ENHANCING PRODUCTIVITY OF
UPLAND RICE ON STRIGA
INFESTED SOILS PROJECT

Context Analysis
For four villages in Kyela and two villages in
Matombo-Morogoro Rural Districts

Project Working Paper No. 2

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Natural Resources Institute

Crop Protection Programme
Striga species, the so-called witchweed, are widespread on the fields of small holder farmers in semi-arid areas of Eastern and Southern Africa. These noxious parasitic weeds principally attack and reduce the yield of finger millet, maize, sorghum and upland rice in these regions. In many areas it is the crops of resource-poor households that are affected by these weeds. In Tanzania upland rice is attacked by *S. asiatica* in a number of areas. Since 1996 staff from Ilonga Agricultural Research Institute and Sokoine University in Tanzania, and Natural Resources Institute in the UK have been collaborating with district agricultural extension in studies aimed at developing integrated Striga management practices for the rice crop. Studies have been undertaken with two groups of rice farmers in Kyela District located in the Southern Highlands agricultural zone. Through on-farm trials the farmers came to appreciate that Striga infestation and poor rice production are associated with indicators of low soil fertility. This in turn is a consequence of continuous rice cultivation in the absence of using any fertilizer or manure. While the trials demonstrated that up to a 60% reduction in Striga numbers and a 40% increase in rice yield could be achieved by using urea fertilizer farmers decided they did not wish to invest scarce cash in fertilizer. Instead they became interested in the opportunity, also observed from trials, to improve rice productivity on infested soils by introducing the green manure crop *Crotalaria*.

The current project “On-farm verification and promotion of green manure for enhancing upland rice productivity on Striga infested fields in Tanzania”, operating from October 2002 to March 2005, aims to scale up the demonstration of using the green manure in rotation with rice in both Kyela (Mbeya Region) and Matambo (Morogoro Region).

The purpose of this report is to present the findings from the context analysis conducted in four villages of Kyela and two villages in Matombo-Morogoro rural districts. This was to assist farmers understand their situation they are living in and to set strategies to alleviate the situation.

Further information on the project or further copies of this report are obtainable from:

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EXECUTIVE SUMMARY

This report contributes to output 2 of project R8194 namely; *On-farm verification and promotion of green manure for enhancing upland rice productivity on Striga infested fields.* It reports specifically on activity 2.1 identification of information needs for different stakeholders and 2.2 design of information strategies for different stakeholders.

**Objectives:**
The main objectives of the community context analysis were

► Analyze the situation in which farmers live and synthesize this information so that the participants have common understanding of their real situation.

► Collect baseline data to enable future evaluation of the project

► Plan for the future to improve livelihoods

► Develop a common understanding of the proposed green manure project.

Six separate villages, four in Kyela and two in Matombo-Morogoro rural district workshops were held in February 2003.

**Key political issues were**

Establishment of a multiparty system

Strengthening leadership to village level (Vitongoji)

Party activities have been separated from those of the government

Farmers and extension staff do not know most of the policy issues

The number of women taking leadership is negligible

**Key economic issues:**

Rice yields and maize (in Matombo) have declined from 20 bags to 1-2 bags per acre respectively

Free market economy

Removal of control posts within and outside the country

High input prices and low prices of agricultural produce

Land scarcity due to population pressure

Average land per household was estimated to be 2 acres

Limited marketing opportunities, dominated by middlemen, who offer very low prices

**Key social and traditional issues were**

High incidence of rice theft

Collective farming among social groups is no longer being practiced

Rice is used as food during celebrations

**Key environmental issues were**

Decline in soil fertility

Increase of *Striga* and *Ramphicarpa* (Kyela) problem

Drought and poor rainfall distribution during the season

Serious deforestation

Rivers have dried out

Wild animals have disappeared but in some villages destructive animals have increased - monkeys

1.0 **Introduction**
The context analysis was carried out in four villages in Kyela district and two villages in Matombo division that are participating in *Crotalaria* promotion project. The objective was to assist farmers understand their situation so that they can fully understand the challenge ahead of them and set strategies to alleviate the situation.

When and where:
25th – 28th January 2003 in four villages of Kyela
31st to 1st February 2003 in two villages of Matombo

**Facilitators:** Mr Patrick Lameck in collaboration with Dr A Mbwaga, Dr. G. Ley, Mr Kayeke and extension workers from the district council team

**General objective**
To carry out a context analysis of 4 villages in Kyela District and 2 villages in Matombo –Morogoro Rural District in order to assist farmers, ARI Ilonga and other stakeholders so that they can consolidate their efforts to improve rice production in the project area.

**Specific objectives**
- To identify with farmers (participating in *Striga* research) the real situation of the villages where they live.
- To enable farmers develop ownership of the research project.
- To expose to the farmers the real situation under which they are operating and which is usually not visualized by them.
- To have baseline data that can be used to evaluate the research programme to improve rice production.

**Participants**
Farmer research groups, Extension officers, Village government leaders, Researchers
2.0 Context analysis of target villages

For increased participation, cards to introduce individual participants were used. Participants included research group members, village leaders, extension workers and interested farmers
2.1 Kilasilo Village in Kyela District, Mbeya Region
Farmers have participated in research on Striga management in rice in Kilasilo since 1997. A strong farmer research group has developed, which has undertaken on-farm trials to observe the effect of using urea fertilizer on rice productivity on Striga infested fields. The first plots of Crotalaria were planted here in 2001. At the time of context analysis the group consisted of 7 women and 15 men.

2.1.1. Historical changes/Trends in relation to rice production in the target villages

a). Political;
- Multiparty system has improved democracy and freedom of expression of farmers and other stakeholders such as NGOs, institutions etc. Village councils have responsibilities adhered to and supported constitutionally, have been given more power by the central government through local government such as Village register book for village land ownership.
- Village government institutional capacity building by introduction of sub village (quarters) leadership for improved communication.
- Due to their low participation, women are encouraged to contest for the village government leaderships. This is happening slowly.
- National policies are still not known by villagers, leaders and some experts.

b). Economic situation:
- It is a state of free market economy,
- Rice is the major food and cash crop in the village.
- Prices are not stable and not attractive for farmers
- There is no market information among rural communities.
- There are fake agricultural inputs on the markets.
- Cross border trade is allowed
- Rice is a food and cash crop, but production is falling down year after year
- Higher prices of agricultural inputs; for example the current price of important inputs like Fertilizer (i). DAP 18000Tsh per 50kg bag enough for one acre, (ii). Urea 16000Tsh per 50kg bags enough for one acre, (iii) herbicide 2,4-D 1l for ¾ of an acre sold at 6000Ths per litre. However the production of rice is 1-2 bags per acre and sells at 12000 Tshs. to 18000 Tshs per bag. Hence cost of production cannot be justified; as result farmers do not buy agriculture inputs. Some years ago when the environment was good, one acre could produce up to 10 bags of rice per acre.
- The land under cultivation is not enough due to over population so the only option is to increase output per unit area.
• About 40% of the households have cattle, 2-3 heads per household and grazing is communal. However number of cattle was said to be increasing at a small rate and are mainly for providing draft power.

c). Cultural value of rice
• Rice is a special food during festivals, dowry paying and ceremony. 
  Land is distributed to older sons in a family.
• There is a slow trend of distributing land to daughters.

d). Social changes
• Farmers do invite others to assist in joint land cultivation.
• There is a limited extension services in the village. The existing 
  extension officer covers more than one village. This is too large area for 
  him to be efficient.
• There were IFAD services on savings and credits for the past two years 
  in the village but they didn’t help farmers to solve their rice-related problems. Farmers had to repay the credits at harvest time when the 
  price of rice was still very low.

e). Environmental changes:
• Increased plant pest *Striga* in upland rice and *Ramphicarpa fistulosa* in lowland rice. These have reduced to the great extent rice production in the last 10 years.
• Increased abundance of insect pests and diseases (e.g. Rice Yellow Mottle Virus).
• There is serious fertility depletion in farmer fields for rice production as a, result farmers have decided to change crops; increased growing of cassava as an alternative but not preferred crop
• There is a problem of weed infestation and emergence of new weeds (Minyaru) and destructive birds as a problem in rice.
• Rains are not reliable and unevenly distributed.
• Cutting of trees and bush clearing has caused wild animals to disappear from the village, as they prefer relatively thick bushes.

f). Gender-

<table>
<thead>
<tr>
<th>Activity in rice production</th>
<th>Done by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>Land preparation and cultivation</td>
<td>X</td>
</tr>
<tr>
<td>Planting</td>
<td>X</td>
</tr>
<tr>
<td>Weeding</td>
<td>X</td>
</tr>
<tr>
<td>Harvesting</td>
<td>X</td>
</tr>
<tr>
<td>Who owns the produce</td>
<td>X</td>
</tr>
</tbody>
</table>
Men own the rice enterprise and in case of divorce the woman is left without anything. This has an impact on rice production such as

- Stealing of grain from the store by women and it may happen also to men
- Women do not put effort to increase rice production and do not bother even to train children on rice production. Women are known to be good teachers of the family.
- Dividing plots between husband and a wife to ensure proper use of produce at the household level. Although husbands take a lion share of the plots and the produce their expenditure is unknown to family issues. Income from women’s plots takes care of domestic and children issues.

### 2.1.2 Farmer Potentials to Grow Rice;

**a). Strength**

These include things that farmers have at their disposal and are making use in rice production. These are;

- Land is available but not considered to be sufficient
- Farmers have oxen and ox-ploughs and there still some farmers use hand hoe for cultivation.
- Human power (healthier - question of reduced manpower due to HIV) and indigenous knowledge.
- Experiences from fore fathers and from other sources
- Local and traditional varieties of rice.

**b). Opportunities**

In this context these are resources that are at farmer’s disposal but farmers are not using them (for reasons best known to themselves) and they posses the capacity to use them.

- Animal manure is available in limited quantities but not used.
- *Crotalaria* is also available.
- The knowledge of *Striga* and *Ramphicarpa* is available to farmers who have already participated in a farmer research group.
- Some farmers are participating in *Crotalaria* Research
- District Agriculture office is available to offer extension services.
- Village government support rice production
- Farmers are free to seek and choose the market that gives them better prices.
- Kyela Rice is of high quality and is highly preferred by consumers nationally.

**c). Weaknesses;**

These are limitations that farmers can solve but they are not willing to do so for reasons best known to them selves. These include;
• Farmers ignore better agricultural practices and technologies, which they have been taught since colonial era.
• Farmers do not look for market information
• Farmers do not take, keep and make use of data from their actions.
• They don’t look for agriculture information on rice production at various sources such as District Council.
• There is mistrust within the family resulting in misuse of income from rice produce.

d). Threats
These are natural calamities that are beyond farmer’s control. They are at the back of farmer’s minds because they increase risk in farming. These include;
• Unreliable, unpredictable and unevenly distributed rains.
• Existence of parasitic plant Striga with threatening characteristics of a high rate of seeding and seed viability up to 20 years.
• Quelea quelea, insect pests and diseases outbreaks

2.1.3 Farmers’ experiences in growing rice

a). Achievements from rice production
Part of income from rice production has contributed for farmers to buy cows, bicycles, clothes, pay for school education up to form IV (Secondary education) and to buy agricultural inputs. They sometimes use this income for dowry, and capital for petty business. Rice also ensures household food security and good relationship with neighbours who are invited for collective meals.

b). Problems facing farmers in rice production
• There are few Extension officers
• Low market price for rice accompanied by high production costs.
• There are outbreaks of birds, diseases and pests
• Prices of agric inputs are high so profits are very low
• Agricultural input stockists sell fake products (e.g. herbicides and fertilizers)
• The fields are infested with parasitic weeds-Striga and Ramphicarpa
• There is poor or no record keeping
• Depleted soil fertility
• Limited land for cultivation
• Very low rice yields
• There is no source for improved seed

c). How farmers have solved the problems
• They have formed research groups to investigate on agriculture related problems including those of Striga and other rice weeds.
• Calling extension officers from the district councils for assistance.
• Farmer to farmer learning. Farmers share and exchange experiences among them selves.
• Look for market information only at village level.
• To use available agricultural services and make use of indigenous knowledge and available technologies.
• To conduct research, collect results and keep record for evaluation
• Look for agricultural information
• Grow Crotalaria and use animal manure to improve soil fertility to increase rice productivity

2.1.4 Experts and outside experiences
Training on Striga has been conducted in the village as well as trials on Striga control options. Farmers were advised to;
• be creative, and learn from research conducted
• utilise the opportunity of having researchers in the village
• Use the knowledge acquired on Striga control.
• Women are encouraged to participate in research activities and make contribution at workshops
• form and enforce bye-laws in collaboration with village government to improve rice production

2.1.5 Identification and deepening of Key issues.
From the workshop analysis findings were analysed and summarised into the following key issues and root causes were brainstormed thus:
Before this analysis
1. Farmers did not know the real situation of their village that affected their rice production.
2. Farmers’ did not know that Striga and Ramphicarpa infestations have reduced upland rice production from 10 to 2 bags of rice per acre.
3. The farmers, who are members of the farmer research group were not keen on doing their experiments on their own but depended on data collected by the group secretary and explanation made by their chairman.

From this analysis all farmers agreed start to focus on and developed the following challenge:

Farmers of Kilasilo village want to improve rice production from 2 to 10 bags/acre, while conserving the environment by complete eradication of Striga and Ramphicarpa at lowest costs by using locally available resources through research.
2.1.6 Strategies:

From the three identified key issues, farmer drew up the following strategies (see the table below);

<table>
<thead>
<tr>
<th>Key issues no.</th>
<th>What to be done</th>
<th>How to be done</th>
<th>By whom</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Educate other farmers</td>
<td>By teaching at any gathering (formal/informal)</td>
<td>All this workshop participants</td>
<td>From 25th January 2003</td>
</tr>
<tr>
<td>2</td>
<td>Create a habit of keeping records</td>
<td>Everyone must buy a pen and a copy book</td>
<td>All this workshop participants</td>
<td>From 25th January 2003</td>
</tr>
<tr>
<td>3</td>
<td>Farmers should understand and be ready to explain what he/she is doing in Striga research</td>
<td>Those who don’t know they must learn from others immediately</td>
<td>Those who don’t know</td>
<td>By 28th February, 2003</td>
</tr>
</tbody>
</table>

2.1.7 Institutional analysis:

2.1.7.1 List of stakeholders working in the area

<table>
<thead>
<tr>
<th>Found within the village</th>
<th>Found outside the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Primary cooperative Ikolo</td>
<td>I. Outside middlemen such as Mohamed Enterprises, Fride Husein etc.</td>
</tr>
<tr>
<td>II. Village government</td>
<td>II. Village extension worker VEW.</td>
</tr>
<tr>
<td>III. Primary school</td>
<td>III. ARI Uyole</td>
</tr>
<tr>
<td>IV. Churches</td>
<td>IV. ARI Ilonga</td>
</tr>
<tr>
<td>V. Dispensaries</td>
<td>V. KYERUCU District Cooperative union</td>
</tr>
<tr>
<td>VI. Middlemen</td>
<td>VI. Sokoine University of Agriculture (SUA).</td>
</tr>
<tr>
<td>XV. Police station Boda</td>
<td>XV. Police station Boda</td>
</tr>
<tr>
<td>XVI. Mosque Boda</td>
<td>XVI. Police station Boda</td>
</tr>
</tbody>
</table>

2.1.7.2 Services rendered by these institutions:

I. Primary co-operative Ikolo; *Buys rice and cashew nuts*

II. Village government; *Rule and governs the village*

III. Churches; *Provide spiritual services*

IV. Dispensaries; *Provide cure, prevention and education on health services*

V. Middlemen; *Buy farmer’s produce but at a very low price*

VI. Outside middlemen such as Mohamed Enterprises, Fride Husein etc; *Buy farmer’s produce at a very low price*
VII. Village agricultural extension officer: *Provide agric. extension services and advisory*

VIII. ARI Uyole; *Sensitise farmers on use of industrial and burnt rice husks fertilizers*

IX. ARI Ilonga; *Facilitate farmers to conduct research on improvement of soil fertility and control of striga*

X. KYERUCU (District Co-operative union); *Sells agriculture inputs on loan and buys farmer’s agricultural produce*

XI. Sokoine University of Agriculture (SUA). *Conducted one farmer study tour to Mbarali and Mandibila irrigation sites*

XII. Kikusya rice trial site: *Screens and evaluates rice varieties and conduct other agronomic trials on rice*

XIII. District Council (DALDOs Office) *Offers agricultural advisory services & coordinate all agricultural activities*

XIV. Police station at Boda: *Ensure peace by enforcing laws and regulations*

XV. Primary court at Busale: *Provide rights to farmers*

XVI. Mosque at Boda: *Provide spiritual services*

2.1.7.3 Analysis of the Stake holders

In this exercise farmers gathered together to analyse all the institutions mentioned above. Venn diagram was used for analysis, where circles indicated institutions.

- Big circles showed institutions that are most important to the farmer researcher groups.
- Middle sized circles showed those institutions that are of average importance to them.
- The small circles showed that the institutions were of less importance to the group.
- The Black dot at the centre formed the centre of the farmer research group. If an institution has close relationship with the farmer researcher group was placed closer to the centre and then the distance increased from the centre with decrease in relationship. The poorest relationship was placed very far away from the centre of the research group.

2.1.7.4 The Venn diagram developed by Kibalu Farmer Research Group.
ARI Ilonga INADES Formation Tanzania

Form the Venn diagram;

- Those institutions found very far have poor relationship with the farmer researcher group. For example they see SUA vehicles working with farmers, but they are not aware of what they are dealing with that is why farmers had poor or no relation ship with farmers.
- External middlemen are of poor importance to the researcher farmer group (given smaller circle) since they offer poor prices and have poor relationship as they see them coming to buy their crop at a very low prices and provides no marketing information hence exploit them (Placed very far from the farmer group).
- ARI Ilonga is very important to these farmers (Bigger circle) as it facilitates them to research on striga eradication and soil fertility improvement for their improved livelihood. The see them coming most frequent and they appreciate what they are doing (Placed closer to the farmer group).
- Kikusya trial site (located 12 km from the farmer research group) was found to be very important to these farmers (Bigger circle) because they need improved rice seed, but farmers were not aware of what the centre was doing.

2.2 Itope Village in Kyela District, Mbeya Region

Farmer participation in research on management of Striga began in Itope in 1998. On-farm trials on use of urea have been undertaken in this village. At the time of this context analysis the farmer research group in the village consisted of 9 men 3 women. The context analysis was undertaken with one group of men and women working using cards, brainstorming and deepening discussions.

2.2.1 Historical changes

a). Political –

b) Multiparty system has improved democracy and freedom of expression by farmers and other stakeholders such as NGOs, institutions etc.

- Public services are no longer free, due to the introduction of cost sharing. Trend is for farmers to bear all public services at costs.
- Village government institutional capacity building by reinforcing sub village (quarters) leadership for improved communication.
- There is low participation of women in the village government leadership
- National policies are not known by villagers, leaders and some experts.
- Splitting of ruling party leadership from government leadership has led to minimise interference in local government for roles and responsibilities. There is a Village government chairman and party Village Chairman for the ruling party to deal with mainly political issues.
**b). Economic situation**
Rice is the major food and cash crop in the village. However the following economic situations were identified
- Free market economy,
- Prices are not stable, there is no marketing point, which is not good for farmers
- There are number of middlemen, who set buying prices
- There is no market information among rural communities.
- There are fake agriculture inputs on the markets.
- Cross border trade in Malawi is allowed
- Rice is a food and cash crop, but production is falling season after season, cassava is replacing rice.
- Higher prices of agricultural inputs; for example the current price of following input like fertilizer (i). DAP 18000 Tsh per 50kg bag enough for one acre, (ii). Urea 16000 Tsh per 50kg bag enough for one, (iii) herbicide 2,4D 11 for ¾ of an acre sold at 6000 Tshs per litre. But the production of rice is 1-2 bags per acre and sells at 12000 Tshs. per bag to 18000 Tshs. Cost of production cannot be justified so farmers do not buy agriculture inputs. In the past when the environment was good one acre of rice could produce up to 10 bags of rice. However today rice production has decreased by 80%.
- The land under cultivation is insufficient due to over population; an option is to increase output per unit area.
- About 40% of the households have cattle, 2-3 heads per household and grazing is communal.
- About 50% of the households cultivate their rice fields using ox-plough

**c). Cultural value of rice**
Rice is the special food during festivals and dowry paying ceremonies.

**d). Social changes**
- Farmers do invite others to assist in fieldwork like cultivation, weeding and harvesting, but the spirit of working together is lessening due to the reduced yields obtained.
- Limited extension services in agriculture especially for crop production.
- An IFAD project provided loans for agriculture inputs to farmers. Because farmers had to pay back the loan immediately after harvest when the prices of rice are, few were interested to use the loans.
- There is a lot of rice theft in the village due to scarcity of the crop.

**e). Environmental changes**
- Rains are very unreliable. There is increased incidence today of floods and drought.
• Insect pests and diseases are increasing.
• There is fertility depletion in farmers’ fields and increase in *Striga*
• Livestock keeping has increased but number of heads per household has decreased
• Cutting trees and bush clearing for farm and houses has caused wild animals to move far away from the village

**f). Gender**

<table>
<thead>
<tr>
<th>No</th>
<th>Activity in rice production</th>
<th>Done by</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
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<tr>
<td>1</td>
<td>Land preparation and cultivation</td>
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<tr>
<td>2</td>
<td>Planting</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Weeding</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Harvesting</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Who owns the produce</td>
<td>X</td>
</tr>
</tbody>
</table>

**2.2.2 Farmer Potentials to Grow Rice**

**a). Strength**
- There are ox-ploughs and hand hoes, some households make use of hired labour
- Seeds of local rice varieties are collected from previous harvest and used as seed.
- Manpower (muscle power)
- Experiences from forefathers and other sources.
- Indigenous knowledge and technologies are available

**d). Opportunities**
That are available at farmers disposal but are not used
- Animal manure.
- Extension officers (consultation is made on livestock only and none for crops).
- Researchers who conduct trials in their villages.
- There is a research station field at Kikusya in a nearby village conducting trials on rice varieties. None of the farmers was aware of what is being researched there.
- Market information is available through radio, various leaflets and newsletters.
- There is a Farmers Research Group in the village.
- Kyela Rice is of high quality
- Village government and District authorities support rice production
c). Weaknesses
- Late land preparation and cultivation that delays following activities.
- Ignoring better agricultural practices they have learned since colonial times such as deep tillage, contours etc.
- Lack of searching for agriculture and marketing information on rice.
- There is mistrust within the family to misuse the little income they get from rice production.

d). Threats.
- Unreliable and unpredictable rains.
- Frequent floods
- High rate of seeding and long seed viability of *Striga* is making it difficult to eradicate, farmers rotate with crops like cassava for severe infested soils.
- *Quelea quelea*, insect pests

2.2.3 Farmers experiences

a) Achievements
Rice production has enabled farmers to buy cows bicycles, clothes, and pay for education up to secondary school level in government schools. Farmers also buy agricultural inputs from selling rice. They sometime use it for paying dowry and building better houses. Rice also ensures household food security and good relationship with neighbours.

b). Problems facing farmers and how they solved them
- Weed problem is increasing. Solution has been hand weeding up to 3 times per season. Some few farmers from the project make use of *Crotalaria* to reduce the weed pressure in following rice crop.
- There are few Extension officers
- Poor market prices. Middlemen use this opportunity to set low prices at farm level.
- Outbreaks of birds, diseases and pests. Farmers have been setting traps, use chemicals and indigenous knowledge such as medicinal plants
- Prices of agric inputs are high. Making use of locally available resources such as hand hoe, local seeds and medicinal plants
- The fields infested with *Striga* are increasing. Formed research groups to conduct trials and at the end of the day make use of results.
- There is poor or no record keeping. Farmers need to use Research findings and keep records
- Poor soil fertility. Farmers have been doing nothing

2.2.4 Researchers’ experiences
Training on Striga has been conducted in the village and control measures described. Farmers were advised to;
(ii) Be creative, and learn from research conducted in the village.
(iii) Not to despair because it looks like that farmers have despaired to improve the reduced rice production.
(iv) make use the Striga knowledge they have learned.

### 2.2.5 Identification and deepening of Key issues

From the workshop analysis of the situation above, findings were analysed and summarised into the following key issues.

1. Farmers did not know the real situation of their village that affected rice production.
2. Before this analysis farmers’ did not know that upland rice production has been reduced by Striga infestations from 10 to 2 bags per acre.
3. Farmers who are members of Farmer Research Group were not keen in carrying out their research work thus depending much on data collected by the group secretary and explanation made by their secretary.

From this all participating farmers agreed to start awakening and developed the following challenge:

**Farmers of Itope village want to improve rice production from 3 to 20 bags per acre while improving soil fertility by complete eradication of Striga at lowest possible costs by using locally available resources through research.**

### 2.2.6 Strategies

<table>
<thead>
<tr>
<th>Key Issue no.</th>
<th>What to be done</th>
<th>How will it be done</th>
<th>By whom</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Train and sensitise all other farmers</td>
<td>Making use of formal and informal villagers gathering</td>
<td>All this workshop participants</td>
<td>From 26th January 2003</td>
</tr>
<tr>
<td>2</td>
<td>Farmers to collect keep and use records after analysis</td>
<td>Everyone must buy a pen and a copy book</td>
<td>All this workshop participants</td>
<td>From 26th January 2003</td>
</tr>
<tr>
<td>3</td>
<td>Every farmer must understand and be ready to explain what he/she is doing in their research</td>
<td>Those who don’t understand to learn from those who understood</td>
<td>Those who don’t understand</td>
<td>By 26th February, 2003</td>
</tr>
</tbody>
</table>

### 2.2.7.0 Institutional analysis

The farmer researcher group is called Kilambo, and Institutions working/available in the area are listed below.
2.2.7.1 List of institutions working in the area

<table>
<thead>
<tr>
<th>Found within the village</th>
<th>Found outside the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Village government</td>
<td>I. District Hospital</td>
</tr>
<tr>
<td>II. Churches</td>
<td>II. Police station Kyela</td>
</tr>
<tr>
<td>III. Primary school Itope</td>
<td>III. Primary court Busale</td>
</tr>
<tr>
<td>IV. Secondary school Itope</td>
<td>IV. Village extension worker VEW.</td>
</tr>
<tr>
<td>V. Dispensaries</td>
<td>V. District Council (DALDOs Office)</td>
</tr>
<tr>
<td>VI. Football team</td>
<td>VI. Kikusya rice seed research</td>
</tr>
<tr>
<td>VII. Pombe shop Tupendane</td>
<td>VII. ARI Ilonga</td>
</tr>
<tr>
<td>VIII. Internal middlemen</td>
<td>VIII. ARI Uyole</td>
</tr>
<tr>
<td></td>
<td>IX. Outside middlemen such as , Norman, Bionet Frida Hussein</td>
</tr>
<tr>
<td></td>
<td>X. KYERUCU District Cooperative union</td>
</tr>
</tbody>
</table>

2.2.7.2 The services rendered by these institutions:

I. Village government; *Rule and governance*

II. Churches; *Provide spiritual services*

III. Primary School Itope; *Provide primary school education to their children.*

IV. Secondary school Itope; *Provide secondary school education to their children.*

V. Dispensaries; *Provide cure, prevention and education on health services*

VI. Football team; *Recreation and physical exercise for youth*

VII. Pombe shop turpentine; *Taking local brew, selling and buying small commodities*

VIII. Internal middlemen; *Buy farmer’s produce at a very low price*

IX. District Hospital Kyela; *Provide cure, prevention and education on health services*

X. Police station Kyela; *Ensure peace by enforcing laws and regulations*

XI. Primary court Busale; *Provide rights to farmers*

XII. Village agricultural extension officer (VEO). *Provide agric extension advisory service*

XIII. District Council (DALDOs Office); *Offers agricultural advisory services & coordinate all agriculture activities*

XIV. Kikusya rice trial site: *Screens rice varieties and conduct evaluation and agronomic trials.*

XV. ARI Ilonga; *Facilitate farmer to conduct research on improve soil fertility and hence eradicate striga*

XVI. ARI Uyole; *Sensitise farmer on the use of industrial and burn rice husks fertilizers*

XVII. Outside middlemen such as Mohamed Enterprises, Fride Husein etc. *Buy farmers agricultural produce.*

XVIII. KYERUCU District Cooperative union; *Sells agriculture inputs on loan and buys farmers crop produce.*
2.3 Konjula Village in Kyela District, Mbeya Region.

A group is being formed here to conduct Striga control demonstration plots for the first time. The group composition is 11 men and one woman.

2.3 1 Historical changes

a). Political
- Multiparty system; this has improved democracy and freedom of expression among farmers.
• Public services are no longer free.
• More emphasis has been to sub village leadership to improve village communication.
• There is low participation of women in the village government leadership despite of being encouraged.
• Development policies are still not known by villagers and most experts.
• Separating government role and responsibilities from those of the ruling party e.g. Previous the village chairman was holding two posts as the village government chairperson and Village political party Chairperson. Now there are two Chairpersons one for the government and the other for the ruling party.

b). Economic Situation.
• Free market economy from controlled market system,
• Co-operative unions are diminishing.
• Rice prices are going down year after year
• Higher prices of agricultural inputs yet inputs are below standard and in most cases inputs are not available at village level.
• Cross border trade is allowed
• Rice production has dropped from 20 to 3 bags per acre over the past 20 years.
• Population of the village is 465 households with an average acreage of 3 acres per household with one acre under rice production.
• 80% of the house holds own local cattle of 2 heads mostly used as animal power for land cultivation.
• Land is limited hence so it is difficult to ensure family food security.

c). Cultural Value of rice.
• Rice is the special food during festivals
• There are special dances after harvesting. Traditional Ngoma groups are invited from neighbouring villages and Malawi to cerebrate harvests
• After harvesting there are more visitors (far relatives and middlemen) because there is plenty of food in the village.

•

d). Social
• Availability of rice in a household strengthens good neighbourhoods. During lunch, neighbouring families bring food (rice) and eat together.
• Extension officers do not attend to farmer’s agricultural problems.
• There is a lot of theft of rice in the village.

e). Environmental issues.
• Water depth in rivers has been reduced due to siltation
• Some people are cultivating along riverbanks
• Rains are very unreliable hence increased incidence of drought and floods.
• Insect pests and diseases are also increasing.
• There is tremendous fertility depletion in farmers’ fields, which has resulted in increased *Striga* infestation.
• Livestock keeping has increase but number of herds per household has decreased
• Cutting trees and bush clearing for charcoal and firewood has increased. Wild animals are disappearing and microclimate has changed to more droughts.
• There is an increase in weed infestation in rice fields

**f). Gender**

<table>
<thead>
<tr>
<th>No</th>
<th>Activity in rice production</th>
<th>Done by</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Land preparation and cultivation</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Planting</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Weeding</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Harvesting</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Who owns the produce</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>

From the above table, it shows that the final product of rice becomes the property of men. This discourages women from making an effort to improve rice production.

**2.3.2 Farmer Potentials to Grow Rice**

**a). Strength**
- There are ox-ploughs and hand hoes in the village
- Seed is collected from previous harvest i.e. farmers recycle their own seed
- Muscular power is available
- Health
- Experiences in growing rice
- Indigenous knowledge and technology for growing rice is available

**b). Opportunities**
These are opportunities, which are available to farmers.
- Animal manure
- *Striga* knowledge
- Existing extension officers although not living in the village
- *Crotalaria* is available
• Researchers running trials in the area.
• There is a research trial site at Kikusya, nearby village where trials evaluating different varieties of rice are undertaken.
• Farmers Research Group was recently formed in the village to undertake demonstration plots
• Kyela Rice is of high quality and is in high demand else where in Tanzania and export.
• Village government and District authorities support rice production.

c). Weaknesses
• Time is wasted on leisure such as local brew and traditional dances
• Misuse of resources in the household
• Ignoring better agriculture practices learned since colonial times.
• Lack of searching for agriculture information.
• Traditional beliefs and cultures that are detrimental to rice production
  For example use of farmyard manure is believed to increase rice weeds and labour for weeding.

d). Threats to rice production
• Floods from rivers in the village and fields
• Striga
• Quelea quelea, insect pests and vermin’s

2.3.3 Farmers experiences in growing rice

a). Achievements
Rice production has contributed farmers to buy livestock, bicycles, clothes, pay for education up to Form IV in government schools. They sometimes use it to pay dowry, and building better houses. Rice also ensures household food security and good relationship with neighbours.

b). Problems facing farmers and how they have been solving them.
• Increasing weeds of rice. Solution has been hand weeding and few farmers have used herbicides.
• Striga infestation
• Depletion of soil fertility. A possible solution is the use of Crotalaria to improve soil fertility; hence the formation of the group to try this practice on demo plots.
• Higher prices of agricultural inputs, there was no any ideas of how they have been to solving the problem.
• Low price of rice, there was no any ides of how to solve the problem.
• Unavailability of agriculture information.
2.3.4 Researchers’ experiences.
Training on Striga biology and control options was conducted at all village workshops during January 2003. Further farmers were advised as follows;
- There are opportunities, which are not yet tapped; farmers are advised to start making use of them.
- Farmers are not keeping records so they should keep and make use of data of their activities.
- Farmers must be creative

2.3.5 Key issues
From the workshop analysis of the situation above, findings were analysed and summarised into the following key issues;

1. Farmers did not know the real situation of their village that affected rice production.
2. Before the context analysis farmers’ were not aware that upland rice production has been reduced by Striga infestations from 10 to 2 bags per acre.
3. Farmers of Njugilo village have no culture of taking, keeping, analysing and make use of data from their actions. Hence, they are unable to detect changes in rice production due to different practices.

From this the farmers developed the following challenge:

Farmers of Konjula village wants to improve rice production from 3 to 20 bags/acre while conserving their environment by complete eradication of Striga and improving soil fertility through research.

2.3.6 Strategies

<table>
<thead>
<tr>
<th>Key issue no.</th>
<th>What to be done</th>
<th>How to be done</th>
<th>By whom</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Train all other farmers in the village</td>
<td>By making use of formal and informal gathering.</td>
<td>All this workshop participants</td>
<td>From 27th January 2003</td>
</tr>
<tr>
<td>2</td>
<td>Collect, keep and analyse data while making use of results.</td>
<td>Farmers to have an exercise book, pen and a rural to record necessary data</td>
<td>All this workshop participants</td>
<td>From 27th January 2003</td>
</tr>
</tbody>
</table>
2.3.7.0 Institutional analysis
Institutions working/available in the area are as presented in the table below.

2.3.7.1 List of institutions operating in the area

<table>
<thead>
<tr>
<th>Found within the village</th>
<th>Found outside the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Churches</td>
<td>I. District Council (DALDOs Office)</td>
</tr>
<tr>
<td>II. Primary school Njugilo</td>
<td>II. KYERUCU District Cooperative union</td>
</tr>
<tr>
<td>III. Dispensaries</td>
<td>III. Itope Sec School.</td>
</tr>
<tr>
<td>IV. BIOLAND</td>
<td>IV. ARI Ilonga</td>
</tr>
<tr>
<td>V. Village government</td>
<td>V. Police station Kyela</td>
</tr>
<tr>
<td>VI. Ward Extension Worker WEW</td>
<td>VI. Primary court Busale and lusongo</td>
</tr>
<tr>
<td>VII. Traditional ngoma (Kaole and kapela)</td>
<td>VII. Outside middlemen such as , BIONET, Mohamed enterprises Fride Husein etc.</td>
</tr>
<tr>
<td>VIII. Football team</td>
<td>VIII. Kikusya rice seed research</td>
</tr>
<tr>
<td>IX. Internal middlemen</td>
<td>IX. District Hospital Kyela</td>
</tr>
<tr>
<td>X. Ipande Primary cooperative society</td>
<td>X. ARI Uyole</td>
</tr>
<tr>
<td>XI. Pombe shop Konjula</td>
<td></td>
</tr>
</tbody>
</table>

2.3.7.2 Services rendered by these institutions:

I. Churches; Provide spiritual services
II. Primary school Njugilo; Provide primary school education to children
III. Dispensaries; Provide cure, prevention and education on health services
IV. BIOLAND; Buys farmer produce at a very low price
V. Village government; Rule and governs the village
VI. Ward extension worker WEW; Provide agric extension advisory
VII. Traditional ngoma; For recreation and unite farmers from neighbouring villages and neighbouring country Malawi
VIII. Football team; Recreation and physical exercise for youth
IX. Internal middlemen; Buys farmer produce at a very low price
X. Primary cooperative society Ipande; Buys rice and cashew nuts
XI. Pombe shop Konjula; Taking local brew, selling and buying small commodities
XII. District Council (DALDOs Office); Offers agricultural advisory services & coordinate agriculture activities
XIII. KYERUCU District Cooperative union; Sells agriculture inputs on loan and buys farmer produced crops
XIV. Secondary school Itope; Educate their children on secondary school education
XV. ARI Ilonga; Facilitate farmer to conduct research to eradicate striga
XVI. Police station Kyela; Ensure peace by enforcing laws and regulations
XVII. Primary court Busale; Provide rights to farmers
XVIII. Outside middlemen such as Mohamed Enterprises Fride Husein etc. Buys farmer produce at a very low price
XIX. Kikusya rice seed research; Screens rice seed varieties and research
XX. District Hospital Kyela; Provide cure, prevention and education on health services
XXI. ARI Uyole; Sensitise farmer on use of industrial and burn rice husks fertilizers
2.3.7.3 The Venn diagram developed by Konjula researcher farmer group.
2.4 Sinyanga Village in Kyela District, Mbeya Region

This village joined the Striga project for the season 2002/03. The group has a total number of 12 members with 2 of them being women. Training on Striga biology and control measures was conducted in November 2002 when the Farmer Research Group was formed.

2.4.1 Historical changes

a). Political
- Multiparty system; this has improved democracy and freedom of expression
- Village leadership has been strengthened by having sub-village leaders
- There is low participation of women in the village government leadership
- The society is not aware of the national policies
- The party and government responsibilities have been separated

b). Economical situation
- Free market economy
- Prices of agricultural products have dropped
- Rice is the main food and cash crop in the village.
- Rice production has dropped from 20 to 5 bags per acre over the past 20 years.
- High prices of agricultural inputs
- The land under cultivation for each household is getting smaller due to population growth. There is an average of 2 to 5 acre per household
- In the household of 7-8 members consuming approximate 10 bags of rice per year
- About 75% of the households own an ox-plough and oxen
- The total number of households in the village is 375.
- Cross border trade is allowed with Malawi.

c). Cultural value of rice:
- Rice is the special food during festivals and is sometimes used as dowry,
- There are a number of festivals after rice harvesting
- Women are not free to use the rice in a household because the rice harvest belong the man

d). Social
- Cultivation used to be done collectively. This has now changed due to increased cost of food and poor yield of rice.
• Sales of agriculture input has been privatised, prices are higher than in the past.
• Farmers are not aware of the importance of Extension officers
• There is a lot of theft of rice in the village

g). Environmental changes.
• Rains have become very unreliable
• There are rills and gullies formed due to soil erosion
• *Striga* and other weeds are increasing
• There is fertility depletion in farmers’ fields hence increase in *Striga* infestation
• Cutting trees and bush clearing for firewood, charcoal and houses have caused wild animals to move away from the village and changed the microclimate to reduced rainfall amount.
• There has been an increases in attacks on rice by birds, vermin, tortoises, occasionally army worm and long-horned grasshopper and white grabs

f). Gender responsibility-

<table>
<thead>
<tr>
<th>No</th>
<th>Activity in rice production</th>
<th>Done by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>1</td>
<td>Land preparation and cultivation</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Planting</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Weeding</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Harvesting</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Who owns the produce</td>
<td>X</td>
</tr>
</tbody>
</table>

Cultivation is done by men, weeding by women, harvesting together but the products belongs to men. At the same time female are not allowed to talk before men. The conditions are not conducive for women to promote increase in rice production.

2.4.2 Farmer Potentials to Grow Rice

a). Strength available:
• Oxen and ox-plough
• Hand hoes
• Limited land.
• Own recycled seed collected from previous harvest
• Animal manure
• Health people
• Muscular power.
b). **Opportunities**
Those are available at farmer’s exposure
- Rivers (Can be used for vegetable irrigation)
- Animal manure
- Extension officers.
- Researchers are available
- There is a research trial site at Kikusya nearby village, conducting rice variety trials.
- Kyela Rice is in high demanded due to its aromatic taste
- Village government and District authorities support rice production

c). **Weaknesses**
- Delay in land preparation
- Poor practice of agriculture technologies
- Farmers don’t look for agricultural information
- There is mistrust within the family

d). **Threats to rice production**
- Increased draught.
- Frequent floods.
- Increased infestation of the fields by *Striga*.
- Increased rice diseases.

2.4.3 **Farmers experiences-success**

a). **Achievements**
Rice production has contributed for farmers to buy cows, bicycles, clothes, paying school fees for education up to Form VI in government schools. Buy agricultural inputs. They sometimes use it for dowry, and building better houses. Rice also ensures household food security and good relationship with neighbours.

b). **Problems and how they solved them**
- Weed problem is increasing and is being solved by hand weeding 3 times per season
- Outbreaks of birds, diseases, weeds and pests.
- Prices of agricultural inputs are higher and no solution was suggested.
- The fields infested with *Striga* are increasing. Farmer recently formed a research group on Striga. So far solution was hand weeding.
- There is poor or no record keeping among farmers and no solution was suggested.
- Poor soil fertility no solution was suggested, however recently a group was formed to start growing Crotalaria.
2.4.4 Researchers’ experiences
Training on Striga control was conducted in the village in November 2002.

2.4.5 Key issues

From the workshop analysis of the situation above, findings were analysed and summarised into the following key issues:

1. Farmers did not know the real situation of their village that affected rice production.
2. Through discussion farmers’ have come to know that their upland rice production has been reduced by *Striga* infestation from 20 to 5 bags of rice per acre.
3. Farmers of Sinyanga village have been depending on resources from outside, which they cannot afford.
4. The farmers are working without making realistic plans and they don’t keep records of their agricultural activities.

*From this analysis all farmers agreed to start awakening and they developed the following challenge:

*Farmers of Sinyanga village want to improve rice production from 5 to 20 bags/acre while improving soil fertility by complete eradication of Striga and improving soil fertility through research.*

2.4.6 Strategies

<table>
<thead>
<tr>
<th>Key issue no.</th>
<th>What to be done</th>
<th>How to be done</th>
<th>By whom</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Train and sensitise other farmers</td>
<td>By use of formal and informal gathering</td>
<td>All this workshop participants</td>
<td>From 28th January 2003</td>
</tr>
<tr>
<td>2</td>
<td>Improve rice production</td>
<td>Improve soil fertility by animal manure, <em>Crotalaria</em> and carry research</td>
<td>All this workshop participants</td>
<td>From 28th January 2003</td>
</tr>
<tr>
<td>3</td>
<td>Farmers must change to be creative</td>
<td>They have to use available resources Education farmer to farmer Follow up on information</td>
<td>All this workshop participants</td>
<td>By 28th February, 2003</td>
</tr>
<tr>
<td>4</td>
<td>Keep records and make use of them</td>
<td>To buy copy books, pen and rule</td>
<td>All this workshop participants</td>
<td>From 28th January, 2003</td>
</tr>
</tbody>
</table>
2.4.7.0 Institutional analysis:
The farmer research group in this village is called **Uhuru** and institutions working/available in the area are as presented below

2.4.7.1 List of stakeholders working in the area

<table>
<thead>
<tr>
<th>Within the village</th>
<th>Found outside the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Primary school Nkokwa</td>
<td>I. Njugilo dispensary</td>
</tr>
<tr>
<td>II. Village government</td>
<td>II. Ward extension worker VEW. (Agriculture and health)</td>
</tr>
<tr>
<td>III. Churches</td>
<td>III. Outside middlemen such as BIOLAND, Mohamed Enterprises Frédé Husein etc.</td>
</tr>
<tr>
<td>IV. Pombe shop Boda</td>
<td>IV. District Council (DALDOs Office)</td>
</tr>
<tr>
<td>V. Open Market Sinyanga</td>
<td>V. Police station Kyela</td>
</tr>
<tr>
<td>VI. Football and netball team</td>
<td>VI. Primary court Busale</td>
</tr>
<tr>
<td>VII. Traditional ngoma (Bulanga)</td>
<td>VII. ARI Ilongo</td>
</tr>
<tr>
<td>VIII. Middlemen</td>
<td>VIII. Kikusya rice seed research</td>
</tr>
<tr>
<td>IX. Itope Sec School</td>
<td>IX. KIODI saving and credit</td>
</tr>
<tr>
<td>X. Saving and credit KIODI; Provide loans to farmers</td>
<td></td>
</tr>
<tr>
<td>XI. KYERUCU District Cooperative union</td>
<td></td>
</tr>
</tbody>
</table>

2.4.7.2 What services these stakeholders provide

I. Primary school Nkokwa: *Provide primary school education to children*

II. Village government: *Rule and governs the village*

III. Churches: *Provide spiritual services*

IV. Pombe shop Boda: *Drinking local brew, selling and buying small commodities*

V. Open Market Sinyanga: *Selling and buying small agricultural inputs and farmer produce as well as household commodities*

VI. Football team: *Recreation and physical exercise for youth*

VII. Traditional ngoma Bulanga: *For recreation and unite farmers from neighbouring villages and neighbouring country Malawi*

VIII. Middlemen: *Buys farmer produce at a very low price*

IX. Dispensary Njugilo: *Provide cure, prevention and education on health services*

X. Primary cooperative society Itpande: *Buys rice and cashew nuts*

XI. Ward extension worker WEW: *Provide agric extension advisory*

XII. External middlemen such as Mohamed Enterprises Frédé Husein etc, they buy farmers produce at a very low price

XIII. District Council (DALDOs Office) offers agricultural advisory services & coordinate all agricultural activities

XIV. Police station Kyela: *Ensures peace by enforcing laws and regulations*

XV. Primary court Busale: *Provides rights to farmers*

XVI. ARI Ilongo: *Facilitate farmer to conduct research on improvement of soil fertility and to eradicate striga*

XVII. Kikusya rice trial site: *Screens and evaluate rice varieties.*

XVIII. Secondary school Itope; provide secondary school education their children.

XIX. Saving and credit KIODI: *Provide loans to farmers*

XX. KYERUCU District; *Cooperative union; Sells agriculture inputs on loan and buys farmer produced crops*
2.4.7.3 The Venn diagram developed by Uhuru farmer researcher group.
2.5 Kiswira Village Matombo - Morogoro rural District.

In this village work on rice/Striga started in 2003. Training was conducted on Striga life cycle and control measures during the two seminar village meeting held in September and November. During that time farmer formed a research group with a number membership of 18 including 6 women.

2.5.1 Historical changes

a). Political;
• Multiparty system, This has improved democracy and freedom of expression by farmers
• Village leadership is strengthened by having sub-village leaders
• The society is not aware of the national policies
• Ruling party and government responsibilities have been separated.
• There is peace and harmony

b). Economic situation
• Rice production has dropped from 10 to 2 bags/acre over the past 20 years
• There has been a decline in fertility in farmer’s fields.
• The population has increased from 350 to 3324 Households
• Free market economy has affected the prices of rice.
• Abolition of boundary barriers trade has enabled middlemen from Kenya to come to our village to purchase fruits
• 85% of the land is owned by a Catholic Mission and, 15% owned by the Government. Farmers know little about the lease but they pay 1000/= to the mission for piece of lands they cultivate per year.
• Goats and pigs are kept

c). Cultural value of rice
• Rice and maize are the special food during festivals, dowry
• The yield drop has forced the society to change theft cases have increased.

d). Social changes
• Cultivation used to be done collectively but this is no longer practised
• Sale of agriculture inputs has been privatised and is being sold at very high price.
• Farmers are not aware of the importance of Extension officers in providing agricultural information and advises of agricultural problems
• There is a high incidence of theft of rice
e). Environmental
- Rains are very unreliable. Farmers think that is due to deforestation.
- Gully formation due to soil erosion.
- There is soil fertility depletion in farmers’ fields hence increase in *Striga* infestation
- Occasionally there are outbreaks of insects and diseases.
- There are very few wild animals with an exception of monkeys, which are increasing.

f). Gender situation

<table>
<thead>
<tr>
<th>No</th>
<th>Activity in rice production</th>
<th>Done by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>1</td>
<td>Land preparation and cultivation</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Planting</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Weeding</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Harvesting</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Who owns the produce</td>
<td>X</td>
</tr>
</tbody>
</table>

2.5.2 Farmer capacity to grow rice

a). Strength
- Muscle strength.
- Own small agricultural equipment e.g. hand hoes.
- Land is hired and limited.
- Seed is collected from previous harvest.
- Rice growing technologies are inherited from fathers.

b). Opportunities that are available.
- Animal manure and farmyard manure is available
- Extension officers are available
- Researchers are available
- Village government and District authorities support rice production
- Rice can be stored and sold later

c). Weaknesses
- No market information
- No records on agricultural activities are kept by farmers
- Poor practice of agriculture technologies
- Farmers don’t look for agriculture information

d). Threats to rice production
- Drought
- Army-worm outbreaks
• The presence of *Striga* in their rice fields

### 2.5.3 Farmers experiences in growing rice

#### a). Success
Rice ensures ca 50% of household food security and good relationship with neighbours.

#### b). Problems and how they have been solving them
- There are outbreaks of birds; diseases and insect pests, farmer’s complaint on them affecting yield of rice and have no solutions.
- Prices of crops are not attractive to farmers and nothing is being done to curb the situation
- The number of fields infested with *Striga* are increasing- *Striga* research has started
- There is poor or no record keeping and no measures taken
- Poor soil fertility – sometimes there is crop rotation of the following crops sesame or cassava. Maize is severely attacked by *Striga*.
- They lack agricultural information- no measure taken.

### 2.5.4 Researchers’ experiences:
Training on Striga biology and control options has been conducted in the village. However it was noted that:
- Farmers are not creative to look for solutions to their agricultural problems.
- Farmers seem to have despaired as they are satisfied with yield obtained
- Farmers wanted to be given solution of their problems
- The research was not well understood in the first place, there is hope for improvement after this workshop.
- *Striga* knowledge is already with farmers from November 2002 seminars.
- They have to create a behaviour of teaching other farmers

### Key issues
From the workshop analysis of the situation above, findings were analysed and summarised into the following key issues;

1. Farmers did not know the real situation of their village that affected the rice production.
2. Farmers’ knew that maize/upland rice production has been reduced by *Striga* infestations from 20 to 5 bags of maize and 10 to 2 bags of rice per acre but did not visualise its impact. It was seen as a normal situation.
3. Farmers were not keen to keep records and participate in research on rice and use research findings
4. Farmers of Kiswira village have been depending on resources and knowledge from outside their village, which they cannot afford.

From the analysis all farmers agreed to start awakening and they developed the following challenge:
Farmers of Kiswira village wants to improve production from 2 to 10 bags for rice and 2 to 20 bags for maize per acre while improving soil fertility by complete eradication of Striga and improving soil fertility through research.

**2.5.5 Strategies**

<table>
<thead>
<tr>
<th>Key issue no.</th>
<th>What to be done</th>
<th>How to be done</th>
<th>By whom</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>Train all other farmers</td>
<td>Making use of formal and informal gathering</td>
<td>All this workshop participants</td>
<td>From 30th January 2003</td>
</tr>
<tr>
<td>2.</td>
<td>Know the standard yield of various crops.</td>
<td>Telling your fellow farmers your yield and compare with the targeted yield to note the gap</td>
<td>All this workshop participants</td>
<td>From 30th January 2003</td>
</tr>
<tr>
<td>3</td>
<td>Farmers must have a goal, keep records and make use of them</td>
<td>To buy copy books, pen and rule</td>
<td>All this workshop participants</td>
<td>From 30th January, 2003</td>
</tr>
<tr>
<td>4</td>
<td>Farmers must be creative</td>
<td>Depend and make use of the available resources</td>
<td>All workshop participants</td>
<td>From 30th January, 2003</td>
</tr>
</tbody>
</table>
2.5.6. Institutional analysis
This is a group of researcher farmers called Uhuru Institutions working/available in the area includes

2.5.6.1 List of stakeholders working in the area

<table>
<thead>
<tr>
<th>Within the village</th>
<th>Found outside the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Primary school Matombo</td>
<td>I. ARI Ilonga</td>
</tr>
<tr>
<td>II. Village government</td>
<td>II. Mtamba primary school</td>
</tr>
<tr>
<td>III. Matombo Parish</td>
<td>III. VTTP</td>
</tr>
<tr>
<td>IV. Mission Dispensary</td>
<td>IV. District Council (Agriculture Health and Education)</td>
</tr>
<tr>
<td>V. Primary cooperative</td>
<td>V. Ward extension worker VEW. (Agriculture and health)</td>
</tr>
<tr>
<td>society</td>
<td>VI. Primary cooperative society</td>
</tr>
<tr>
<td>VI. TAG church</td>
<td>VII. Mtamba Mosque</td>
</tr>
<tr>
<td>VII. SACCOS</td>
<td>VIII. Outside middlemen such as, Mohamed Enterprises buyers from</td>
</tr>
<tr>
<td>VIII. Internal middlemen</td>
<td>Kenya etc.</td>
</tr>
<tr>
<td></td>
<td>IX. Police Station Mtamba</td>
</tr>
<tr>
<td></td>
<td>X. FINCA</td>
</tr>
<tr>
<td></td>
<td>XI. UMADEP</td>
</tr>
<tr>
<td></td>
<td>XII. JICA</td>
</tr>
</tbody>
</table>

2.5.6.2 What services these stakeholders provide

I. Primary school Matombo; Provide primary school education to children
II. Primary school Mtamba; Provide primary school education to children
III. Village government; Rule and governs the village
IV. Matombo Parish; Provide spiritual services
V. Primary Cooperative society; selling and buying small Agric inputs and farmer produce as well as household commodities
VI. Internal middlemen; Buy farmers produce at a very low price
VII. Mission Dispensary; Provide cure, prevention and education on health services
VIII. TAG Church Provide spiritual services. There are few served members
IX. SACCOS Provide credit and loans to farmers
X. Cooperative society; Farmer sells their crops but the price is low
XI. Ward agricultural extension officer WAEQ; Provide agric extension advisory;
XII. External middlemen such as Mohamed Enterprises Buyers from Kenya etc. Buys farmer produce at a very low price
XIII. District Council (Agriculture Health and Education) Offers advisory services & coordinate all agriculture health and education activities
XIV. Police station Mtamba; Ensure peace by enforcing laws and regulations
XV. FINCA; Provides loans to women in the village. Only one member had accessed to the loan and is not known to many of the villagers
XVI. UMADEP; NGO offering capacity building services on agro-forestry and other development activities
XVII. JICA; Offer extension services.
XVIII. VTTP; Deals with road construction.
2.5.6.3 The Venn diagram developed by Kiswira farmer research group.
2.6.0. Kibangile Village Matombo Division Morogoro Rural District
The Striga research started September 2002 with introduction of the research work and established a farmer research group. They received Marejea and pigeon pea for establishment of demonstration plots.

2.6.1 Historical changes

a). Political
- Multiparty system, This has improved democracy and freedom of expression among farmers.
- Village leadership is strengthened by having sub-village leaders
- The society is not aware of the national policies
- The party and government responsibilities has been separated
- There is peace and harmony
- The village encourage rice and maize production
- Women are not participating in leadership

b). Economic Situation
It was realized that rice and maize are the major crops
- Rice and maize production has dropped down; rice from 10 –2 bags/acre while maize from 20-2 bags /acre over 20 years.
- Farmers keep chicken (5-20 heads per household), ducks (5-20 per household) and goats (10 per household).
- Free market economy has reduced crop prices.
- Prices of agricultural inputs has gone up
- Farmers are allowed to carry cross border trade, there are many middlemen from Kenya in the village who buy fruits.
- Seed is recycled from year to year.
- A large portion of the land is under National reserve and part is rocks. The average area per household is 2 acres. Farmers practice mixed cropping.

c). Cultural value of rice
- Rice and maize are the special food during festivals and dowry, however this is changing slowly as cash is more usual.
- The yield drop has forced the society to change, hence theft cases are increasing.

d). Social changes
- Cultivation used to be done collectively. This is no longer the practice, delaying some field operations. Low productivity has led this tradition to stop.
- There is a lot of theft of crops
• The business of agriculture inputs has been privatized and now sometimes-fake products are being sold to farmers.
• About 15% of farmers have rice fields outside the village this has been facilitated by the District government. They’re about 350 households in the village and the population is increasing.

e). Environmental
• Rainfall seasons have changed and are unreliable.
• Drought
• There is fertility depletion in farmers’ fields hence increase in Striga
• Bush clearing for farms
• The wild animals and birds attacking their fields have increased due to nearby National Forest Reserve.
• Occasionally there are outbreaks of insects and diseases
• There is soil erosion
• The depth of water in rivers is decreasing by siltation
• There is a village environmental committee which is looking after the forest reserve

f). Cultural value of rice
Rice is a special food for adulthood initiation ceremony. During traditional rituals millet is used
• **Napier grass is planted at four corner of the field and at the centre to prevent Striga. It was believed to work however this has never been investigated.

g). Gender responsibility
There is a division of labour for crop production. Women undertake all rice production activities. Men and women jointly harvest both crops rice and maize, but at the end men control the produce and income.

2.6.2 Farmer Capacity to grow rice and Maize

a). Strength
• Muscular power.
• Hand hoes.
• Land.
• Health.
• Rice growing technologies are inherited from their fore fathers.

b). Opportunities
• Limited animal manures (most from chicken).
• Extension officers are available although not staying in the village
• Researchers are available
ARI Ilonga

- Village government and District authorities support rice production
- Rice can be stored and sold later
- There is now a farmer research group
- *Crotalaria* is also available recently supplied by the project.

c). Weaknesses
- No market information
- No records are kept
- They don’t look for agriculture information
- Targeted market is Morogoro
- Good agronomic practices are not put into practice

d). Threats to rice production
- Dry spell within the rain season especially after the short rains in January/February, rice is at vegetative stage.
- The presence of *Striga* in their rice fields, its ability to produce a lot of seed with long viability in the soil (15 to 20 years)
- Extension officers are not utilized by farmers

2.6.3 Farmers experiences

a). Achievements
Among other food crops, rice also contributes to ensure household food security and good relationship with neighbours.

b). Problems and solutions
- Outbreaks of insect pests and stalk borers. Spraying is done by extension officer
- Prices of crops are not attractive to farmers and nothing is being done to cub the situation
- The fields infested with *Striga* are increasing- Crop rotation with cassava or sesame.
- Dry spell- nothing is done there are no contour bands and rainwater harvesting measures. Irrigation is not practiced. Only deep tillage is done during cultivation.
- There is poor or no record keeping- no measure are being undertaken.
- Poor soil fertility – weeds are ploughed under
- They lack agricultural information- no measure
- Theft- individual farmers have to be vigilant.

2.6.4 Researchers’ experiences
Training on Striga has been conducted in the village and control measures described. However it was noted that:
- Farmers do not keep records
• They don’t look for agricultural information
• They seem to despair
• They must be proud at least of what they are achieving

2.6.5 Key issues.
From the workshop analysis of the situation above, findings were analysed and summarised into the following key issues;
1. Production of maize and rice has dropped, rice 10-2 bags /acre, while maize 20-2 bags/acre because of poor agronomic practices and Striga infestation
2. Farmers of Kibangile were not aware of the context of their village
3. Farmers do not keep records nor do they make use of them

From the key issues farmers agreed and developed the following challenge.

Farmers of Kibangile want to improve production of rice from 2 to 10 bags per acre and maize from 2 to 20 bags while improving soil fertility by eradication of Striga through research.

2.6.6: STRATEGIES

<table>
<thead>
<tr>
<th>What to be done</th>
<th>How to be done</th>
<th>By whom</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Apply good agronomic practices</td>
<td>Workshop participants must do it practically</td>
<td>All workshop participants</td>
</tr>
<tr>
<td>2</td>
<td>Education to all farmers in the village</td>
<td>By telling your fellow your yield and compare with the targeted yield</td>
<td>All workshop participants</td>
</tr>
<tr>
<td>3</td>
<td>Farmers must a collect and keep records and make use of them</td>
<td>To buy copy books, pen and rule</td>
<td>All workshop participants</td>
</tr>
</tbody>
</table>
3.0 List of Farmer Participants for Each Village.

I. Kilasilo village-Kyela
1. Aggrey Aliko
2. Sankey Kandonga
3. Air Kyoma F
4. Tusajigwe Isumo F
5. Ester Kubali F
6. Sinyagile Nambisa F
7. Z Nakajange F
8. S. Naswila F
9. Saidia Mwakafyuju
10. L Mwakapona
11. J. Mwakatage
12. A Mwakanyasi
13. K Mwasawmene
14. Kibatika
15. Alfred
16. E.R Mwaipopo
17. Oscar Mbonge
18. Asegelisy Mwaseba
19. Bernad Mwakalinga
20. Ruth Kaluma F
21. Rhighton Msenyenye
22. Modem Kyamba

II. Itope Village-Kyela
1. Abdallah Mbalangwe
2. Mwema Hamisi –chairman
3. Asajenie Mwakitubwa
4. Samson Mwakanyamale
5. Yusuf Kayui
6. Edward Mwang’onda -Secretary
7. Fatuma Mwakanyamale-F
8. Rehema Mwalaba-F
9. Hamisi Mwema
10. Christopher Mwaisabila
11. Tereza Mwisabila-F

III. Njugilo Village-Kyela
1. Robert Mwailubi-Secretary
2. Andwele Mwakasege
3. Jackson Salim- Chairman
4. Philimom Mwakasege
5. Fransis Mwaisumbo

6. Steven Mwangalaba
7. Jason Mwasege

IV. Sinyanga Village - Kyela
1. Lusekelo Kawilo- chairman
2. Frank Panja
3. Bosco Njetile
4. White Mwansasu
5. Rabson Kaposolo
6. Neema Bukuku
7. Mbutolwe Panja- Secretary (left for teachers college training)
8. Henry Simfukwe
9. Israel Mwaijande

V. Kiswira Village-Matombo
1. Adolf Mawango-secretary
2. George Mkami-chairman
3. John Msimbe
4. Aloys Dominic
5. Vicent Alban
6. Wilvina Damas
7. Michael Roman
8. Otto Mzeru

VI. Kibangile Village-Matombo
1. Pili Mohamed
2. G. Joseph Mkoba
3. Abdul Rajabu
4. Jumanne Rashid Mpeka
5. Filbert Roman
6. Beatus E Kunambi
7. Angela Aloys
8. Josephine Amos- secretary
9. Mzeru H Mbaruku
10. Salehe Ahmad-Chairman