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Assessment of Science and Technology in Agriculture by Hai District Farmers, Kilimanjaro Region, Northern Tanzania

By

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Farmer group activity reports for the DFID Crop Protection Programme (CPP) Bean IPM Promotion Project in eastern and southern Africa

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For distribution to Village Information Centres (VICs) in bean growing areas in eastern, central and southern Africa.

Abstract

Thirty nine farmers including 20 men and 19 women from 17 - IPM learning groups on the south western slopes of Mount Kilimanjaro, northern Tanzania were facilitated to convene a meeting to discuss and assess information on science and technology in agriculture in their district. These farmers pointed out that, government institutions provide information on such fields as animal and human diseases control, breeding and housing for livestock, fertilizer use, plant pests and diseases control, crop storage and seed production. When the information is received, it is mostly not understood well by individual farmers unless it is demonstrated and discussed in farmer or other community groups. The farmers also stated that satisfactory information has not been provided for quality seed production, weather forecast, marketing, crop processing and soil fertility assessment. Non-governmental and community based organizations have assisted in providing credit and some information on markets, husbandry, agribusiness and environment conservation.

The main media through which farmers have been receiving science and technology information are learning and demonstration plots, field days, study tours and extension agent visits. Women farmers prefer learning groups, study tours, demonstrations and field days to be used mainly for

disseminating information while men farmers prefer mostly extension agents, learning groups and study tours. More collaboration among the stakeholders is recommended as a strategy to acquire science and technology for agriculture in future.

The farmers posed HIV/AIDS as a big threat to science and technology in agriculture in that it reduces labour and forces them to divert their resources away from agriculture. Community education came up as a major strategy to address the situation.

1. Background

The information presented in this short report was generated by integrated pest management (IPM) farmer group representatives from Hai district during a one-day meeting that was organised by the district agriculture and livestock development officer (DALDO). The meeting was attended by 39 farmers (20 men and 19 women) and 7 extension officers (5 from some of the villages and 2 from the district office). These farmers represented a total number of 40,000 smallholder households that grow common beans for food and cash in Hai district. At the

end of the meeting, four farmers were nominated to compile the report.

Hai is one of the 5 districts in Kilimanjaro region, northern Tanzania. The district is situated on the south-western slope of Mount Kilimanjaro - "The roof of Africa". Hai covers an area of 2,168.7 square kilometres with a total population of 260,000 (National Census 2000). The district is categorised into two main agricultural zones:

i. Highland: This zone is characterised by high population density and small land holdings. Farmers grow coffee, bananas, Irish potatoes, wheat, beans, maize, different vegetables and fruits. They also keep livestock such as cattle, goats, sheep, poultry and pigs, all at zero grazing. The soils in this zone are fertile volcanic loams.

ii. Lowland: This zone is sparsely populated and farmers grow maize, beans, various vegetables, rice, fruits, sunflower and pigeonpea. Farmers also keep cattle, sheep, goats and poultry on free-range system. The soils are mostly sandy with relatively low fertility compared to the highland zone.

2. Criteria used to select farmers for the meeting

All farmers come from smallholder production systems involving crop cultivation and livestock keeping. The meeting was conducted with farmers nominated by the 17 IPM farmer group members in Hai district (Table 1). Most of these groups were formed under different pest problem needs from 1996 to 2001 and they are substantially dynamic and diverse in their activities. The main characteristics of the groups include:

- All members are small-scale farmers
- All farmer groups establish IPM learning plots and or improved crop variety demonstration plots in collaboration with extension and research institutions
- Some of the farmers are experimenting with improved livestock breeds, forages and traditional livestock medicine
- Some farmers are also experimenting with various soil nutrient management technologies
- Few farmer groups especially those managed by women, operate small-scale agro-enterprises including sunflower oil pressing mill and milk processors.

Table 1: Farmer group names and village locations in Hai district, Kilimanjaro region

No.	Name of farmer group	Village
1	Kahawa 'R'	Roo
2	Upendo 'B'	Sanya Juu
3	Mshikamano	Sanya Juu
4	Mwamko	Sanya Juu
5	Mwamko	Kwasadala
6	Twajaribu	Kwasadala
7	Kwavegro	Kware
8	Upendo	Magadini
9	Tumaini	Magadini
10	Jikomboe	Mungushi
11	Kwa Nkya	Mungushi
12	Mwangaza	Donyo
13	Kazi ni utu	Makiwavu
14	Mkombozi	Mungushi
15	Weru Weru Juu	Kimashuku
16	Jikomboe/Kianga	Kimashuku
17	Igule	Kimashuku

3. Farmers' main activities

- Farmers grow different crops such as maize, coffee, beans, banana, vegetables, fruits, pigeon pea, sunflower, paddy rice, wheat, cassava, sweet and Irish potatoes
- Livestock keeping such as cattle, goats, pigs, poultry, rabbits, donkeys and sheep
- Some farmers also keep bees and others own fish ponds.

4. Institutions that provide services and information to farmers

Table 2: Types of Institutions that provide agriculture information and input services

Institution	Score (out of 10)
Government institutions	5
Non Government institutions	5
Community based institutions	3

5. Non-governmental and community based organisations providing information on agriculture

- World Vision International, Tanzania (WV Tz)
- German Technical Aid (GTZ) Integrated Pest Management Project (IPM)
- Mwalimu Nyerere Foundation
- Evangelical Lutheran Church of Tanzania (ELCT)
- Roman Catholic Church
- Financial Advice in Development Assistance (FAIDA)
- TechnoServe
- Muungano wa Vikundi vya Maendeleo Hai (MUVIMAHA) – Association of Hai Farmer Groups)
- Heifer Project International (HPI)
- EnvironCare
- Various seed companies
- Tanganyika Farmers' Association (TFA)
- Kilimanjaro Native Cooperative Union (KNCU)

6. Types of services provided by NGOs & CBOs:

- Market information
- Information on crops and livestock production
- Information on agribusiness practice
- Guidelines on environmental conservation
- Provision of credit for inputs such as seed, fertiliser, pesticides and improved livestock breeds.

7. The form that farmers receive new technology and apply it in their field

- Mostly when technology is received from research and extension, it is not in the form that farmers can understand and follow. They can only adopt when it is received in a learning group where through discussion (exchanging ideas and sharing experiences) and practising (learning by doing) the objective is realised
- Most farmers make changes to the information before applying it in their field according to their areas. Such changes are made to suit their own production systems

- Some farmers are testing the technologies in small plots prior to adopting them in their farms
- Other farmers wait until their colleagues generate results and if convinced they too join in the experimentation process or adopt them directly on their farms
- Other farmers only experiment with their groups and do not adopt the technologies.

Hai farmers prioritising the different media through which they have been accessing information on S and T in agriculture

Table 3: Different channels/media used by farmers to access information on Science and Technology

No.	Media	Score (out of 10)
1.	Learning/demonstration plots	5
2.	Farmer field days	5
3.	Extension workers	4
4.	Seminars and meetings	3
5.	School and colleges	2
6.	Researchers	2
7.	Study tours	2
8.	Family members	1
9.	Magazine/newsletters/papers	1
10.	Leaflets and posters	1
11.	Radio &TV	1
12.	Neighbours	1
13.	Poems	1
14.	Traditional dances	1
15.	Drama	1
16.	Preaching in mosques & churches	1
17.	Labels on packages	1
18.	Stockists	1
19.	Announcements	1
20.	Markets/traders	1
21.	Telecommunication	1

Table 4: Types of technology provided for crop production:

No.	Technology	Score (out of 10)
1.	Proper application and appropriate fertilizer rates (both organic and inorganic fertilisers)	6
2.	Management of insect pests and diseases	5
3.	Appropriate crop storage	5
4.	Soil fertility testing/assessment and management	5
5.	How to produce quality seeds	5
6.	Land preparation	3
7.	Improved agronomic practices (spacing, weeding, harvesting, etc.)	1

Table 5: Crops that farmers do not get enough science and technology information

No.	Crop	Score (out of 10)
1.	Soybeans	4
2.	Fruits	4
3.	Beans	3
4.	Vegetables	3
5.	Pigeonpea	3
6.	Sunflower	3
7.	Cassava	3
8.	Maize	2
9.	Coffee	2
10.	Banana	2
11.	Potatoes	2
12.	Paddy	2
13.	Groundnut	1
14.	Sugarcane	1
15.	Wheat	1

8. Types of technologies provided to farmers for dairy cattle, poultry, pigs, goat and sheep are:

- Diseases control
- Breeding
- Housing

Table 6: Types of livestock on which farmers do not get enough science and technology information

No.	Livestock type	Score (out of 10)
1.	Dairy cattle	5
2.	Poultry	5
3.	Goats	3
4.	Sheep	1
5.	Pigs	1
6.	Rabbits	1

9. Specific technologies that farmers need, but have not efficiently been provided by the current research and extension institutions

- How to produce farmers' own seed of improved crop varieties
- Reliable meteorology information/weather forecasting
- How to secure markets for agriculture products
- Technologies for efficient livestock and crop products storage.

- Fruit and animal production technologies (e.g. Papaw and poultry sexing, knowledge on artificial insemination, etc.)
- Soil fertility assessment.

10. Strategies proposed by farmers on how to acquire information on the technologies that are not provided

- More collaboration between farmers, extension agents and researchers
- Farmers to be more creative and innovative
- More training to farmers, extension and researchers
- Farmers to contribute to research activities
- To strengthen farmer groups
- Farmer groups to form farmer associations (SACCOS).

11. The media through which farmers would like to receive new information on Science and Technology differs with gender (Tables 7 and 8)

Women farmers discuss the preferred media for disseminating new information on S and T in agriculture

Men farmers discuss the preferred media for disseminating new information on S and T in agriculture

Table 7: Media proposed to be used to disseminate information to the farmers according to men farmers

Media	Score (out of 10)
Extension	6
Farmers groups	5
Study tours	5
Learning/demonstration plots	4
Booklets, posters, leaflets, magazines, flyers	4
Farmer conferences/meetings	3
Village information centres (library) - (VIC)	3
News media	2
Announcement	1
Traditional dances, drama	1
Poetry	1

Table 8: Media proposed to be used to disseminate information to the farmers according to women farmers

Media	Score (out of 10)
Farmer groups	5
Study tours	5
Learning/demonstration plots	5
Farmer field days	5
Extension workers	4
Farmers library	4
Researchers	4
Seminars	3
Farmer conferences and meetings	3
Radio, posters, leaflets	2

12. The effects of HIV/AIDS to the farming community

- Labour reduction
- Increase in poverty levels due to time and resources devoted to nursing patients and funeral/burial expenses
- Guardians use more time to care orphans
- Aids victims are not employed for casual work
- Loss of trained manpower - a large number of extension workers, researchers and teachers is affected
- Cases of theft is on the increase due to unsupported orphans
- National Government budget is direct to HIV/AIDS issues instead of agricultural and educational services.

13. Strategies of HIV/AIDS control

- Provide education on HIV/AIDS to the public
- Testing for HIV/AIDS to know the health status of the farming community
- Devote to hard work in the field as idling is a predisposing factor to activities that may lead misbehaviour
- To prohibit predisposing factors including pornographic cinema and excessive alcohol consumption.

14. How the above strategies can be implemented

- Through farmer groups
- Through seminars
- Through news media (radio, TV, newspapers, etc.)
- Through leaflets, posters, fliers
- Through village information centres (library), mosques, churches and market places
- Through warnings on input label/stickers
- Through health service and education providers.

15. Benefits of the meeting to participating farmers and their groups

- Avenue for farmers to exchange knowledge and share experiences
- Forum to know each other and their activities
- An opportunity to know different research activities conducted by the various farmer groups in Hai district
- An opportunity to gain new knowledge on botanicals which can control livestock diseases.

A farmer in the meeting explains the use of locally available plants for livestock disease management

16. How farmers are going to use the information gained from the meeting

- To educate other farmers in their groups
- To improve agricultural activities in their individual and group farm fields
- To promote net working
- To encourage other farmers to form farmer research and learning groups to be able to access knowledge and information
- To put into practice the output of the meeting after being presented and discussed in the international meeting at Addis Ababa next month.

17. Farmers' expectations

- To acquire more knowledge on crop and livestock production
- To know what is going on with other farmer groups, researchers and extension agents
- To learn more about botanical pesticides and green manures
- To exchange ideas and to gain new knowledge about agricultural pesticides (both traditional and commercial products)

- To gain knowledge on improved agricultural practices
- To gain knowledge on the agronomy of different crops
- To learn how to grow to produce crops and livestock products for the market and acquire market information to be able to organise viable agribusinesses
- To learn how to collaborate with extension agents and research institutions.

Acknowledgements

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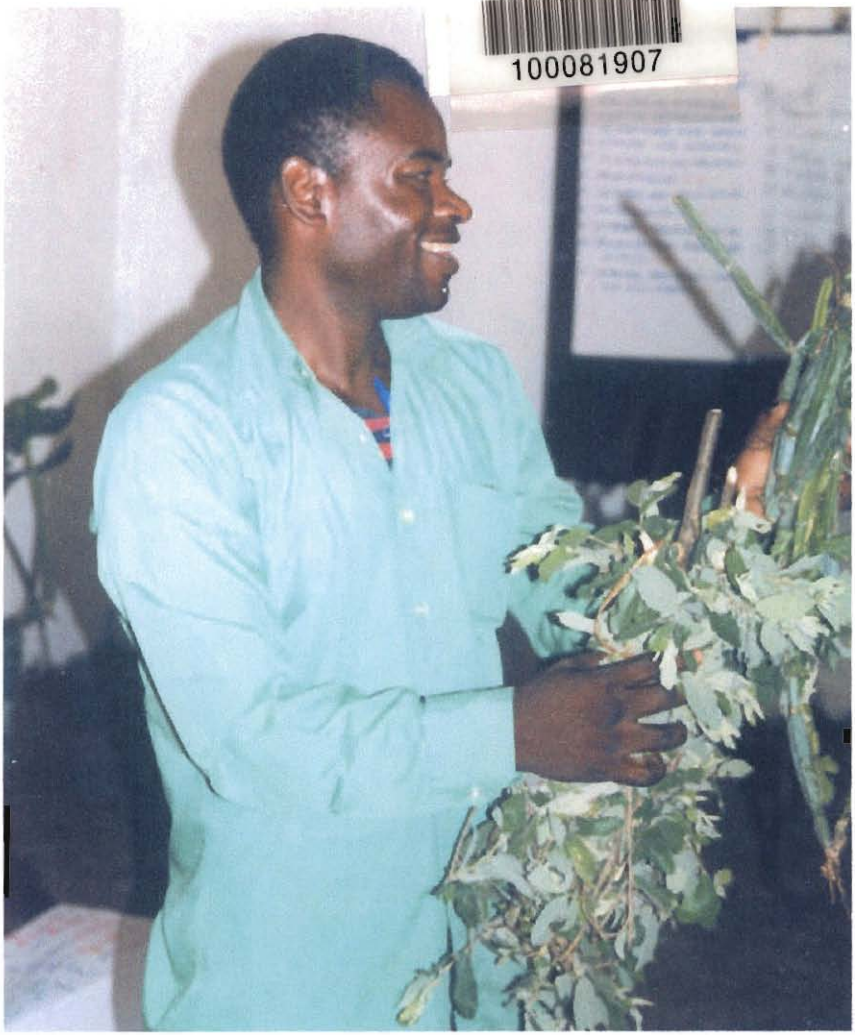
List of participants: Assessment of Science and Technology in Agriculture Hai District 09/05/2003

No.	Name	Sex	Group	Village	Destination
1.	Robinson Mwanga	M	Karoo	Karoo	Farmer
2.	Victoria Malisa	F	Upendo/"B"/S/Juu	S/Juu	V. Ext. Officer
3.	Edita Mushi	F	Mwamko	S/Juu	Farmer
4.	Emieline Masawe	F	Kujikomboa	Kimashhuki	Farmer
5.	Janeth A. Munisi	F	Ingole	Kimashuki	Farmer
6.	Christina Wilson	F	Mshikamano	S/Juu	Farmer
7.	Pudediana Massawe	F	Mwamko	S/Juu	Farmer
8.	Frumen Mshanga	M	Mshikamano	S/Juu	Farmer
9.	Issa Sadick	M	Mwamko	Kwasadala	Farmer
10.	Joseph Aloyce	M	Weruweru	Kimashuki	Farmer
11.	Festo N. Lema	M	Weruweru	Kimashuki	Farmer
12.	Neemes Maleo	M	Kazi Ni Utu	Makiwaru	Farmer
13.	Bashiri Tarimo	M	Jikomboe	Muagushi	Farmer
14.	Cosmas Massawe	M	Bw/Shamba	Mungushi	V. Ext. Officer
15.	Amiriam Mtui	M	Kazi Ni Utu	Makiwaru	Farmer
16.	Robertl Kawiche	M	Upendo	Magadini	Farmer
17.	Akanashe Nkambi	F	Tumaini	Magadini	Farmer
18.	Ngundeny Kombe	F	Tumaini	Magadini	Farmer
19.	Emeline E. Swai	F	Kahawa Roo	Roo	Farmer
20	Hasani K. Swai	M	Kahawa Roo	Roo	Farmer

21.	Aimana M. Lema	F	Kwankya	Mungushi	Farmer
22.	Evaline Salekwa	F	Upendo'B'	Sanya Juu	Farmer
23.	Mary Tengio	M	Upendo 'B'	Sanya Juu	Farmer
24.	Leonce Bura	M	Mshikamano	Sanya Juu	Farmer
25.	Reminiscar Moshi	F	Mshikamano	Sanya Juu	Farmer
26.	Jumanne Maya	M	Mshikamano	Sanya Juu	Farmer
27.	Felix Mosha	M	Mwamko	Sanya Juu	Farmer
28.	Benjamini Mwanga	M	Twataribu	Kwasadala	Farmer
29.	Jerad D. Ulomi	M	Kwawecro	Kware	Farmer
30.	Firidiana Kyaku	F	Kwavegro	Kware	Farmer
31.	Rundyael Joseph	F	Kwavelibo	Kware	Farmer
32.	Ngenesaeli L.	F	Mshikamano	Sanya Juu	Farmer
33.	Albelrt A. Mmassy	F	Mwangaza Bondeni	Donyomuraki	Farmer
34.	Joycel Kessy	F	Tumaini	Magadini	Farmer
35.	Pailo Ndossy	M	Upendo	Magadini	Farmer
36.	Naiman O. Kimaro	M	Tumaini	Magadini	Farmer
37.	Elisamia Sawe	M	Mkombozi	Mungushi	Farmer
38.	Magdalena Massawe	F	Tumaini	Magadini	Farmer
39.	Amanda Koola	F	Veo S/Juu	Sanya Juu	V. Ext. Officer
40.	Luice Minja	F	Veo S/Juu	Sanya Juu	V. Ext. Officer
41.	Rabson C. Ndosa	M	Mkombozi	Mungushi	Farmer
42.	Judith M. Kombe	F	Upendo	Magadini	Farmer
43.	Nikombolwe E.	M	Vaeo	Donyomuraki	V. Ext. Officer
44.	Edward Ulicky	M	Kilimo (W)	Hai	DALDO
45.	M.A. Mfoi	F	Kilimo (W)	Hai	Subj Matter Specialist



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