	Own tractor spare shop/farmer	Morogoro	0784 390011
26	Imma Metta (Ask his father)	Own a tractor (Wakulima)	Turiani	0784 432433
27	Dr Mwampamba	Tractor Operator Trainer	SUA Morogoro	0752 309090

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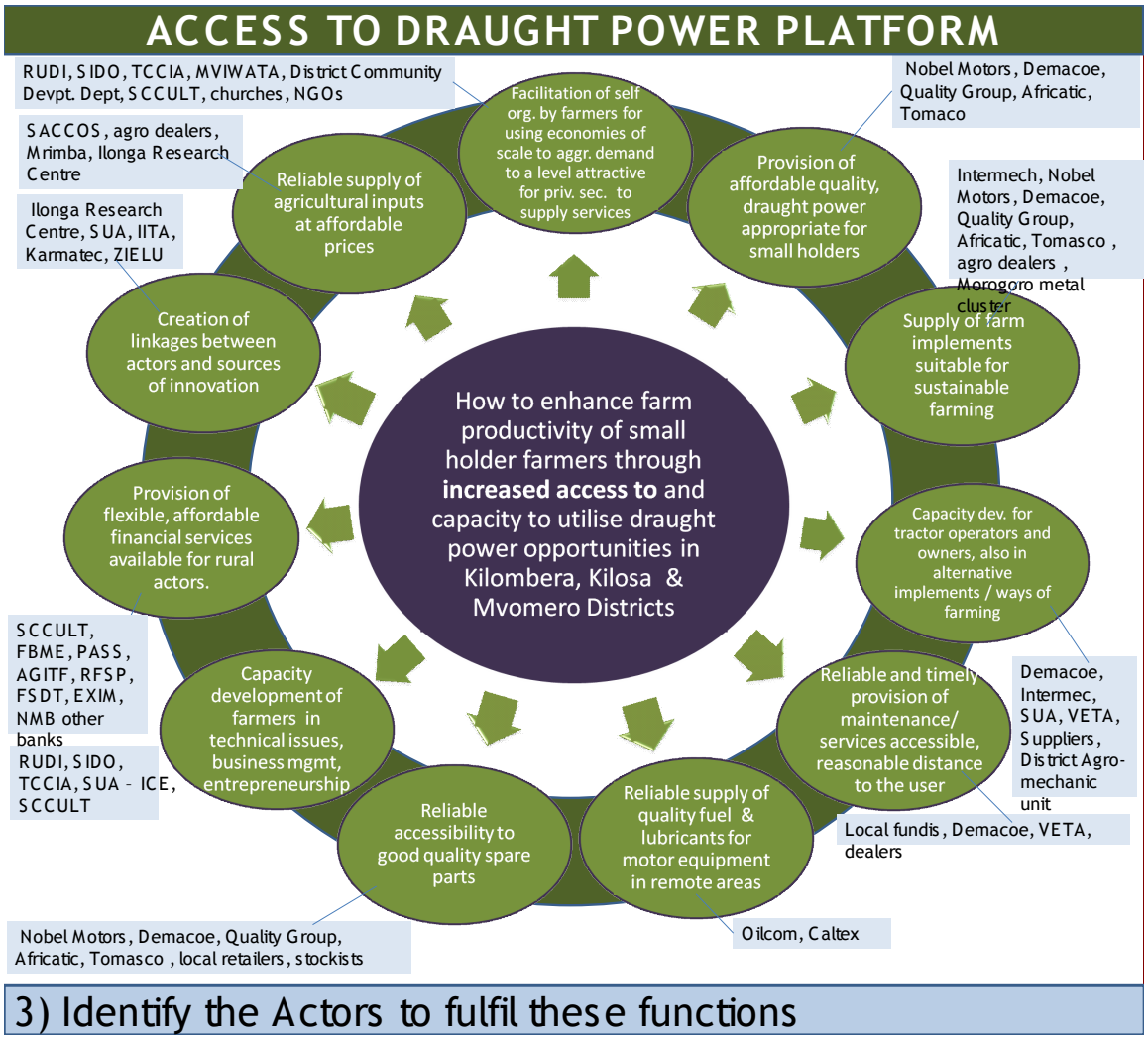
LIST OF ANNEXES

ANNEX 1: Actors in Draught power platform



ANNEX 2: List of people contacted

Ulanga district

#	Name	Position	Postal address/email	Tel. Number
1	Jackson Jakonia	Acting DALDO Ulanga	Box 3 Mahenge	0784 765121
2	Meya Akida	PADEP Representative	Box 3 Mahenge	0784 924021
3	Depo Nyamoro	Mechanization officer	Box 3 Mahenge	0784 639273
4	Mr Mitondo	Kireka SACOSS District rep	Mahenge	0782 163696
5	Ester Liyumba	Owner of fuel stations	Mahenge	0784 .....
6	St Getrude Swai	Kwiro garage	Box 42 Mahenge	0787 003682
7	Norman Gimbi	District Community Dev Officer	Mahenge	0784 604078
8	Pascal Kamota	Local fund at Lupiro	Lupiro garage	0782 347431
9	Aziz Ipambalaga	Rice farmer using power tiller	Minepa village	0785 634174
	Msafiri Daula	Innovative/progressive farmer	Itete - Njiwa	
	Yakubona Moses	Innovative/progressive farmer	Itete - Mianzini	0784 264931
	Luhombero processing	Innovative/progressive farmer	Mwaya	0783 427797
Kilombero district				
10	Rehema Madenge	DED Kilombero district	Ifakara Kibaoni	0784 424686
11	Mrs Kitua	DALDO Kilombero district	Ifakara DED office	0787 087725 023 262 5140
12	Mrs Marijani	District Horticulture specialist	Ifakara DED office	0784 429676
13	Mrs Hawa Ngapanya	Post-harvest	Ifakara DED office	0787 696953
14	Terry Kasena	Statistician	Ifakara DED office	0752 311596
15	Mercy Minja	Nutritionist	Ifakara DED office	0784 429840
16	Godfrey Mwembe	Acting Officer Incharge	Katrin Ifakara	0784 988989
17	Hassan Ally Mwegole	Local fundi (fabricate farm tools)	Kibaoni Ifakara	0784 683991
18	Elirehema Minja (teacher)	Owner - pare parts shop	Ifakara	0777 668242
19	Herri Abdiel Minja	Owner - spare parts shop	Ifakara	0784 429774 0777 429774
20	Madonni Kagambi	Owner - spare parts shop	Ifakara	0773 859272 023 262 5210
21	Ramesh Haridas (Manu)	Tractor owner/farmer	Ifakara	0784 833529
22	Walter Mwasha	Trained mechanic/farmer	Nido garage Ifakar	0784 820389 0774 820389
23	Victor Kileo	Technical Manager (MECO)	Mang'ula MMT	0784 402445
24	Maboga saguti	Administrative manager (MECO)	Mang'ula MMT	0787 532475
	Nkori Kibanda	Officer In charge	Katrin@iwayaafrica.com	0784 419520
	Kidaso	Owner of Tractors spare shop	Ifakara	0784 450060
Kilosa district				
25	Dr Jaochim Materu	DALDO Kilosa	DED Kilosa	0784 305627
26	Cathbert Milaho	DEO Kilosa	DED Kilosa	0784 245552
27	Mary Ng'unga	Post harvest	DED Kilosa	0784 450883
28	Helena Nyanda	Input supply	DED Kilosa	0783 836354
28	Anna Farahani	Seed multiplication (QDS)	DED Kilosa	0784 623163
30	Munga D.J.	Plant protection	DED Kilosa a	0784 587981
31	Valentino Mweji	OFSP	DED Kilosa	0784 658842
32	Donald Msongaya	Loan Off Maendeleo SACCOS	Kimamba	0784 789146
33	Willy D. Dikundile	Manger Maendeleo SACCOS	Kimamba	0787 604295
34	Hamis Issa Kayala	Board member '' SACCOS	Kimamba	0783 236813
35	Monica Lucas	Accountant '' SACCOS	Kimamba	0784 781324
36	China	Local tractor fundi	Kimamba	0784 517472
37	????? (Fake Festo)	Manufacture Ox-carts	Gairo	0764 588842
38	Mshelly Garage	Owner of the garage	Gairo	0784

39	Festo Mizengo Mzalendo	Fabricate farm tools	Gairo	0753 542305
	Yusuf Ally	Own tractor spare pasts shop	Morogoro	
	Ally Ndaki	Own tractor spare pasts shop	Morogoro	0784 390011
	Tasneem	Own tractor spare pasts shop	Morogoro	
Mvomero district				
40	Mrs Imelda Ishuza	DALDO Morogoro rural distr.	DED Mvomelo	0755 559949
41	Mr Hozariel Foya	DEO/PADEP	DED Mvomelo	0754 574692
42	Nicholas Mzava	Manager TULI SACCOS	Madizin Turiani	0784 406920 023 2625325
43	Daniel Chilosa	Member UWAKUDA	Cholima Research Institute	0754 688665
44	Iddi Ndaki	Own tractor spare shop/farmer	Morogoro	084 390011
45	Imma Metta	Own a tractor (Wakumima)	Morogoro	0784 432433
			Morogoro	
	Nahdi	Sell used spare parts	Morogoro	
	Nico	Sell used spare parts	Morogoro	