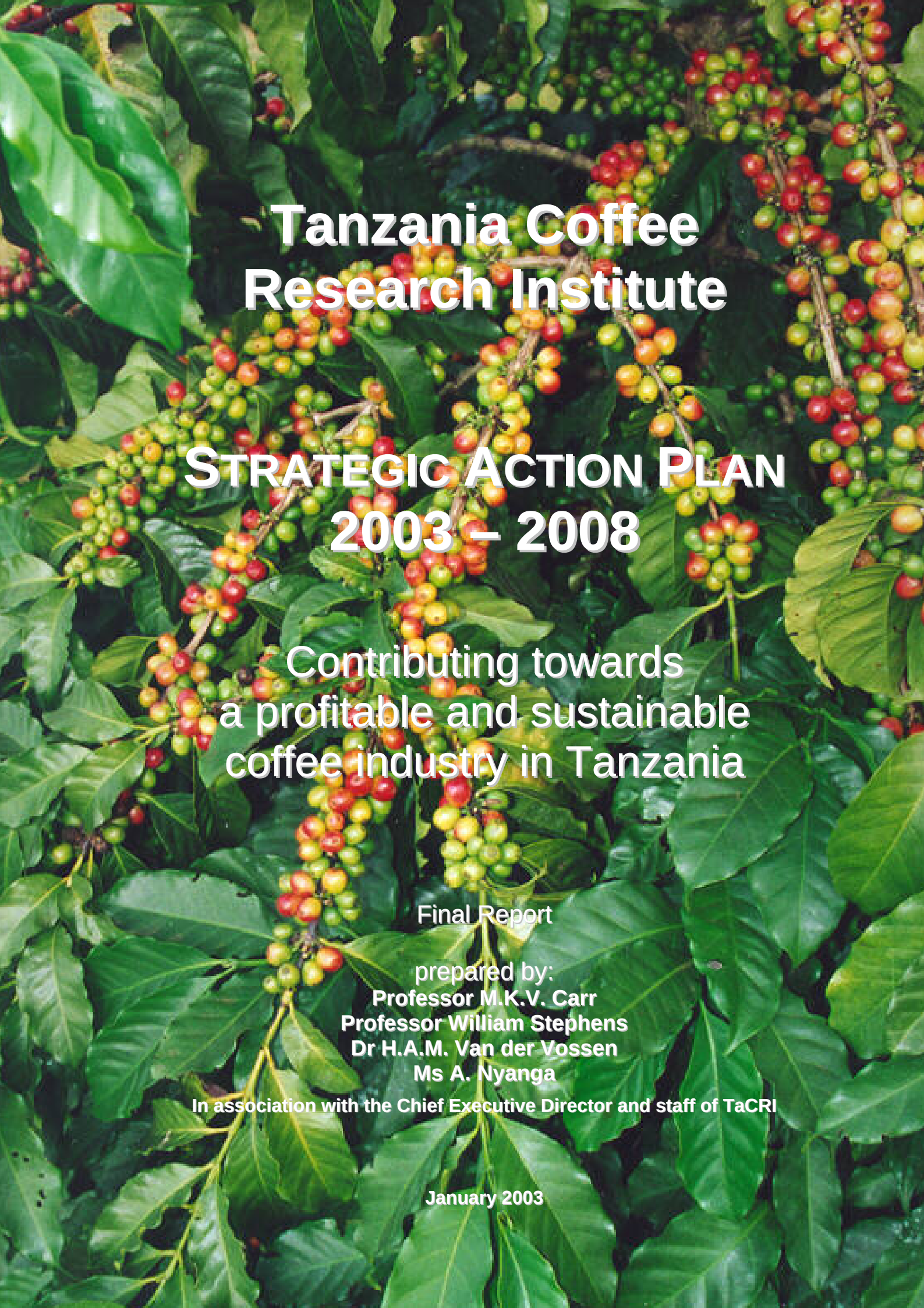

Tanzania Coffee Research Institute

STRATEGIC ACTION PLAN 2003 – 2008

Contributing towards a profitable and sustainable coffee industry in Tanzania

Final Report

prepared by:
Professor M.K.V. Carr
Professor William Stephens
Dr H.A.M. Van der Vossen
Ms A. Nyanga
In association with the Chief Executive Director and staff of TaCRI

January 2003

TaCRI ♣

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Professor N. Hatibu facilitated the Stakeholder Workshop
Report prepared in association with the
Chief Executive Director and staff of TaCRI

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January 2003

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[1] Frontispiece and Plates 2, 6, 8, 13 and 14 © William Stephens; all other plates © MKV Carr.

ACKNOWLEDGEMENTS

The authors of this report wish to express their gratitude to all those people who willingly gave time to share their views on the problems facing the coffee industry in Tanzania, and their expectations of TaCRI. The consultancy was funded by the European Union.

This report is dedicated to those farmers struggling to make a living from coffee at this difficult time. Let us all look forward with optimism.

Ahsanteni!

M.K.V. Carr
William Stephens
H.A.M. Van der Vossen
A. Nyanga, and
N. Hatibu who facilitated the workshop
In association with the Chief Executive Director and staff of TaCRI

January 2003

Plate 1. Lyamungu Coffee Research Centre: September 2002

EXECUTIVE SUMMARY

BACKGROUND

1. TaCRI was incorporated as a company limited by guarantee in 2000 under the Companies Ordinance. With a Head Office at Lyamungu, Moshi, TaCRI became legally constituted and operational in September 2001.The objective of this consultancy was 'to assist TaCRI in the formulation of a medium term (three to five years) research and development strategy (*known as the Strategic Action Plan*) in order to rejuvenate the Tanzania coffee industry through appropriate participatory technology development and dissemination'.
2. The Strategic Action Plan was developed in three phases during July, and August/September 2002, and January 2003. The first part, known as the orientation phase, involved three principal activities: a synthesis of previous reports on coffee research in Tanzania; a country-wide stakeholder analysis, and preparations for a stakeholder workshop held in Moshi at the start of the second, or implementation, phase. From this workshop, the priority activities to be undertaken by TaCRI, as identified by diverse stakeholders, were confirmed.
3. During the implementation phase, previous and on-going research was also reviewed and an organisational structure for TaCRI developed. This was based on the priority activities already identified, together with the expected availability of financial, staff and physical resources at Lyamungu and elsewhere. The need for capacity building (e.g. infrastructure development, including information technology and management information systems, and staff training, including new appointments) to support the successful implementation of these activities was also assessed. The benefits to the industry of TaCRI seeking to work in partnership with other national, regional and international organisations were also considered.
4. A comprehensive logical framework for TaCRI, with outputs and activities for each department was developed, together with an action plan for plant breeding and variety release. Based on the detailed recommendations and expected income from cess, STABEX funds and sundry income, annual budgets for the next five years were prepared. The draft report was submitted to the Board of Directors and the European Union for comment in September 2002. Following feedback, revisions were incorporated in January 2003, and action plans prepared for each of the remaining technical departments. The consultants presented the final report to a meeting of the Board on 20 January 2003. The executive summary, together with the action plans, the logical framework and summary budgets, make up the Strategic Action Plan summary.
5. The Memorandum of Association establishing TaCRI as a legal entity states that 'membership of the Institute (with voting rights at the Annual General Meetings) is open to representatives of the Ministry of Agriculture and Food Security, farmer groups and cooperatives, individual coffee growers, coffee traders and processors'. Procedures were specified by which prospective members (except for the Ministry of Agriculture and Food Security) apply formally to the Board for membership of the Institute through its secretary. It was not clear how this process, and the associated voting rights of the stakeholders, would be

implemented in practice. It would be expected that all cess payers would be members by right. As this issue is fundamental to the legality of TaCRI, the Memarts need to be revised as soon as possible, and in advance of the first AGM.

6. There was concern that nowhere in the Coffee Act (2001) is mention made of TaCRI, including any guarantee of its funding arrangements through the levy, raised by the Tanzania Coffee Board. This puts the funding of TaCRI at risk. In addition, although the TCB is represented on the TaCRI Board of Directors, there is no reciprocal arrangement, which would be desirable. The Coffee Act needs to be amended to reflect these recommendations.
7. In the TCB coffee sector review (2001-2006), TaCRI is associated directly or indirectly with many of the (often worthy) activities identified, but without consideration of the availability of resources, or prioritisation, which is unrealistic.

CONSTRAINTS and PRIORITY ACTIVITIES

8. Following the stakeholder analysis, the principal constraints to the coffee industry, and the priority activities to be undertaken by TaCRI, were identified under the following headings: policy environment; marketing; processing; production and inputs.
9. *Policy environment*: applied research can only be effective if the policy environment allows an industry to prosper. Stakeholders were concerned that currently this is not the case. It is therefore recommended that an independent, effective and representative stakeholder forum based on the Annual Coffee Conference should immediately be constituted. This forum (hereafter called the Coffee Forum) should work with Government to conduct an urgent review of existing policies and regulations relating to coffee, including the role and structure of the TCB, in order to identify the actions that need to be taken to resolve outstanding issues.
10. Since TaCRI, as constituted, represents all stakeholders, it is recommended that TaCRI's Board of Directors takes the initiative by offering, and being supported, to provide the Secretariat for the Coffee Forum. In the longer term TaCRI, as it develops its credibility with the industry through effective research and technology transfer, can provide advice on policy issues to Government through the Forum.
11. *Marketing*: Tanzania must develop/enhance its reputation for producing quality coffee consistently in large enough quantities to attract buyers. The decline in quality in recent years is linked, in part, to poor crop husbandry, processing and handling by small-farmers, and the lack of premiums they receive for quality coffee. As a result, trees are neglected leading to further declines in quality.
12. The marketing system needs to be simplified to make it more efficient and action taken to brand and promote aggressively Tanzanian coffees worldwide. Market information needs to be communicated on a regular basis to farmers and others, and research undertaken to identify new marketing opportunities for Tanzanian coffees. This is the role of a restructured TCB, supported by the

Coffee Forum. TaCRI could have a role in market research and information dissemination to farmers groups.

13. *Processing*: the number of central pulperies needs to be increased and existing ones improved; farmers also need to be able to source appropriate and fuel efficient processing machines, for both hulling and pulping. There is a limited awareness and understanding by some farmers of the importance of quality control during processing (linked also to the lack of price incentives and current low returns).

14. Although the creation and maintenance of pulperies is not a function for TaCRI, it should, in association with other agencies, consider embracing post harvest technology in its portfolio of activities by, for example, developing a reference centre through which appropriate equipment can be identified and sourced from anywhere in the world. Training farmer and extension staff in processing techniques, including an awareness of quality related issues, is a high priority TaCRI activity.

15. *Production and inputs*: the major constraints contributing to low productivity are poor cultural practices, a high incidence of diseases and pests (and associated costs of control), old coffee trees (replanting with new, disease resistant cultivars is top priority) and frequent water stress. Limited knowledge within farmer groups of the technical and financial management skills needed to produce good quality coffee is due, in part, to poor linkages between research and extension, and the lack of clear messages. Poor husbandry skills, a lack of market awareness and limited access to credit lead to the inability to purchase inputs, low productivity, poor quality, low prices and reduced incomes. In addition, uneconomic farm sizes and competition from other farm and off-farm enterprises contribute to the decline in the production of quality coffee. It is no wonder that farmers are demoralised, and coffee farming is not attracting young people.

16. Once economics allow, a programme of replanting needs to be initiated in order (a) to reduce costs of production, and (b) to increase productivity per tree or per hectare, depending on the production system, without sacrificing quality. This depends on the availability of improved, disease resistant, high quality planting material, in sufficient quantities. For Arabica coffee, new cultivars need to be multiplied rapidly and tested in farmers' fields, and their value confirmed. A programme for replanting needs to be developed and linked to nursery provision.

17. For Robusta coffee, due to the low prevailing prices, there is at present no demand for planting material despite the availability of early maturing and high yielding clones from established nurseries. However coffee wilt disease, which is relatively new to Tanzania, continues to threaten the already weakened Robusta industry in the Kagera Region. No effective control measures are available, and no resistant varieties have yet been identified in Tanzania. Livelihoods are threatened. Regional links must continue to be pursued.

18. Coffee farmers need good, reliable advice if they are to remain in business, and to succeed in the future. The need for technology transfer services, which includes training of farmers (especially younger ones) and extension staff in coffee husbandry, primary processing, budget management (understanding the

true costs of production) and market awareness ('researchers must link farmers to the market') is widely recognised. Indeed, extension is given the highest priority by many stakeholders. As a matter of urgency, TaCRI must make available existing information in formats that are relevant, attractive, understandable and useful, building on the work of the CMU.

19. The technical research needs identified by stakeholders as being of immediate importance include: the continued development of high-yielding, disease resistant, high quality cultivars (both Arabica and Robusta), including their effective and rapid release for evaluation by farmers in different coffee based farming systems (ecological areas), cost effective integrated pest management systems, nutrient management (organic and inorganic), including the provision of soil and leaf analytical services (commercial), and primary processing technologies suitable for use at the farm level.

20. In addition, there is a need to understand and explain the economics of coffee production and processing, to influence policy makers, to support new marketing initiatives, and to understand the livelihoods of farming households to ensure that research is appropriate to their needs. TaCRI can seek to identify and document the minimum economic farm size, and to identify means of improving returns to farmers from coffee growing. This could include the creation of more farmer groups to share resources. The role of credit in making available inputs, such as inorganic fertilisers, to farmers is, for example, another researchable issue.

21. In short, this research area can be summarised under the title 'income security' to reflect the need to focus research on livelihoods dependent on cash to sustain them, and not just on technologies that may or may not be affordable. TaCRI needs to respond to this need although it has not been normal to include it in the mandate of traditional crop based research institutes in the past.

22. Whilst there is an urgent need to respond to the short term needs of the industry, particularly at such a difficult time, TaCRI researchers must not lose sight of the need to take a longer term view, and to anticipate the answers to questions that the industry may be asking in 10 years time. Each new cultivar is likely to have different optimum spacing and pruning regimes. These need to be assessed. Innovative techniques need to be explored. Progressive smallholders will, in the future, demand the most up to date techniques, as well as the estate sector.

INFRASTRUCTURE

23. It is important for TaCRI to operate from well-maintained modern facilities with appropriate resources for achieving its objectives. In general, the infrastructure at Lyamungu is run down as a result of years of neglect. The key resources that require rehabilitation or replacement have been identified and indicative costs, prior to detailed surveys being undertaken, included in the budget.

24. In addition to Lyamungu Coffee Research Centre, three TaCRI sub-stations are recommended: Ugano Coffee Research Sub-Station in Mbinga District, Ruvuma Region is well situated, with a modern training centre, to serve the south of the country. Similarly, it is recommended that ownership of the Mbimba station in Mbozi District is also transferred from Government, and that Mbimba becomes a

TaCRI sub-station serving farmers in Mbeya and adjacent regions. Land at Mbimba additional to the needs of TaCRI should be leased to farmers.

25. Although there is concern about the continued viability of Robusta coffee production in the Lake Zone, it is recommended that TaCRI undertakes research and training, focusing specifically on Robusta, at a new TaCRI sub-station closely associated with Maruku Agricultural Research Institute at Bukoba, in the Kagera Region

RESEARCH DEPARTMENTS and SUB-STATIONS

26. To undertake the priority activities identified in the stakeholder analysis, it is proposed that the following organisational structure is formed. This consists of five research departments based at Lyamungu in the north, and a technology transfer and training unit serving the whole country out of Lyamungu, Ugano and Mbimba in the south, and Maruku in the west. The research structure is largely for administrative convenience: multidisciplinary work is strongly encouraged:

    ♣ *Crop Improvement Department*:

    Function: to develop, evaluate, propagate and promote high yielding, disease resistant coffee cultivars (Arabica and Robusta) with good bean size and cup quality.

    ♣ *Crop Productivity and Primary Processing Department:*

    Function: to support the national coffee rehabilitation and replanting programme through effective research on crop husbandry practices and integrated pest management for the new coffee cultivars grown in contrasting farming systems; to provide information and to undertake research as necessary on primary processing technologies; to collate and interpret weather data from the principal coffee producing areas.

    ♣ *Crop Nutrition Department:*

    Function: to develop, evaluate and promote cost effective and appropriate integrated soil and nutrient management systems (inorganic and organic), with a focus on the new cultivars; to provide a high quality and reliable commercial analytical service to coffee farmers and supporting agencies.

    ♣ *Livelihoods and Income Security Department:*

    Function: to describe and understand the diverse farming and livelihood systems in the coffee growing areas of Tanzania, to identify and prioritise the constraints to productivity and profitability and to propose, evaluate and promote possible solutions.

    ♣ *Technology Transfer and Training Unit:*

    Function: to support the rejuvenation of the coffee industry by promoting and disseminating appropriate and financially viable, proven technologies to farmers and associated agencies; to facilitate an effective two-way linkage between researchers, district extension staff and farmers by encouraging, for example, the use of participatory research techniques; to support the development of nurseries

producing new cultivars for the replanting programme; to develop and deliver training courses (training the trainers); to promote market awareness and an appreciation of cup quality.

♣ *Ugano Coffee Research Sub-Station:*

Function: to support the development of the coffee industry in Ruvuma Region, and adjacent districts, by disseminating proven technologies to district extension staff, farmers and estates through the provision of training courses and by promoting extension messages; and, to support the central research programme by facilitating on-farm and on-station research. The officer-in-charge will report to the head of the Technology Transfer and Training Unit.

Note: transfer of ownership of land from the local cooperative society and from MAFS, including the disposal of surplus assets, needs to be agreed.

♣ *Mbimba Coffee Research Sub-Station:*

Function: to support the development of the coffee industry in Mbeya Region, and adjacent districts, by disseminating proven technologies to district extension staff, farmers and estates through the provision of training courses and by promoting extension messages; and, to support the central research programme by facilitating on-farm and on-station research. The officer-in-charge will report to the head of the Technology Transfer and Training Unit.

Note: transfer of ownership from MAFS, and disposal of surplus assets, needs to be agreed.

♣ *Maruku Coffee Research Sub-Station:*

Function: to serve the needs of coffee (principally Robusta) producers in western Tanzania by disseminating proven technologies to district extension staff, farmers and estates through the provision of training courses and by promoting extension messages; and, to support the central research programme by facilitating on-farm and on-station research. The officer-in-charge will report to the head of the Technology Transfer and Training Unit.

Note: a memorandum of understanding between MAFS and TaCRI needs to be prepared.

27. The Chief Executive Director will have administrative support from two teams of staff with the following functions:

♣ *Accounts and Personnel Team*:

Function: to support the activities of the research, and other, departments and sub-stations by efficiently managing all the financial (including STABEX funds) and personnel activities; to facilitate the effective decision making by senior staff by using the Management Information System to produce appropriate and timely information.

♣ *Site Management Team*

Function: to support the efficient operation of the Lyamungu Coffee Research Centre by managing all estate and farm activities including building and site

maintenance, research logistical support, bulk coffee production and coordination of the vehicle pool.

STAFF

28. The staff required to implement the work programme have been specified together with brief job descriptions of the senior posts. The underlying assumption is that TaCRI aims to be lean and efficient and should begin with the minimum number of staff needed to establish the work programme. It will be the responsibility of heads of department to make a case for an increase in staff based on the achievements to date, and the expected expansion in activities. Similarly, should some staff be surplus to requirements, or the skills required change, then the chief executive director should be informed. Everyone, regardless of position, must be prepared to undertake many tasks depending on the need at the time. For some, this will be a major cultural change. Appointment as Head of Department should be an additional post subject to review at three year intervals.

CAPACITY DEVELOPMENT

29. To enable staff to concentrate on the core activities, it is recommended that the production areas at Lyamungu be leased to commercial organisations. Advice, including a map for easy reference, is given on how this might be done. For similar reasons, the dairy herd should be sold.
30. At Ugano, the buildings need renovating, and furnishing, and communications improved through the installation of a telephone link. Negotiations should continue to obtain the title deeds for the 50 ha of land. Similarly, major renovation is needed to the infrastructure at Mbimba.
31. A pool system should be implemented to optimise the use of vehicles, and to prevent them from being too closely tied to individual departments.
32. A strategy for strengthening the information technology (IT) and management information systems (MIS) capabilities, through the purchase, and subsequent updating, of hardware (suitably specified), software and by continuing staff development, is presented.
33. Since it is expected that all staff will perform, an annual appraisal system should be introduced to monitor progress, and to support staff development. Payment of the annual performance bonus should be related to the achievement of targets, rather than granted as a right.
34. Continuing professional development for all staff can take a number of forms, including visits to other research organisations in the region and beyond, attendance at conferences and participation on internal and external short courses. Individual training needs should be identified during the annual appraisal.
35. There will be considerable demand from members of staff to enrol on postgraduate training courses. Whilst understandable, this could detract from the main objectives of TaCRI. A two-year moratorium on postgraduate training (MSc and PhD) is therefore recommended, whilst the strategic action plan is implemented. This will give time for the priority cases, and suitable projects, to be identified. TaCRI should not support undergraduate training.

36. The need to recruit new, high quality and enthusiastic staff has been identified (13 at a senior level). The appointment process needs to be initiated as soon as possible.

PARTNERSHIPS

37. A number of national (including local governments, the Ministry of Agriculture and Food Security, and universities), regional (including coffee research institutes in neighbouring countries) and international (including CIRAD in France and CIFC in Portugal) organizations have been identified as possible partners with whom TaCRI should seek to work. Estimates have been made in the budgets to facilitate these joint activities.
38. In particular, we recommend that TaCRI offers to host a conference/workshop, sponsored by the EU, and promoted by CORNET, with the aim of agreeing how best to establish effective regional links with the Coffee Research Foundation, Ruiru, Kenya, and the Coffee Research Institute, Kituza, Uganda. These are needed to facilitate (a) the provision of disease resistant cultivars (Arabica and Robusta), (b) staff exchanges and professional development, and (c) the development of joint research programmes (to avoid duplication of effort), all for mutual benefit.

FINANCIAL MANAGEMENT

39. In order to be sustainable, TaCRI must achieve its objectives within the financial limits imposed by the availability of income from the cess, likely to be variable from year to year, from commercial coffee production, and from the sale of plant material and other services. Donor funds such as those soon to be made available through STABEX cannot be relied upon, and should be used for specific projects with limited timescales.
40. The budget has been devised to allow TaCRI to undertake its core functions based on a prudent planning to ensure sustainability. By maximising the proportion of EU STABEX funds invested in the endowment fund, this approach is enhanced.
41. Using the information and assumptions on the expected income, resources have been allocated to reflect the diverse geographical spread of the coffee industry, and the priority activities identified in this report. Substantial funds have been allocated for the rehabilitation of Lyamungu Coffee Research Centre, and sub-stations, and for essential equipment required for the effective functioning of the research departments. These include provision for the information technology and management information systems needed to bring TaCRI into the 21st century for the benefit of the coffee industry.
42. The budget has been designed to return a small surplus to TaCRI each year. This is intended to provide a further safety margin against the volatility of cess income. Any surplus should be invested into a sinking fund from which both income and capital can be drawn should the need arise. A series of three-month bank deposits would ensure that money is available at reasonable notice.

COMMUNICATION

43. We recommend that TaCRI employs a communication/marketing specialist (on a short term basis) to help to develop a communication strategy appropriate to its short and long term needs. As an immediate action, the first annual report, highlighting what has been achieved since September 2001, needs to be written, published and distributed as soon as possible (e.g. by 1 July 2003).

CONCLUSION

44. We believe that by implementing this Strategic Action Plan, TaCRI has the opportunity to contribute to the rejuvenation of the coffee industry in Tanzania through appropriate participatory technology development and dissemination.

Research FOR development

THINKING BIG and ACTING BIG

Plate 2. TaCRI aims to develop and promote high quality, high yielding, disease resistant coffee varieties.

1 INTRODUCTION

1.1 Background

The Tanzania Coffee Research Institute (TaCRI) was incorporated as a company limited by guarantee in 2000 under the Companies Ordinance. With a Head Office at Lyamungu, Moshi (formerly known as Lyamungu Agricultural Research and Training Institute), TaCRI became legally constituted and operational in September 2001. At incorporation, it had access to sub-stations at Maruku (Lake Zone), Ugano and Mbimba (both in the Southern Highlands Zone).

The principal objectives of the Institute as stated in the Memorandum of Association are presented in Box 1.

Box 1. Principal objectives of the Tanzania Coffee Research Institute

1. To... carry out research… into all matters relating to coffee production, pulping, processing, curing, liquoring, quality, farming systems, and systems of husbandry of other crops as are associated with coffee... (a)
2. To extend the results of the research to coffee growers and the wide scientific community in the most appropriate ways… (b).
3. To…facilitate...all aspects of training and extension… (for the) coffee industry (c).
4. To establish and maintain...literature and scientific data…To disseminate information… (d).
5. To ... make known its activities and products... (e).
6. To collect…disseminate statistical and other information... relating to... the coffee (industry) (l).
7. To apply… for and accept grants with a view to promoting the objects of the Institute (m).
8. To regulate and control coffee pests and diseases (p).
9. To promote technological advancement in the coffee industry (q).
10. To provide consultancy and other technological advisory services to the coffee industry (r).

The letters in brackets refer to the order of listing in the Memorandum of Association. Words in brackets have been added for clarity

The Institute is governed by a Board of Directors. Initially, the Directors were appointed by the subscribers to the Memorandum and Articles of Association with the expectation that the directors will be confirmed at the (first) Annual General Meeting of the Institute. The Board consists of eight members drawn from the following institutions: Ministry of Agriculture and Food Security (one), Tanzania Coffee Board (one), Tanzania Coffee Association (one), Tanzania Coffee Growers Association (two), and smallholder farmer associations (three). In addition, the Board may co-opt a representative of the donor community, or an expert, to attend meetings (but with no voting rights).

Membership of the Institute (with voting rights at the Annual General Meetings) is open to representatives of the Ministry of Agriculture and Food Security, farmer groups and cooperatives, individual coffee growers, coffee traders and processors. Procedures have been specified by which prospective members (except for the Ministry of Agriculture and Food Security) apply formally to the Board for membership of the Institute through its secretary. (*It is not clear to the consultants how this process, and the associated*

voting rights of the stakeholders, will be implemented in practice. Should not all cess payers automatically be members? We recommend that the Memarts are revised).

Day to day responsibility for the management of the Institute is vested with the Chief Executive Director (who also serves as secretary to the Board). In addition, a Technical Advisory Panel appointed by the Board, and consisting of five eminent researchers and extension specialists in Tanzania, advises the Board on priorities for research, technology transfer and training, and reviews the annual budget prior to submission to the Board.

The Government is in the process of transferring to the Institute all existing assets, together with those committed under the STABEX and EU programmes, at the coffee research centres at Lyamungu, Uyole, Ugano and Maruku. The right to revenues from coffee sales that would otherwise have accrued to Government, plus any future donor funding that would have been channelled through Government, has been transferred to TaCRI.

Members of the Institute, except those representing Government, contribute to the funding of the Institute through a subscription cess or levy based on a percentage of the auction price in respect of producers (currently 0.75%, target 1.2%), and the FOB price in the case of exporters (not yet implemented). The levy imposed must be agreed, on the recommendation of the Tanzania Coffee Board (TCB), by the Government (Minister of Agriculture after consultation with the Ministers responsible for finance, and for marketing). The levy is collected by the TCB, which is then responsible for forwarding the money to the Institute within a specified (15 day) time period.

Although the Institute became operational in September 2001, new research activity has been limited pending the development and approval of a research strategy.

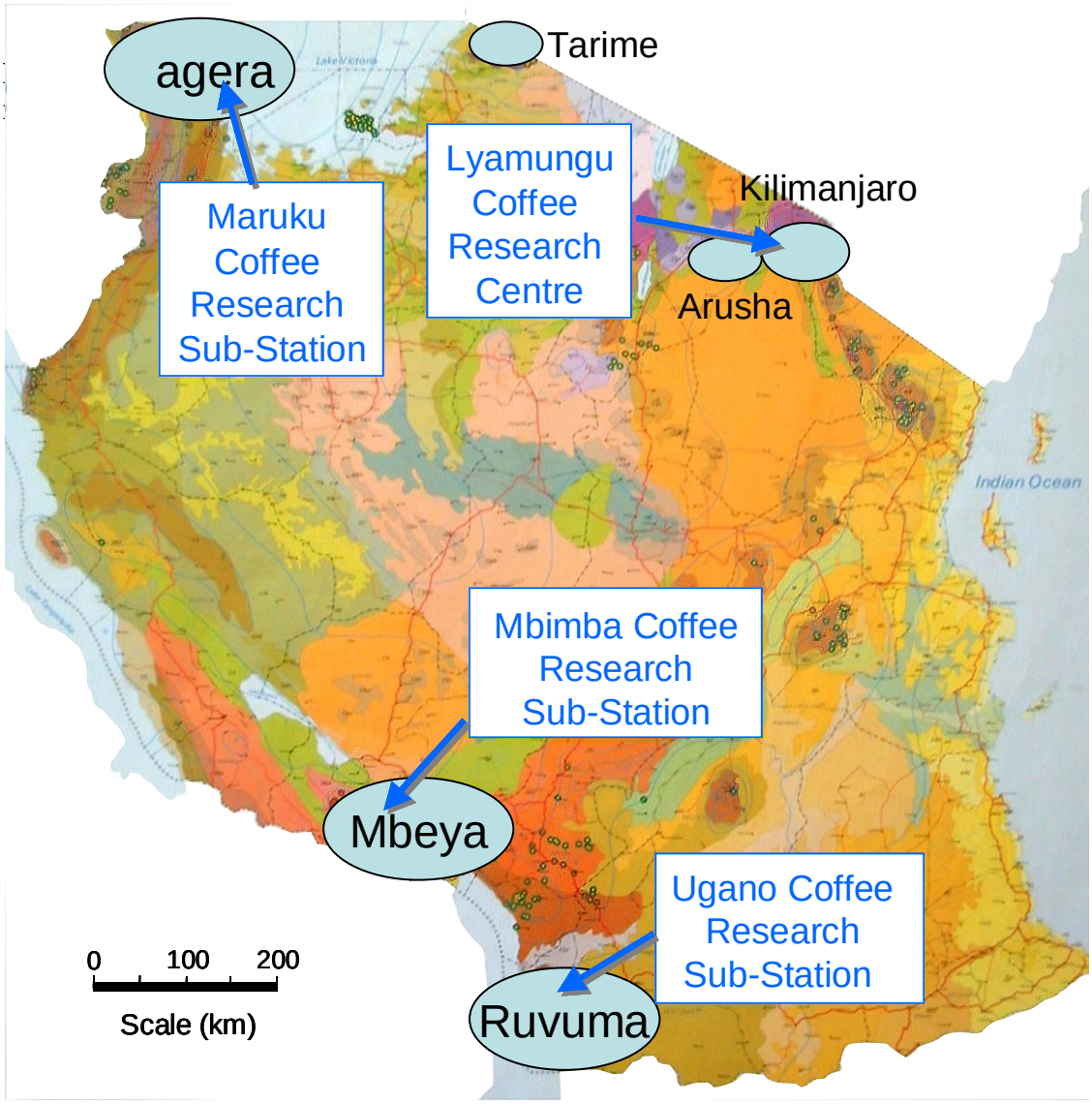
The objective of this consultancy was therefore 'to assist TaCRI in the formulation of a medium term (three to five years) research and development strategy (known as the Strategic Action Plan) in order to rejuvenate the Tanzania coffee industry through appropriate participatory technology development and dissemination'.

1.2 Methodology

Cranfield University at Silsoe (UK) was awarded the contract to assist TaCRI prepare the Strategic Action Plan in July 2002, and undertook the consultancy in three phases during July and August/September 2002, and in January 2003. The first part, known as the orientation phase, involved three principal activities: a synthesis of previous reports on coffee research in Tanzania; a country-wide stakeholder analysis; and preparations for a stakeholder workshop held in Moshi at the start of the second, or implementation, phase. From this workshop, the priority activities to be undertaken by TaCRI, as identified by diverse stakeholders, were identified. After reviewing the impact of previous research at Lyamungu and its sub-stations, and meetings with staff an organisational structure for TaCRI was developed. This was based on the priority activities, previously identified, together with the expected availability of financial (cess, STABEX support, and other income), human (staff), social (other stakeholders), natural (farms) and physical (infrastructure) capital at Lyamungu and elsewhere. The need for capacity building (staff and infrastructure development, including information technology and management information systems) to support the successful implementation of these activities was also assessed. The benefits to the industry of TaCRI seeking to work in partnership with other national, regional and international

organisations were also considered. Finally, under the heading of financial management, draft annual budgets were prepared. The draft report was submitted to the Board of Directors and the European Union in September 2002 for comment. Following feedback, revisions were incorporated into the report, and additional work completed in January 2003. The report was presented to a meeting of the Board held on 20 January 2003

The remainder of this document follows the sequence of reporting described above. The Annexes, which follow include action plans for each department, a comprehensive logical framework for TaCRI, with outputs and activities for each department, and detailed annual budgets for each of the next five years. The executive summary, together with the action plans, the logical framework and summary budget, make up the summary Strategic Action Plan.



2 SYNTHESIS OF PREVIOUS REPORTS

Over the last 12 years or so, a large number of reports have been written about the coffee industry in Tanzania. Some are quite specific others are more general. In this chapter, salient points from each report are summarised highlighting, in particular, those issues that are pertinent to the present study. They are listed under three headings, policy related, financial, and research. The research section is expanded in chapter 4.

2.1 Policy related reports

Coffee Industry Act 2001

This Act, published in 2002, seeks to make better provisions for the regulation, improvement and development of the Coffee Industry, to re-establish the Tanzania Coffee Board (TCB), to repeal the Tanzania Coffee Board Act of 1984 and to provide for related matters.

In this section, the principal functions of the TCB are summarised, particularly those that may overlap with, or impact on, the role and function of TaCRI (Box 2).

Box 2. Some of the functions of the Tanzania Coffee Board

1. To advise the Government on policies and strategies for the development of the coffee industry… (a).
2. To promote the development of coffee production, processing and marketing (b).
3. To make regulations governing the cultivation and marketing arrangements of coffee… (c).
4. To provide financial support to coffee research and development … (d).
5. To promote technological advancement in the coffee industry (h).
6. To provide consultancy and technical advisory services…
7. To represent the industry in the national and international fora dealing with the coffee industry (n and o).

Numbers or letters in brackets at the end of sentences refer to the corresponding section in the Act.

In addition the Act states that:

'The Board shall keep a register of all land planted with coffee and of owners, occupiers and managers thereof and of all buildings used… for processing…' (7(1)).

'The Director (of the department responsible in the Ministry of Agriculture and Food Security) shall prescribe types and varieties of coffee to be grown in different parts of Tanzania' (8(1)).

'No person shall import, breed or multiply coffee seeds or seedlings or plants for any purpose unless authorised by the Director' (9(1)). (With serious penalties specified (9.2)).

'The Board shall subject to the approval of the Minister make rules and regulations for better farming husbandry of coffee' (11).

'The Board shall have power to appoint... coffee inspectors who shall have powers…. to supervise the arrangements for the cultivation, purchase, export and import of coffee' (18).

'There shall be raised… a coffee levy at such a rate recommended by the Board after consultation with the Minister...' (29(1)).

'The Board shall establish… a 'Coffee Industry Development Fund' into which moneys realised from the levy shall be paid' (31(1)).

'The purpose of the Fund shall include financing the following activities: (a) price stabilization support; (b) extension services support; (c) marketing, promotion; (d) payment for the cost of administering the Fund, and (e) such other activity relating to the development and promotion of the coffee industry as may be deemed fit by the Fund Committee' (31(4)).

'The Fund Committee shall consist of five members who shall be appointed by the Minister on the recommendation of the Board' (32(1)).

'The Board of Directors shall consist of seven members: a chairman appointed by the President on the advice of the Minister; one member… from the Tanzania Coffee Association; one member… from the Association of Coffee Growers; three members from the three major coffee zones recommended by the respective Cooperative Unions, and one member representing the Ministry' (Schedule, made under section 3(2)).

It should be noted that nowhere in the Act is mention made of TaCRI, including any guarantee of its funding arrangements through the levy. Although the TCB is represented on the TaCRI Board of Directors, there is no reciprocal arrangement. *We recommend* that the Coffee Act is reviewed.

Coffee Sector Strategy 2001/2006

This report, prepared for the Tanzania Coffee Board in 2001 by Business Care Services, Dar es Salaam reviews progress during the implementation of the 1998 Coffee Sector Strategy paper and describes the strategy for further developing the sector over the period 2001 to 2006.

Highlights of the implementation phase identified included:

- an increase in coffee production over the period 1997/98 to 2000/01 (from 38 to 58 million tonnes, from an *estimated* 250,000 ha),
- the distribution of some 13 million coffee seedlings to farmers (supported in part by the Coffee and STABEX Management Unit),
- the provision of Robusta clones to farmers in Kagera Region, and the production of new disease resistant Arabica clones through in-vitro propagation (with the assistance of CIRAD, France),
- the rehabilitation of some coffee estates, through leasing or sale to private farmers, and expansion of coffee growing areas,
- increased private sector involvement in primary and secondary processing facilities, and
- some improvement in the regulatory framework.

Disappointments included:

- delays in establishing TaCRI, and
- failure to import improved hybrid Arabica cultivars from Kenya (refusal by Kenya authorities), and a Robusta clone from Uganda (no approval from MAFS).

The new developments since 1998 included:

- a dramatic fall in farm gate prices from TSh 1500/= per kg of parchment in 1997/98 to TSh 500/= in 2000/01 for Arabica, and from TSh 325/= per kg to TSh 80/= for Robusta over the same period,
- the formation (in 2001) of a new Ministry of Cooperatives and Marketing, a move intended to strengthen the cooperatives as well as marketing activities within and outside the country, and
- the TCB plan to install (in 2002) an automatic auction machine at Moshi to increase competition between buyers and so improve prices.

The TCB Strategic Plan for the next five years (to 2006) focuses on the theme of 'Improving the income of coffee farmers' through sustained production of quality coffee with a target production 100,000 t by 2006. This would be achieved by:

- 'improvements in marketing…
- developing (international) markets for speciality coffees realising premium prices… whilst promoting increased consumption internally,
- improving the quality of coffee produced (by diverse means),
- improving yields by replanting in both Arabica and Robusta production areas, better crop husbandry methods, intensified extension services, improved access to credit for inputs and capital investments, and education and training of farmers,
- improving the rural infrastructure… in order to reduce transport costs to farmers,
- promoting and/or strengthening farmer organisations… , and
- strengthening the role of the TCB as a regulator as well as encouraging the private sector (and others) to (contribute to) the development of the sector.'

Although different organisations responsible for delivering these ambitious and worthy objectives are identified, there is no indication of how they will actually be achieved. TaCRI is associated directly or indirectly with many of these activities, but without consideration of the availability of resources or prioritisation.

Coffee Sector Strategy Study, Tanzania, 1998

This long and detailed review was undertaken by Agrisystems (Overseas) Ltd on behalf of the Government of Tanzania and the European Union. It reports on:

The Government's economic and sector policies, including the contribution of coffee to the economy of Tanzania,

1. *Features of, and constraints in, the coffee sector*, including the demand for Tanzanian coffees, industry identified constraints, production and yields, extension services, inputs, finance and credit, planting materials, research,

marketing chain and quality, taxation, duties, cesses and levies, and processing and coffee quality.

2. *Beneficiaries and parties involved,* including smallholder and estate sector issues, and the role of supporting institutions.

Constraints leading to low returns to coffee farmers, identified by participants at a workshop, were summarised in the form of a detailed problem tree.

Although this is a very comprehensive report, it is not easy to distil the principal conclusions or actions proposed. On the subject of research, the report concluded that it was weak and ineffective, and that it was failing (a) to provide farmers with high yielding, good quality varieties, which were resistant to the main diseases, (b) to develop cost effective technical packages for use by extension workers, or (c) to train farmers (for full details see appendix F of the Agrisytems report). The report supported the formation of an autonomous organisation, as proposed by Coopers and Lybrand in 1997, accountable to the sector and financially independent (of Government?). Similar concerns were expressed about the quality of the extension services available to farmers.

'Coffee markets in East Africa: local responses to global challenges or global responses to local challenges' by Stefano Ponte (2001)

This paper, prepared for the Centre for Development Research in Copenhagen, Denmark, compares and contrasts the coffee marketing chains in three East African countries, Kenya, Tanzania and Uganda following liberalization. It highlights the risks that Tanzanian coffees, without quality price incentives to small-farmers, will be increasingly marginalized from the high-quality end of the international market. The speciality market (e.g. Fair Trade, organic, shade grown and bird-friendly) offers opportunities for some producers, but any long-term solution needs to target the mainstream market as well through, for example, the education of the consumer and the promotion of brands (as with the wine industry). Tanzania, without the benefits of large scale, low cost production, must not become locked into the 'fair average quality' end of the market.

The World Bank report on the coffee industry in Tanzania (2002)

This detailed report assesses the impact of policy reforms introduced in Tanzania since 1990 on the prospects for the coffee industry, within the constraints of the long- term outlook for the global market. Many problems remain, and it is not yet clear whether the sector will recover or continue its long-term decline. The policy changes needed to aid recovery at a time of low world prices are identified. The report concludes that, for Tanzania to compete internationally, yields must be increased in order to reduce the unit costs of production, and quality improved. Doubt is raised about the accuracy of the Tanzania Coffee Board production and export sales data.

2.2 Financial reports

PriceWaterhouseCoopers report (2000)

The report presents alternative scenarios on staffing and financing of TaCRI, based on assumptions of national production trends, coffee prices and cess rates. It was assumed that all substations would be maintained. Estimates were based on two alternative staffing levels, namely with and without District Coffee Extension Officers (DCEO).

The report recommends the employment of the DCEOs only if they "have an impact on productivity based on existing stock and production methods" since otherwise TaCRI's reputation may be tarnished. However, without effective technology transfer and training the impact of TaCRI will be minimal and it will not be able to fulfil its mandate.

The report also considers the options for the commercial production areas on Lyamungu Coffee Research Station and recommends that they should be leased or operated as a joint venture.

The PriceWaterhouseCoopers' report provides detailed financial planning information but this is based on assumptions about structure and salary levels, which are likely to change. They can therefore only be used as a guide. Many of the costings appear to have been taken directly from the Government of Tanzania/CIRAD 1994 report.

2.3 Research reports

The coffee consultancy reports prepared by Wrigley (1989), Snoeck *et al.* (1991), GoT/CIRAD (1994), Eskes (1997), Agrisystems (1998), Berthouly (1995, 1999) and Charmetant (2001) have extensively addressed coffee research in Tanzania, or have considered specific issues. In general, the emphasis has been on Arabica coffee, but Robusta coffee in the Kagera region has also been considered. These reports have been studied, together with annual and other internal reports produced by the coffee research station at Lyamungu (now TaCRI). Some of the conclusions and recommendations, particularly those that have already been implemented in the research programmes, or are still relevant to the much-changed present situation, have been integrated in the review and evaluation of previous research described in chapter 4. A full list of all reports is presented under References in Annex 8.

3 STAKEHOLDER ANALYSIS

The stakeholder analysis was undertaken in two parts. Firstly, by a series of visits and interviews throughout the country during the two-week orientation phase, and afterwards through a two-day workshop held in Moshi.[1]

3.1 Visits and interviews

During the inception phase, visits were made to stakeholders in the north (Arusha and Kilimanjaro Regions), the south (Mbinga District in the Ruvuma Region), Dar es Salaam, and the West Lake (Bukoba District in Kagera Region). The people interviewed included farmers, estate managers, processors, an exporter of speciality coffees, the Tanzania Coffee Board, District Council officials, District and Regional Commissioners, the Coffee Management Unit, the National Authorising Office, Ministry of Agriculture and Food Security, staff at Ugano Coffee Research Sub-Station and the Maruku Agricultural Research Institute, the Kilimanjaro Native and Kagera Cooperative Unions, and an NGO (Mayawa). Meetings were also held with the chairman of the TaCRI Board and with senior TaCRI staff. A clear and generally consistent overview of the state of the coffee industry in Tanzania was obtained, and of the role that TaCRI could/should play emerged. The principal issues raised by stakeholders were summarised under four headings, external (or policy) environment, producers, technology transfer and training, and research (see Annex 5).

Plate 3. Seeking the views of stakeholders in Kagera: July 2002.

[1] The team leader also visited Mbozi District, including Mbimba Research Station, and the Tanzania Meteorological Agency, the EU, the CMU and the MAFS in Dar es Salaam, in November 2002.

3.2 Workshop

In order to ensure that the views of the coffee industry stakeholders were taken fully into account, and that there was, as far as possible, agreement on the issues of concern and the action needed to address them, TaCRI, in association with the consultants, organised a stakeholder workshop in Moshi. The purpose of this two-day event was to identify and agree the priority research, extension and training activities to be undertaken by TaCRI, in partnership with other stakeholders, over the next five years.

A broad representation of stakeholders participated from all sectors of the industry and all parts of the country.

The key outputs from the workshop were:

1. Identification and prioritisation of policy, farm level, technology transfer and other constraints to the development of the coffee industry.
2. Identification and prioritisation of actions needed to overcome the constraints.
3. Identification of priority research for development, technology transfer and training activities to be undertaken by TaCRI and other agencies.

A report summarising the purpose of the workshop, the list of delegates and their affiliation, and the proceedings, including recommended actions, is appended as Annex 6. The constraints and actions identified and prioritised by the participants were reported under five headings: policy environment; markets, marketing and trade, processing and quality control; production; and inputs.

Plate 4. Group discussion on constraints to the coffee industry: August 2002.

3.3 Conclusions: priority activities

The priority activities to be undertaken by TaCRI alone, or in association with others, as identified during both the stakeholder analysis and the following workshop are summarised below:

3.3.1 Policy environment

- *Constraints*: the importance of the policy environment in which the coffee sector operates was strongly emphasised. Current problems are linked not only to low world prices, but also to low quality, poor promotion and marketing, high taxation and sundry deductions reducing the price paid to farmers, the role of the TCB, the auction, current licensing constraints (leading in part to extended, and costly, marketing chains), the bad reputation of the co-operative unions, lack of access to credit by farmers, the poor state of rural roads and water supplies, the cost of sisal bags, access to ports and uncompetitive handling charges (for example, c.f. Uganda). Research cannot be effective, and the industry will not recover, until many of these constraints are overcome or minimised.
- *Action proposed: we recommend* that an independent, effective and representative stakeholder forum based on the Annual Coffee Conference should immediately be constituted. This forum (hereafter called the Coffee Forum) should work with Government to conduct an urgent review of existing policies and regulations relating to coffee, including the role and structure of the Tanzania Coffee Board, in order to identify the actions that need to be taken to resolve these issues. The question of subsidies to farmers at this difficult time could also be considered. Since TaCRI, as constituted, represents all stakeholders, *it is recommended* that the TaCRI Board of Directors takes the initiative by offering, and being supported, to provide the Secretariat for the Coffee Forum. In the longer term TaCRI, as it develops its credibility with the industry through effective research and technology transfer, can provide advice on policy issues to Government through the Forum.

3.3.2 Marketing

- *Constraints:* Tanzania must develop/enhance its reputation for producing quality coffee consistently in large enough quantities to attract buyers. The decline in quality in recent years is linked, in part, to poor processing by small-farmers, and the lack of premiums they receive for quality coffee. As a result, trees are neglected leading to further declines in quality. Unscrupulous traders, taking advantage of farmers' need for cash in hand, contribute to this situation. Related constraints are the over-regulated marketing system, the lack of aggressive marketing of Tanzanian coffee and the lack of transparency of the existing auction system. The limited availability of market information to farmers and lack of market research are also seen as constraints. Speciality marketing and branding are seen as possible ways forward.
- *Actions:* the marketing system needs to be simplified to make it more efficient, and action taken to brand and promote aggressively Tanzanian coffees worldwide. Market information needs to be communicated on a regular basis to farmers and others, and research undertaken to identify new marketing opportunities for Tanzanian coffees. This is the role of a restructured TCB, supported by the Coffee Forum. TaCRI could have a role in market research and information dissemination to farmer groups.

3.3.3 Processing

- *Constraints:* the number of central pulperies needs to be increased and the state of repair of existing ones improved (for both washed and hard coffees); farmers also need to be able to source appropriate and fuel efficient processing machines; there is also a shortage of water for processing in some areas. There is a limited awareness and understanding by some farmers of the importance of quality control during processing (linked also to the lack of price incentives and current low returns). The use of coffee by-products, when not returned to the field, is also considered to be a researchable issue.
- *Actions:* the creation and maintenance of pulperies is not a function for TaCRI. However, TaCRI, in association with other agencies (e.g. University of Dar es Salaam, Engineering Department and/or Sokoine University of Agriculture, Agricultural Engineering Department), should consider embracing post harvest technology in its portfolio of activities by, for example, developing a reference centre through which appropriate equipment can be identified and sourced from anywhere in the world. Training farmer and extension staff in processing techniques, including an awareness of quality related issues, needs to be a high priority TaCRI activity.

Plate 5. Homemade primary processing equipment: July 2002.

3.3.4 Production and inputs

- *Constraints:* the major constraints contributing to low productivity are poor cultural practices, a high incidence of pests and diseases (and associated costs of control), old coffee trees (replanting with new, disease resistant cultivars is top priority) and frequent water stress. Limited knowledge within farmer groups of the technical and financial management skills needed to produce good quality coffee is due, in part, to poor linkages between research and extension, and the lack of clear messages. Poor husbandry skills, a lack of market awareness and limited access to credit lead to the inability to purchase inputs, low productivity, poor quality, low prices and reduced incomes. In addition, uneconomic farm

sizes and competition from other farm and off-farm enterprises contribute to the decline in the production of quality coffee. It is no wonder that small-farmers are demoralised, and coffee farming is not attracting young people.

- *Actions:* once economics allow, a programme of replanting needs to be initiated as soon as possible in order (a) to reduce costs of production, and (b) to increase productivity per tree or per hectare, depending on the production system, without sacrificing quality. This depends on the availability of improved, disease resistant, high quality planting material, in sufficient quantities. For Arabica coffee, new cultivars need to be multiplied rapidly and tested in farmers' fields, and their value confirmed. A programme for replanting needs to be developed and linked to nursery provision. For Robusta coffee, due to the low prevailing prices, there is at present no demand for planting material despite the availability of early maturing and high yielding clones from established nurseries. However coffee wilt disease, which is relatively new to Tanzania, continues to threaten the already weakened Robusta industry in the Kagera Region. No effective control measures are available, and no resistant varieties have yet been identified in Tanzania. Livelihoods are threatened. Regional links are being pursued.

  Because of cost, few farmers are applying inorganic fertilisers, but some continue to apply organic manures (FYM, composts) subject to availability on the farm or, in some cases, purchased from suppliers. Mulch is widely used where available, and when there is no risk of fire. Some farmers are experimenting with the use of natural pesticides (integrated pest management). These are all topics that require technical support from TaCRI and other agencies.

  Coffee farmers need good, reliable advice if they are to remain in business, and to succeed in the future. The need for technology transfer services, which includes training of farmers (especially younger ones) and extension staff in coffee husbandry, primary processing, budget management (understanding the true costs of production) and market awareness ('researchers must link farmers to the market') is widely recognised. Indeed, extension is given the highest priority by many stakeholders. As a matter of urgency, TaCRI must make available existing information in formats that are relevant, attractive, understandable and useful, building on the work of the Coffee Management Unit (CMU).

3.3.5 Conclusions

- Research can only be effective, and chances of uptake improved, if the policy environment is supportive, if farmers are in a position to implement the outputs of research (and have confidence in their reliability and value), and if there is an effective delivery mechanism through an appropriate extension service, or direct to the farmer by researchers. It is also a two-way process, with information flows in the opposite direction. Researchers need to understand policy issues, marketing constraints and opportunities, the livelihood systems of farming households (e.g. access to capital in its various forms[2]), and hence the relevance of the research in terms of the needs of farmers.
- Technical research needs identified by stakeholders as being of immediate importance included: the continued development of disease resistant, high

[2] Human, social, physical, natural and financial

quality cultivars (both Arabica and Robusta), including their effective and rapid release for evaluation by farmers in different coffee based farming systems (ecological areas), cost effective integrated pest management systems, nutrient management (organic and inorganic), including the provision of soil and leaf analytical services (commercial), and primary processing technologies suitable for use at the farm level.

- In addition, there is a need to understand and explain the economics of coffee production and processing, to influence policy makers, to support new marketing initiatives, and to understand the livelihoods of farming households to ensure that research is appropriate to their needs. TaCRI can seek to identify and document the minimum economic farm size, and to identify means of improving returns to farmers from coffee growing. This could include the creation of more farmer groups to share resources. The role of credit in making available inputs, such as inorganic fertilisers, to farmers is, for example, another researchable issue. In short, this research area can be summarised under the title 'income security' to reflect the need to focus research on livelihoods dependent on cash to sustain them, and not just on technologies that may or may not be affordable. *TaCRI needs to respond to this need although it has not been normal to include it in the mandate of traditional crop based research institutes in the past.*
- Whilst there is an urgent need to respond to the short term requirements of the industry, particularly at such a difficult time, TaCRI researchers must not lose sight of the need to take a longer term view, and to anticipate the answers to questions that the industry may be asking in 10 years time. The need for new cultivars will continue. These can be sourced from germplasm collected from many parts of the world, subject to agreement, and then exploited for use in Tanzania. Each new cultivar is likely to have different optimum spacing and pruning regimes. These need to be assessed. Innovative techniques need to be explored. Progressive smallholders will, in the future, demand the most up to date techniques, as well as the estate sector.
- Research is not just about new discoveries. It is also about reviewing, reinterpreting and representing old information in ways that are of value today. Much good work has been done in the past at Lyamungu, its sub-stations, and in neighbouring countries. TaCRI scientists need to be familiar with this research as well as with current work elsewhere in the world. Easy access to the literature through modern information retrieval systems is essential.

4 REVIEW OF PREVIOUS RESEARCH

In this section, the contribution of previous and on-going research at Lyamungu is briefly reviewed, with the aim of identifying priorities for future work. This has been based on discussions with the heads of departments, previous annual reports, the latest of which was for the year 1995, recent internal reports, including those prepared for the Technical Advisory Panel and reports prepared by other consultants.

4.1 Plant breeding and variety development

Among the many socio-economic and technical constraints encountered by the Arabica coffee growers, coffee berry disease (CBD) and coffee leaf rust (CLR) constitute a real threat to the long-term survival of the Tanzanian coffee industry. The development of new Arabica cultivars with high and durable resistance to these two fungal diseases is unanimously seen as the most important target for the breeding programme at Lyamungu. Evidently, the new cultivars should also be high yielding, but more specifically have bean and liquor characteristics at least similar to the best traditional cultivars (e.g. N39) to enable the Tanzanian coffee industry to maintain or recapture its special place at the top end of the world coffee market.

Since the first outbreak of CBD on Mount Kilimanjaro in 1966, a breeding programme has been in progress. This gradually increased in complexity (from single to multiple and back crosses) in an effort to recombine all the required characteristics of disease resistance yield and quality in one genotype. While appreciating the soundness of the main objectives, the protracted duration of the programme (> 35 years), with only recent evidence for potentially useful end products in the form of clonal cultivars, has come under repeated criticism. A few of the candidate clones certainly have host resistance to CBD and CLR, good yield potential and bean size, and promising liquor quality.

Nevertheless, there is considerable agreement on the need for immediate mass multiplication (by traditional and advanced methods of vegetative propagation) of some five to eight of the likely best selections for release to growers under certain restrictions. This will serve two main purposes: (1) to show coffee growers that the breeding programme at Lyamungu has finally achieved its target of developing new disease resistant planting material and (2) to get early feed-back on their performance on-farm (yield and disease resistance) and in the coffee market (bean and liquor quality).

There is still opportunity for further progress by continued selection amongst more advanced breeding populations (e.g. the 1986-88 crosses), particularly in regard to quality. Compact growth of coffee trees has many advantages in crop management and is well suited to higher density planting for the purpose of increasing productivity per unit area. Such cultivars have gained considerable popularity with Arabica coffee growers all over the world, especially if this is combined with resistance to diseases (CLR and sometimes also CBD) as for instance in several Catimor lines. Coffee growers in Tanzania have also expressed their interest in compact growing cultivars, but so far the breeding programme at Lyamungu has not made much progress in that direction. Some Catimor lines of various origins have been introduced over the past decade and are now available on-station at Lyamungu and also on a few nearby estates. Clonally propagated hybrids between selected plants of certain Catimor lines and of the most advanced multiple and backcrosses of Lyamungu could well lead to compact growing cultivars with all the requirements for the Tanzanian coffee growers, i.e. resistance to CBD and CLR, high yields (per ha) and good quality of bean and liquor.

The seriousness of nematode infestations to Arabica coffee in Tanzania still requires further investigation before including host resistance to nematodes into future breeding programmes. Research results from Central America indicate that selections of the variety Hibrido de Timor (progenitor for CLR and CBD resistance) and also accessions from Ethiopia exhibit resistance to certain species of *Meloidogyne* rootknot nematodes. An alternative solution is the use of nematode-resistant Robusta rootstock, but not in the higher-altitude areas because of poor adaptation of Robusta plants to cool climates. Nematode-free nurseries and strict phytosanitary control to prevent the distribution of infested coffee plants to coffee farms may be an effective and less costly way of reducing this pest problem.

Recommendations made in certain external reports to initiate selection and breeding for insect pests are not realistic, because host resistance to such pests such as leaf miners has only been found in exotic diploid species, which would require a lengthy programme of interspecific hybridisation with an uncertain outcome. However, considerable biotechnological progress has been made recently in obtaining plants of Arabica as well as Robusta coffee with resistance to leaf miners and the coffee berry borer. The resistance of such genetically modified (GM) plants is based mainly on Bt-genes. Incorporation of such germplasm into the breeding programme will depend on national and international regulations and public acceptance of GM cultivars.

Fusarium wilt or tracheomycosis caused by the fungus *Fusarium xylarioides* is becoming a major crop-limiting factor for Robusta coffee in the Kagera region. The predominant Nganda or bending type is particularly susceptible. Some of the Ugandan clonal cultivars of the erect Robusta type have remained resistant. Proposals were made in 1995 for multiplication of these clones (rooted cuttings and even by somatic embryogenesis). There was also a plan for further selection and breeding for improved Robusta clones at Maruku Agricultural Research Institute. Not much progress has been made so far, although nurseries have been established, partly because farmers' acceptance of such plant material has been low due to the low prevailing prices.

4.2 Propagation

Traditional methods of propagating clonal cultivars by rooted cuttings or grafting may give satisfactory multiplication rates in the case of Robusta coffee. However, these are too inefficient for Arabica coffee beyond the stage of initial multiplication of promising selections for multi-location trials, on-farm testing and limited distribution of the most promising new clonal cultivars to interested coffee growers prior to their formal release to the coffee industry.

In-vitro propagation based on somatic embryogenesis has been successfully converted into a rapid technique of mass propagation by CIRAD (Montpellier, France) using a patented device (RITA) of temporary immersion of the developing embryos. It has already been tested with some success on new Arabica hybrids in Guatemala and other Central American countries. With the assistance of CIRAD, Lyamungu implemented a pilot project in 1999 to multiply a limited number of trees from selected hybrid families. About 100,000 embryos produced in the tissue culture laboratory of CIRAD at Montpellier were transferred back to Lyamungu. The low recovery rate of 20% in transplantable coffee plants was due to many technical and organisational problems (including long-distance transfer of the embryos), which could be avoided in future, but the exercise clearly demonstrated the potential viability of this rapid method of clonal propagation.

A proposal was made to delegate the technical and organisational responsibilities of propagation and nurseries to a special unit separate from the breeding department. It was also suggested that a small tissue culture laboratory should be established at Lyamungu for initial testing of clones for adaptability to somatic embryogenesis and small-scale multiplication for research purposes. The mass propagation of new clonal cultivars should be contracted out to a commercial tissue culture laboratory.

4.3 Plant pathology

The main focus of plant pathology has rightly shifted from chemical disease control and screening of new fungicides to supporting the breeding programme in screening for host resistance to the main diseases CBD and CLR. This entails recording of variation in field resistance of individual trees in selection trials and screening tests by inoculation on berries and hypocotyl stems of six-week old seedlings (CBD) or leaf discs (CLR). From the available data it appears that this enormous amount of work has been carried out with care and has generally produced reliable and consistent information, enabling the breeders to select genotypes with the required levels of field resistance to both diseases. Monitoring for other diseases remains the responsibility of plant pathology, but with the presently limited resources, this should not be given high priority at the moment.

Plate 6. The CED discusses progress of one-year old plants of new disease resistant varieties grown in an observation trial under estate management: Lyamungu, January 2003.

Contradictory recommendations on the methodology for screening tests using artificial inoculation for CBD resistance, as presented in different external reports, may have caused some confusion with the plant pathologists at Lyamungu on methods to be followed and interpretation of results. The inoculation tests are only a means of

achieving the main objective, which is to identify with great precision plants that will be highly and consistently resistant to CBD in the field. When carrying out the inoculation tests, *we recommend* strict application of the protocols originally developed by the Coffee Research Foundation in Kenya, since these produce results closely related to field performance.

Methodologies applied elsewhere (e.g. CIRAD in France and CIFC in Portugal) deviate in essential points, particularly in the case of the inoculation test on hypocotyl stems, and may lead to conclusions that bear little or no relation to field performance in the country of origin of the plant material. For instance, the CIFC have claimed that new virulent races of the CBD pathogen have already developed, but this is really only variation in aggressiveness between CBD isolates from different coffee regions, as recently reconfirmed by coffee pathologists in Cameroon (Van der Vossen, 2001). New virulent races, as are common in CLR, have fortunately not yet appeared in CBD and the present levels of resistance present in Tanzanian breeding populations are very likely to give full and durable protection against CBD attacks under field conditions. Continued co-operation with CIRAD can be fruitful for several reasons, but the pathologists at Lyamungu should be free to choose screening methodology appropriate to local conditions.

In regard to CLR resistance, the inoculation test on leaf-discs (developed by A. B. Eskes in Brazil in the 1970s) has proven to be a very useful laboratory test complementary to field scoring, but it was never adopted by CIFC. Nevertheless, cooperation with CIFC should be very beneficial in respect of monitoring the potential development of new CLR races in Tanzania and also verification of SH resistant genes present in advanced breeding material from Lyamungu, as CIFC is the only research institute maintaining a complete set of CLR races, called 'differential clones'. However, one should bear in mind that the present level of CLR resistance found in many breeding populations of Lyamungu is more than adequate for Arabica coffee grown in Tanzania.

Plate 7. A farmer in Kagera explains the effects of coffee wilt disease: July 2002.

4.4 Entomology and nematology

In the apparent absence of host resistance to any of the major insect pests and the low priority to be given to screening new insecticides the main focus of entomology should remain on integrated pest management (IPM) based on monitoring the build-up of pest populations and their natural enemies, insect traps and other biological means of keeping insect pests below economically acceptable threshold values. Much information is available from work in other coffee producing countries (e.g. leafminer, scales and Antestia bug in Kenya; coffee berry borer and white stem borer in India and Colombia), which could be applied with some modification in Tanzania.

Screening for resistance to nematodes in breeding populations is useful, but will have to be preceded by accurate determination of the species that are causing most problems. Anyway, this is research of a truly long-term nature and the greatest priority should be given to monitoring nurseries and plant material used for planting to prevent a rapid spread and aggravation of nematode infestations in new and old coffee growing areas.

4.5 Soil and plant nutrition

Notwithstanding the increasing lack of essential laboratory chemicals, spare parts to maintain equipment and even fertilizers, the soil and plant nutrition department has continued to carry out its dual function of undertaking research and providing diagnostic services quite well until fairly recently.

Some research projects to study the mineral nutrition required for sustainable coffee production under different ecological and cultural conditions have produced experimental evidence to support interesting conclusions, such as: (1) the locally available Mijingu rock phosphate is an equally effective and less expensive alternative to the imported triple super phosphate; coffee yield responses to P are highly significant for several Tanzanian soil types; (2) uptake of N-fertilizers is more efficient in high-density coffee (3200 trees/ha) with a standard (tall) cultivar; (3) multi-location NPK fertilizer trials show varying yield responses, depending on soil type and fertility status; for cost effective fertilizer application annual doses should be related to the current crop expectation (efficient management).

Diagnostic services to the coffee growers have continued as far as limited resources permitted. In contrast to the views of certain external consultants, the crop nutritionist at Lyamungu rightly bases his fertilizer recommendations to the growers on soil and leaf analysis data, analogous to the Coffee Research Foundation in Kenya.

Interesting new project proposals include: (1) determining the optimum combination of organic and inorganic fertilizers for sustainable Arabica coffee production; (2) soil conservation and fertility management of coffee with the aid of leguminous shrubs and trees (multi-purpose function of shade, mulch, source of nutrients and erosion control); (3) a comparison of economic returns between strictly organic coffee farming and coffee production with all standard inputs; (4) determination of fertilizer requirements of high density compact growing coffee with resistance to CBD and CLR.

4.6 Agronomy

The current spacing and pruning trials at Lyamungu with conventional, disease susceptible cultivars have demonstrated that: (1) yields per unit area increase with increasing tree density and (2) coffee trees with three stems and free growth produce

generally more than capped single or multiple (two to three) stemmed trees. These may now be concluded.

There is clearly an urgent need for plant density and pruning trials with the disease resistant hybrid clones developed by breeding. In anticipation of future releases of disease resistant compact growing cultivars, it is advisable to establish also similar trials with Catimor lines available at Lyamungu and nearby estates. These should have been selected for CLR and possibly CBD resistance. Compact coffee types require densities different from conventional tall coffee cultivars. A standard density of 1330 trees/ha is totally unsuitable for compact growing trees and beyond 7000 trees/ha the crop density becomes too high for proper farm management and crop harvesting. Compact growing coffees are generally brought up on one stem with free growth during the first cycle (three years yields) and one or two stems in the following cycles. Change of cycle is by low (40 cm) stumping. Catimors tend to produce suckers profusely and leaving a temporary 'lung branch' may not be necessary (unlikely to be present on the inner trees of high-density blocks anyway).

Plate 8. Hands on coffee research: Lyamungu Coffee Research Centre, January 2003.

Coffee yields more as a monocrop, but many smallholders intercrop with bananas for the higher economic returns, and reduced risk to livelihoods, of this cropping system. The 1999 field trial at Lyamungu on coffee interplanted with bananas, using one of the new disease resistant Arabica coffee hybrids from Lyamungu, will produce very useful data for a package of technological transfer to coffee growers. An arrangement of three rows of coffee interspersed with one row of bananas appears to offer advantages to the traditional mixed cropping system, if acceptable to small-farmers. Compact growing coffees are likely to be even better adapted to such mixed-cropping systems (e.g. as successfully applied in Costa Rica).

The following projects could be jointly implemented with the crop nutrition department: (1) soil conservation and fertility management including leguminous trees and shrubs; (2) comparing economic returns of organic and conventional coffee production (preferably with disease resistant cultivars); (3) fertilizer trials super-imposed on close-spaced Catimor and other compact growing cultivars.

Processing research should have low priority, as most of the technology for washed Arabica parchment coffee is well known from earlier in-house and external research. Rehabilitation of the existing processing facilities and (re-) training of factory staff, to be able to deal with large numbers of relatively small samples from field trials, should commence without delay.

A separate programme of agronomic trials (pruning, rejuvenation, replanting and crop husbandry) for new Robusta coffee clones in the Kagera region will have to be developed in close cooperation with the research staff at the Maruku Agricultural Research Institute.

4.7 Conclusion

The principal researchable issues and actions identified in this section have been carried forward and incorporated into the action plans (Annex 1) and log frames (Annex 2).

5 EVALUATION OF RESOURCES

In this section, the existing physical, human and financial resources at Lyamungu Coffee Research Centre, and (the proposed) Ugano, Mbimba and Maruku Coffee Research Sub-Stations, are listed and evaluated.

5.1 Physical

5.1.1 Lyamungu Coffee Research Centre

Strategically, it is important for TaCRI to be operating from well-maintained modern facilities with appropriate resources for achieving its objectives. In general, however, all the resources at Lyamungu are run down, poorly maintained or not functioning as a result of years of neglect. This section highlights the key resources that require rehabilitation, renovation or replacement. The findings are not new and have been identified previously in the Government of Tanzania's (1994) project proposal for coffee research. The same recommendations were then repeated in the PriceWaterhouseCoopers (2000) report.

Now that substantial funds for rehabilitation are available, detailed surveys on the work required for renovating the station can be commissioned. The indications provided here and the provisions made in the budget are therefore indicative figures, which require confirmation.

Plate 9. Lyamungu Coffee Research Centre Factory: September 2002.

Land Resources

There are about 168 ha of land at Lyamungu, of which about 100 ha are currently under coffee (20 ha research plots and 80 ha commercial production), with the remaining areas allocated to buildings (8 ha), catchment protection, natural forest and pasture (30 ha) and arable land (30 ha).

Dairy unit

There is currently a dairy unit at Lyamungu. This provides milk for the station and surrounding areas and also manure for fertiliser experiments. The unit runs at a loss.

Office and laboratories

These are generally in need of considerable repair and maintenance. The wiring in most of the buildings is archaic and may actually constitute a fire hazard. The buildings need to be completely rewired with sufficient sockets for modern requirements. There is a standby generator located in a laboratory.

Whilst the structure of the original buildings is sound, the newer prefabricated buildings, such as the soils laboratory, are in a bad state of repair and have been attacked by termites.

Housing

No maintenance has been carried out on the houses for at least 20 years. Considerable work is needed to bring them back to a suitable condition. A complete survey of all grades is required to prepare a schedule for repair and maintenance.

Farm infrastructure

The farm roads need to be repaired and graded. The nursery and the pulperies are very run down.

Water supply and irrigation system

The water supply for irrigation originates at Ziwani Dam, which is very silted up and requires reinforcement to the banks. The Makeresho Furrow, which delivers water from the dam to Lyamungu, also requires considerable maintenance to reduce leakage.

The irrigation dam on the station will require desilting. The irrigation equipment is very old and needs to be replaced.

Domestic water supply

The domestic water supply is sourced from a spring about 3 km away. The source has recently been protected but the delivery pipe and the reticulation system within the station need replacement.

Access road

The access road to Lyamungu has deteriorated significantly in recent years and is now very difficult to negotiate safely during wet weather. This will disadvantage the activities of the Centre and make fulfilling the objectives of TaCRI more difficult. However, it is not TaCRI's responsibility to maintain this road.

We recommend that the access road to Lyamungu CRC should be upgraded to an all-weather murram road, perhaps utilising funds from the STABEX support for rural roads.

5.1.2 Ugano Coffee Research Sub-Station

Ugano is sited 13 km from Mbinga and about two hours drive from Songea, and 1500 km (two days by road) from Lyamungu. The station is well situated within an important coffee growing area. There is a strong demand for training in the district and region, and good support from local government, NGOs and farmers.

The land at Ugano is currently owned by a co-operative society, but TaCRI is in the process of obtaining a title deed for 50 ha. The station comprises an office, two hostels

with a total capacity for 30 people, three grade 1 and three grade 2 houses. One of the grade 1 houses is currently used as a rest house. All these buildings were built in 1994 and are in need of some repairs.

Plate 10. Ugano Coffee Research Sub-Station: July 2002.

Water is piped to the station from a source about 3 km away. A large 60 kVA diesel generator provides electricity but this consumes 5 l/hour of fuel and is currently only used for five hours a day during training programmes and for a few hours on Saturday evenings.

There is no commercial coffee production on the station and only about 900 kg of parchment coffee will be produced this year from the experimental area. There is a pulpery nearby, belonging to the local co-operative, which is in need of repair so that it can be used for training purposes. At the moment, the officer-in-charge borrows equipment from other stations, or from nearby primary societies.

A key weakness of this site is the lack of communication since the nearest telephone is in Mbinga. The lack of an electricity supply means that the running costs of the station are high given the size and fuel consumption of the generator.

5.1.3 Mbimba Coffee Research Sub-Station

The Mbimba research station is located at an altitude of 1500 m in Mbozi District, Mbeya Region; this is an important, and expanding, coffee growing region with many progressive farmers. The station, which previously served as a coffee research station serving the Southern Highlands, is currently owned by the MAFS and managed as a sub-station by Uyole Agricultural Research Institute, Mbeya. It consists of 156 ha of land and about 40 buildings including offices, houses and a training centre, the latter built with EU funds in 1994, but currently leased out as a secondary school.

The station is split by the main road, which runs from Mbeya to the Zambian border. To the north of the road there are about 126 ha of land under abandoned coffee, annual crops and pasture. This area is more than is currently required by TaCRI and would be suitable for leasing out if appropriate tenants can be identified.

The remaining 30 ha of land to the south of the road includes the offices, residential accommodation and training centre. There is also a dam suitable for irrigation. The

station is served by TANESCO, and has easy access a telephone line nearby so that connection to the internet is possible.

Plate 11. Mbimba Coffee Research Sub-Station: November 2002.

We recommend that TaCRI negotiates transfer of ownership of the station from the MAFS (who have already indicated their support for this proposal). TaCRI will then take responsibility for rehabilitating and managing this station under the auspices of the TTTU. The land to the north of the road, which is surplus to requirements, should be offered for lease through the appropriate channels. Notice will need to be given to the secondary school. Mbimba Coffee Research Sub-Station will then become the centre for research, demonstration and training activities in the Mbeya Region and adjacent districts.

A survey of the work required to rehabilitate the facilities is required in order to obtain accurate cost estimates but an indicative amount has been allocated in the budget. Redundant farm equipment belonging to the Ministry will need to be removed from the station prior to TaCRI assuming ownership.

5.1.4 Maruku Coffee Research Sub-Station

Maruku Agricultural Research Institute (MARI) is situated near Bukoba town in the Kagera Region west of Lake Victoria. It undertakes research and development activities in its mandate area, namely all districts of the Kagera Region and throughout the Lake Zone where the banana / (mainly Robusta) coffee based farming systems are found. Small areas of (hard) Arabica coffee are also grown in the high altitude districts of the zone. MARI is part of the Lake Zone Agricultural Research Institute (LZARI) centred at Ukiriguru in Mwanza.

MARI's client-focused research is organised under four programmes, crops (includes coffee); livestock; socio-economics; and special programmes (including integrated soil fertility management). Staff skills include farming systems, economics, extension, as well as coffee germplasm evaluation and crop protection. In the past, MARI was a sub-station of Lyamungu Agricultural Research Institute, responsible for coffee research in the region. After the empowerment of Zones it became a sub-station of LZARI with backstopping funding from Lyamungu for coffee research (mainly Robusta). Staff at

MARI are familiar with generating and managing research and training contracts, which includes financial accountability and a reward system linked to outputs.

The station is relatively well resourced, with a conference centre and a residential training centre, recently refurbished. MARI is connected to the internet, and there is an airport nearby with regular connections to Kilimanjaro International Airport, close to Lyamungu.

We recommend that TaCRI establishes a sub-station to serve the Lake Zone to be based at Maruku ARI. As with the other sub-stations, the officer-in-charge of the sub-station would report to the Chief Executive Director, TaCRI through the Head of the Technology Transfer and Training Unit. Some research could be undertaken jointly with MARI staff.

5.2 Human

5.2.1 Lyamungu Coffee Research Centre

The TaCRI staff complement, after redeployment from the Ministry of Agriculture and Food Security and including newly recruited staff, is currently as follows:

Chief Executive Director's staff

- Chief Executive Director
- Librarian
- Secretary

Finance and Administration

- Head of Finance and Administration
- Assistant Accountant
- 2 x Office Attendant
- 2 x Typist
- Estate/Workshop Manager
- Stores Assistant
- 2 x Estate Attendant
- 2 x Workshop Attendant
- 2 x Driver
- 4 x Security Guard
- 21 x Security Guard (temporary contract)

Breeding

- Research Officer (vacant)
- 4 x Senior Field Officer
- Field Officer

Pathology

- Research Officer (acting head)
- 2 x Senior Field Officer

Agronomy

- ♣ Head of Agronomy
- ♣ 2 x Senior Field Officer
- ♣ Field Attendant

Soil and Plant Nutrition

- ♣ Head of Soil and Plant Nutrition
- ♣ 3 x Senior Field Officer

Entomology and Nematology

- ♣ Research Officer (acting head)
- ♣ Senior Field Officer

Technology Transfer and Training

- ♣ Head of TTTU
- ♣ 2 x Research Officer
- ♣ Field Attendant
- ♣ Typist

Farm Management

- ♣ Farm Manager
- ♣ 3 x Field Attendant

The level of staffing is very high for the current minimal level of activity. This gives completely the wrong impression to stakeholders, who rightly expect value for money in all TaCRI activities. Rationalisation is needed.

5.2.2 Ugano Coffee Research Sub-Station

There is currently one Research Officer based at Ugano, who is also acting Officer-in-Charge. Other temporary personnel include:

- ♣ 1 x Driver
- ♣ 2 x Security Guards
- ♣ 2 x Field Assistants
- ♣ 1 x Secretary/Office Attendant
- ♣ 1 x Store keeper/ Attendant
- ♣ 1 x Cleaner

Despite the traditional job titles, the staff at Ugano work as a team with all members contributing to tasks as appropriate. For example, the driver has been trained to assist with disease assessment and yield recording.

This is an excellent model, which allows optimum utilisation of staff and contributes to a good team spirit and a common purpose.

5.2.3 Mbimba Coffee Research Sub-Station

There are currently 10 Ministry of Agriculture staff at Mbimba including:

- 1 x Principal Agricultural Field Officer (AFO)
- 1 x Senior AFO
- 5 x Agricultural Field Assistant
- 1 x Security Guard
- 1 x Tractor Driver
- 1 x Driver

We recommend that the Ministry redeploys these staff prior to TaCRI assuming responsibility for the station. This will allow TaCRI to make its own appointments.

5.2.4 Maruku Coffee Research Sub-Station

There are currently 10 scientists based at Maruku Agricultural Research Institute with a range of skills covering farming systems research, socio-economics as well as coffee research, extension and training.

The staff operate as a multi-disciplinary team bringing the appropriate skills to bear on the range of researchable constraints that they are addressing. They are increasingly undertaking contract research with payments tied to achievement of milestones and outputs.

5.3 Financial

5.3.1 Income

By recording the sales of coffee at the weekly auction in Moshi, TaCRI is able to confirm the cess payments to be passed on to TaCRI by the TCB. The administrative advantage of the current system, from TaCRI's point of view, is that all coffee passes through the auction and cess income is therefore identifiable. Experience from the tea industry has shown that if direct sales are allowed in future, quantifying the cess due will become more difficult and may require the power to audit cess payers' production and sales records.

Government support for salaries of ex-MAFS staff will continue until June 2003.

5.3.2 Expenditure

At present, TaCRI uses manual systems for recording expenditure and income. The head of the finance and administration department developed new manual systems in readiness for the first full financial year starting from 1 October 2002.

Expenditure is recorded manually in a number of ledgers, primarily the payroll ledger, the expenditure ledger and the imprest ledger. Extracting information on expenditure on any particular cost code is therefore a time consuming task. Any delegation of budgetary control to heads of department would therefore be difficult as they are unlikely to have up-to-date information on their expenditure against budget.

5.4 Conclusion

This evaluation of resources, at the three sites, is carried forward into the strategic action plan.

6 ORGANISATIONAL STRUCTURE AND FUNCTION, STAFFING AND ACTIVITIES

Following the outcomes from the stakeholder analysis and the review of previous reports, there is broad consensus on the issues of concern currently facing the coffee industry, the actions needed to redress some of these issues, and the role that TaCRI can and should play in the future. The major uncertainty when preparing the strategic action plan is to predict future coffee production levels in Tanzania and the likely prices to be obtained on the world market. The pessimistic view is that things will not improve over the next three to five years, or could even get worse; the optimistic view is that productivity and quality of Tanzanian coffees will improve, as will world prices, and that TaCRI will contribute to this process.

In this chapter we describe: the proposed organisational structure to support the priority activities at Lyamungu Coffee Research Centre in the north, at Ugano and Mbimba Coffee Research Sub-Stations in the south, and at Maruku Coffee Research Sub-Station in the west. The function of each research department, and the staffing requirements are also specified. Detailed action plans have been prepared for each department (Annex 1). In addition, a logical framework has been developed (Annex 2), which summarises, at the levels of Institute and Department, the principal outputs and activities needed to achieve purpose (that is, the TaCRI mission statement).

6.1 Organisational structure

6.1.1 Lyamungu Coffee Research Centre

Currently, TaCRI consists of the following five research departments and one extension unit:

Breeding, Agronomy, Soils and Crop Nutrition, Pathology, Entomology and Nematology, together with the Technology Transfer and Training Unit.

It is proposed that the in future the departmental structure should be as follows:

♣ *Crop Improvement Department:*

Function: to develop, evaluate, propagate and promote high yielding, disease resistant coffee cultivars (Arabica and Robusta) with good bean size and cup quality.

♣ *Crop Productivity and Primary Processing Department:*

Function: to support the national coffee rehabilitation and replanting programme through effective research on crop husbandry practices and integrated pest management for the new coffee cultivars grown in contrasting farming systems; to provide information and to undertake research as necessary on primary processing technologies; to collate meteorological data.

♣ *Crop Nutrition Department*:

Function: to develop, evaluate and promote cost effective and appropriate integrated soil fertility management systems (inorganic and organic), with a focus on the new cultivars; to provide a high quality and reliable commercial analytical service to coffee farmers and supporting agencies.

♣ *Livelihoods and Income Security Department:*

Function: to describe and understand the diverse farming and livelihood systems in the coffee growing areas of Tanzania, to identify and prioritise the constraints to productivity and profitability and to propose, evaluate and promote possible solutions.

♣ *Technology Transfer and Training Unit:*

Function: to support the rejuvenation of the coffee industry by promoting and disseminating appropriate and financially viable, proven technologies to farmers and associated agencies; to facilitate an effective two-way linkage between researchers, district extension staff and farmers by encouraging, for example, the use of participatory research techniques; to support the development of nurseries producing new cultivars for the replanting programme; to develop and deliver training courses (training the trainers); to promote market awareness, including an appreciation of cup quality.

6.1.2 Ugano Coffee Research Sub-Station

Function: to support the development of the coffee industry in Ruvuma Region, especially Mbinga and neighbouring districts, by disseminating proven technologies to district extension staff, farmers and estates through the provision of training courses and by promoting extension messages; and, to support the central research programme by facilitating on-farm and on-station research. The officer-in-charge will report to the head of the Technology Transfer and Training Unit.

6.1.3 Mbimba Coffee Research Sub-Station

Function: to support the development of the coffee industry in Mbeya Region, particularly Mbozi and neighbouring districts, by disseminating proven technologies to district extension staff, farmers and estates through the provision of training courses and by promoting extension messages; and, to support the central research programme by facilitating on-farm and on-station research. The officer-in-charge will report to the head of the Technology Transfer and Training Unit.

6.1.4 Maruku Coffee Research Sub-Station

There is concern about the continued viability of Robusta coffee production in the Lake Zone due to the low prices, and the threat imposed by coffee wilt disease (*Fusarium xylarioides*), low inherent soil fertility, farmer demoralisation, unsupportive policy environment (leading to large quantities of coffee crossing the border to Uganda). However, Robusta coffee production remains an important source of income, contributing to the livelihoods of a large number of people in the region. It also contributes to cess income and TaCRI is committed to supporting the development of this important component of the Tanzanian coffee industry.

Function: to support the development of the Robusta coffee industry in Kagera Region, by disseminating proven technologies to district extension staff, farmers and estates through the provision of training courses and by promoting extension messages; and, to support the central research programme by facilitating on-farm and on-station research. The officer-in-charge, to be based at Maruku Agricultural Research Institute, will report to the head of the Technology Transfer and Training Unit.

Note 1: previous reports provide a guide to the priority issues of concern to stakeholders in the region, but these need to be revisited as a result of the stakeholder analysis and recommendations made in this report. However, selecting for resistance to coffee wilt disease, amongst the erect Robusta types originally identified in Uganda, is a priority.

Note 2: a memorandum of understanding between MAFS and TaCRI needs to be prepared covering the shared use of facilities, and opportunities for collaborative work.

Note 3: since the EU originally funded the construction of the training centre, for training coffee farmers, the memorandum of understanding should include provision for the transfer of ownership to TaCRI.

6.1.5 *Central Administration*

To support the Chief Executive Director the following teams are recommended:

♣ *Accounts and Personnel Team*

Function: to support the activities of the research departments by efficiently managing TaCRI's financial and personnel activities; to facilitate the effective decision making by TaCRI senior staff by using the Management Information System to produce appropriate and timely information.

♣ *Site Management Team*

Function: to support the efficient operation of Lyamungu Coffee Research Centre by managing all estate and farm activities including building and site maintenance, research logistical support, bulk coffee production and coordination of the vehicle pool.

6.2 Staffing

The staffing required to implement the strategic action plan is summarised below, together with brief job descriptions of the senior posts. The underlying assumption is that TaCRI should begin with the minimum number of staff required to establish the work programme. Once this is underway, it will be the responsibility of heads of department to make a case for an increase in staff based on the achievements to date, and the expected expansion in activities. Similarly, should some staff be surplus to requirements, or the skills required change, then it is the responsibility of heads of department to alert the chief executive director to this fact. It gives entirely the wrong impression to stakeholders (and others) to see people not actively and gainfully employed. It also demoralises those people who are working hard. Job demarcation, linked to perceived status, must be minimised.

Everyone, regardless of position, must be prepared to undertake many tasks depending on the need at the time. For some, this will be a major cultural change. Multi-disciplinary approaches to research are to be actively encouraged.

6.2.1 Chief Executive Director

This is an extremely important and challenging post. Multiple skills are needed. The primary function is to create a viable research institute in which stakeholders, including Government and donors, have confidence. The creation of TaCRI comes at a particularly difficult time given the current state of the coffee industry. Looked at positively, it also comes at a time when TaCRI has an opportunity to play a major role in the rejuvenation of the industry. Certainly this is what stakeholders expect. To achieve these objectives the chief executive needs to face outwards, by liasing closely with stakeholders and influencing policy makers, as well as inwards, by ensuring that responsive and viable research and technology transfer programmes are undertaken and reported to the highest standard. All this has to be achieved within a framework of effective financial and resource management. Combining all these tasks will not be easy. The CED will require a strong management team with delegated responsibilities for (a) external relations, (b) research management and (c) financial and resource

management. The CED could take personal responsibility for one or more of these activities, but he is, of course, ultimately responsible to the Board of Directors for all them. Research Departments

6.2.2 Research Departments

Heads of research departments: a great deal of responsibility rests with these post holders. It is fundamental to the future success of TaCRI that forward thinking, dynamic leaders of research, with proven records of achievement are appointed to these positions. Experience with coffee is not necessarily a pre-requisite. Heads of departments need to face outwards (to the industry) as well as inward (to the research programmes). This combination of skills is not always easy to find in one individual. The position of head of department should be treated as an 'additional post' reviewed every three years, and renewable subject to satisfactory performance judged against objective criteria (log-frame outputs).

Plate 12. New coffee planted under bananas: July 2002.

Crop Improvement Department: since the development and release of new cultivars is critical to the future of the coffee industry in Tanzania, it is imperative that the right person is appointed as head of this department as soon as possible, with clear terms of reference. S/he must be familiar with up-to-date breeding and plant propagation technologies, but it may be difficult to identify someone with experience in coffee breeding (desirable). *We recommend* that an external adviser from the region is identified who would work closely with the head of this department to develop an effective breeding programme as quickly as possible (further details of this post, and the research programme, are given in Annex 1). Regional and international links will need to be established to facilitate access to modern facilities. As selecting for disease resistance is central to the research programme, *we recommend* that the plant pathologist becomes a member of this department, supporting the work of the plant breeder by screening for disease resistance, but undertaking tasks on behalf of other departments as needed. In addition, there should be three field officers.

Crop Productivity and Primary Processing Department: the challenge for the head of this department will be to look forward and to be imaginative in terms of the research undertaken, and to manage a diverse portfolio of subjects. *We recommend* that the head of department (an agronomist) is supported by an integrated pest management specialist (a new post). New thinking will be required. Again, it is probably worth identifying someone from the region who can work closely with staff in this department, in an advisory capacity, to establish a demand-driven research programme building on experience obtained elsewhere. In addition, there should be three field officers. The head of this department should also be responsible for collating, checking for accuracy, interpreting and reporting (in the TaCRI annual reports) monthly weather data for each of the principal coffee growing areas in the country (TaCRI sub-stations), and for managing the Lyamungu weather station, if agreement can be reached with the Tanzania Meteorological Agency.

Crop Nutrition Department: there are two major activities for the head of department to manage: (1) to develop a field based, including on-farm trials, research programme, and (2) to create a functioning, and reliable, analytical service. Both activities will require careful planning and management. *We recommend* that a laboratory manager is appointed to take day to day responsibility for the procurement of equipment, for the rehabilitation of the laboratory, for routine analysis of samples (research and commercial), and for quality control (including external validation of results). A service contract will be needed to maintain the analytical equipment in working order. In addition, there should be four field officers attached to this department (two field; two laboratory). This level of staffing may need to increase once the laboratory is fully functional.

Livelihoods and Income Security Department: as this is a new initiative, *we recommend* that initially two research officer appointments are made on three year contracts, renewable if the need is justified. One of these should be an economist and the other a rural sociologist, one of whom may, if appropriate, be nominated as head. No additional support staff will be required. Close links with the Technology Transfer and Training Unit (and other departments, to ensure that there are exchanges of experiences with the technical subject matter specialist) should be encouraged and resources shared when appropriate.

Technology Transfer and Training Unit: there are several functions for the head of this important unit to manage: (1) developing extension packages, (2) developing and promoting an extension service (with the district councils), (3) developing farmer managed nurseries, and (4) delivering training. At Lyamungu, *we recommend* that, in addition to the head of unit, there is one research officer (a trainer), an audio-visual and publication specialist, a nursery coordinator, and an extension agronomist. In addition, the head of the TTTU will be responsible for Ugano, Mbimba and Maruku Coffee Research Sub-Stations. Each of these will have extension agronomists/trainer as the officer-in-charge supported by two field officers.

6.2.3 Central Administration

To support the Chief Executive Director (CED) in the administrative management of TaCRI, *we recommend* that two small teams, responsible for Finance and Personnel, and for Site Management, are created.

Accounts and Personnel Team: this is currently a large and diverse department and, with a few exceptions, the existing staff do not have the skills necessary to support TaCRI's new role as an efficient, forward looking organisation. This team must

facilitate the smooth running of the research departments rather than attempting to control activities. The level of staffing needs to be reviewed with the aim of reducing numbers. The exception is in finance, where there is an urgent need (highlighted above) to employ a highly computer literate accountant (a new post) to introduce the MIS. It would be extremely advantageous if the accountant is also familiar with EU procedures and protocol, in order to ensure the smooth management of the STABEX funds.

Increasingly, members of research staff will be responsible for their own secretarial support and the traditional role for typists will disappear. Those typists with good IT skills could therefore be redeployed to help with, for example, data entry into the MIS.

The librarian may have a greater role in future when funds become available to purchase books and journals, but this is not a full time position and could be combined with another function such as personnel. Alternatively, a suitably skilled person could play an important role in preparing and distributing TaCRI publications, and in maintaining the web site. Inevitably the actual role would depend on the capabilities of the person in post.

The need for office attendants must be evaluated carefully (in the modern age, messengers are a luxury) as must the future role of the workshop and estate attendants. For example, commercial companies could be responsible for vehicle and building maintenance.

We recommend that, in the light of the reorganisation of these functions, the post of head of the (existing) finance and personnel department is no longer necessary, and that the (new) accountant reports directly to the CED.

Site Management Team: since the intention is to lease out as much of the commercial coffee area as possible, and the dairy project will be discontinued, the traditional role of the farm management department will decline. *We recommend* that a site manager (preferably with a BSc and several years of appropriate experience) is employed to take on the responsibilities for both farm and estate activities. The new team will encompass selected personnel from the (existing) farm management and estate management departments. The site manager should report to the CED and take on responsibility for supervising the rehabilitation of Lyamungu. S/he should be assisted by a new post of clerk of works, employed on contract for the duration of the rehabilitation process. The site management team should take on responsibilities for servicing the field trials and the mass multiplication plots as these come on stream. In addition, they should take responsibility for the irrigation system operation and maintenance, and for the small coffee factory.

6.2.4 Communication Strategy

TaCRI must raise awareness amongst its principal stakeholders, opinion formers (including the press), and government at all levels of its activities and successes. This needs to be planned strategically, the target groups identified and the most appropriate communication activities and products specified. *We recommend* that TaCRI employs a communication/marketing specialist (on a short term basis) to develop a communication strategy appropriate to its short and long term requirements. In view of the need for TaCRI to counter recent adverse publicity, the need is urgent. As an immediate action, the first annual report, highlighting what has been achieved since September 2001, needs to be written, published and distributed (by 1 July 2003): see annex 1 for implementation schedule.

7 CAPACITY BUILDING

In this section the actions needed to renovate and develop the infrastructure and equipment at Lyamungu Coffee Research Centre, and Ugano, Mbimba and Maruku Coffee Research Sub-Stations, are outlined, including the provision of transport. The need for continuing staff development is also reviewed, and new appointments summarised. Within the time frame allowed for this strategic review, it was not possible to obtain detailed costings for refurbishment. Lump sum provisions have therefore been made in the budget, which should be confirmed by detailed surveys.

7.1 Infrastructure and equipment

7.1.1 Lyamungu Coffee Research Centre

Land resources: the PriceWaterhouseCoopers (2000) report examined three options for the commercial coffee production areas. The choice is between continuing with commercial production managed by TaCRI, or to lease the land to others. The main attraction of continuing with the present system is, in the opinion of some, that TaCRI would be able to test recommendations for estates at a field scale and also to demonstrate a model estate production system. In our view, this argument is flawed in three ways:

- Firstly, in order to be an outward facing organisation, TaCRI must engage fully with their stakeholders including the estate sector. To do this it is better to undertake collaborative research on estates. For example, the neighbouring APK estate would be an ideal site for field scale trials of new technologies where the results can be jointly evaluated by the estate manager and the researcher. This approach is far more likely to lead to technology uptake than if the research is carried out at Lyamungu.
- Secondly, running a model estate would detract from TaCRI's core business, which is to produce and disseminate appropriate technologies for the Tanzanian coffee industry. The management's role in achieving these objectives is difficult enough without diverting attention and increasing the staff complement to run the estate.
- Finally, the small area of land available would not bring economies of scale and therefore the cost of production would be higher (and profits lower) than on a larger estate enterprise.

We recommend therefore that the production areas should be leased to commercial organisations. However, at present substantial areas are intermingled with the research plots and are therefore unlikely to be attractive to potential leasers (Fig. 2).

The two largest areas suitable for leasing are Usagara (40 ha), and fields 28 and 29 (13.4 ha). There has already been an offer from the neighbouring estate to lease Usagara. By including the adjacent grass collection areas (4 ha), which will no longer be required when the dairy herd is sold (see below), this could be increased to 44 ha.

By parcelling Fields 28 and 29 with Fields 43, 44, 45 and 46 (excluding the 1.8 ha of research plots) a contiguous area of about 35 ha becomes available, making the total area 79 ha. The large pulpery and the nearby house could be included with this plot, which would then form an independent unit. This is likely to be attractive to potential commercial growers. A further enhancement would be to offer to sell improved disease resistant material to whoever leases the land for them to plant the land that is currently

grass. This would give a large area of these varieties situated within the research station boundaries and under commercial evaluation.

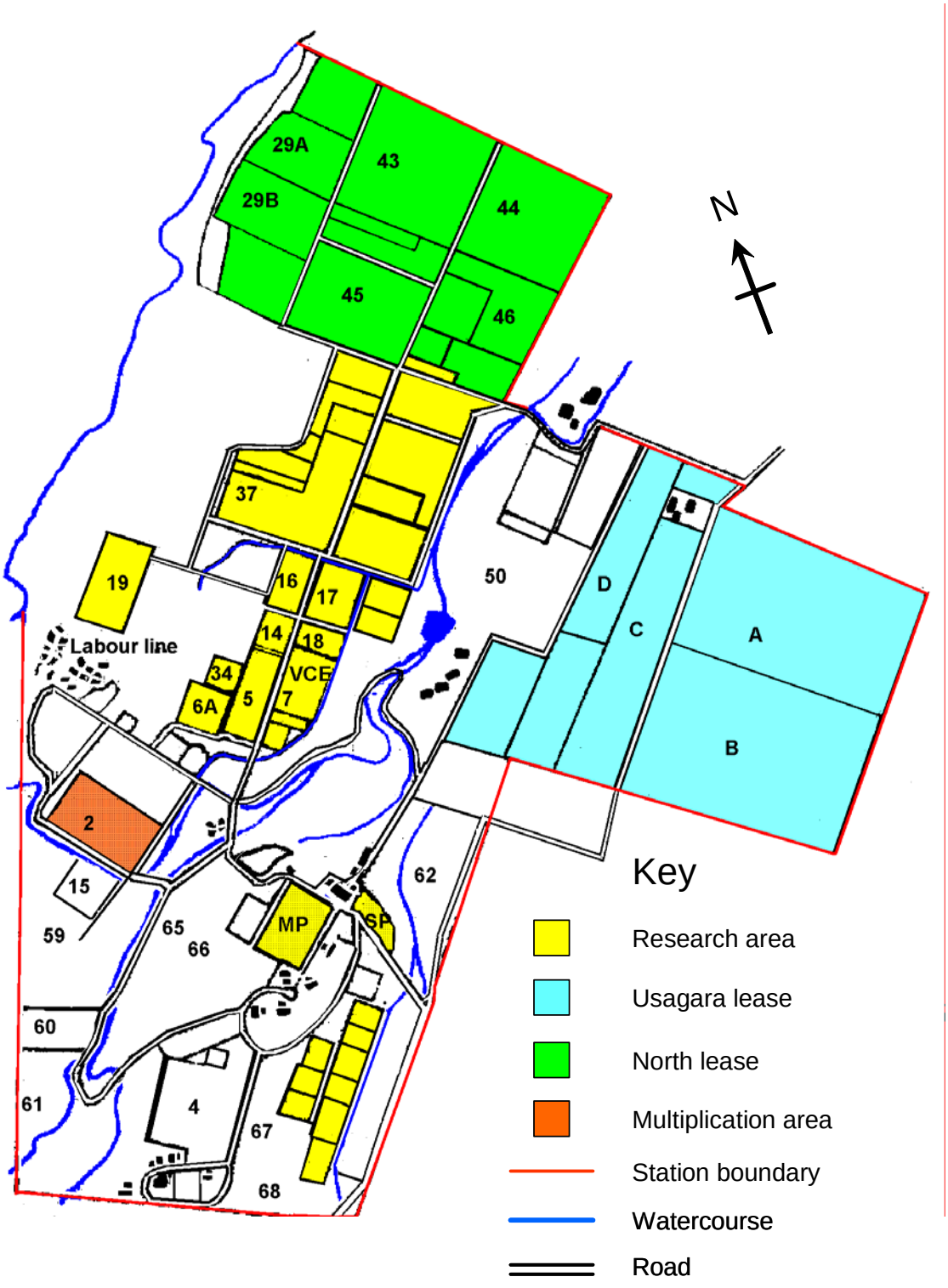


Figure 2. Plan of Lyamungu Coffee Research Centre showing main coffee areas.

The remaining commercial areas within the research fields would continue to be managed by TaCRI and be available for experiments as required. This means that the total area of coffee remaining for research at Lyamungu CRC would be about 47 ha.

The 30 ha of conservation land within the station boundaries is being encroached by the surrounding villages and needs to be protected to prevent land degradation and to ensure the integrity of the catchments.

To reduce the current tension between TaCRI and neighbouring villagers, *we recommend* that the TaCRI Board provide strong support to the CED to establish the true boundaries of Lyamungu (for example by fencing), to maintain the conservation areas in their proper state, and to limit the number of unofficial footpaths crossing the station. Staff should also be instructed not to use TaCRI land for agricultural activities.

Dairy Project

- *We recommend* that the dairy project is closed immediately and that the cattle are sold. Any requirements for manure for fertiliser trials can be sourced from the surrounding villages.

Office and Laboratories

- *We recommend* that a full survey of the offices and laboratories and the fixtures and fittings is carried out to determine the full extent of renovation work required to bring them up to the standard required for a modern research station. An engineer needs to be contracted to develop the specification for the renovation work, which should then begin as soon as possible. The engineer could also provide a supervisory service during construction.
- *We recommend* that a learning centre is built, incorporating the library with internet access and a small conference centre with break-out rooms.
- *We recommend* that a new building is constructed to house the crop productivity and primary processing, and crop nutrition departments (including the analytical laboratory).
- *We recommend* that a programme for replacing essential laboratory equipment commences as soon as funds are available. Provision has been made in the budget for this, based on equipment lists provided by heads of departments.
- *We recommend* that the meteorological station is rehabilitated immediately, and responsibility for management and data collection transferred to the head of the crop productivity and primary processing department.

Housing

- *We recommend* a complete survey of all grades of house to prepare a schedule for repair and maintenance. Renovation work should then be phased over two years with priority based on the results of the survey.

Farm Infrastructure

- *We recommend* that the farm roads should be repaired and graded as soon as possible.
- *We recommend* that the nursery and the small pulpery are both renovated. The factory can then be used to process coffee from the research areas on Lyamungu, providing an additional income stream.

Water Supply and Irrigation System

- *We recommend* that the Ziwani Dam is desilted and the embankments are reinforced. The Makeresho Furrow delivering water from the dam to the Lyamungu CRC should be rehabilitated to reduce leakage.

- ♣ *We recommend* that any negotiations to lease out land on Lyamungu Coffee Research Centre should pay due regard to ensuring that the station has a sustainable water supply for irrigating the remaining area and for any further expansion that may occur.
- ♣ *We recommend* that the irrigation dam on the station is desilted, and that a permanent pump station is constructed to house an electric irrigation pump.
- ♣ *We recommend* that new irrigation equipment is purchased, including a buried main along the main road through the experimental area. This will reduce the need for portable mains to be carried around and will decrease the turnaround time when irrigating the coffee.

Domestic Water Supply

- ♣ *We recommend* that the main domestic water supply delivery pipe and the reticulation system within the station are surveyed with a view to overhaul and replacement as necessary.

7.1.2 Ugano Sub-Station

- ♣ *We recommend* that the buildings at Ugano are renovated (including appropriate furnishings in the Training Centre).
- ♣ *We recommend* that the large generator is supplemented with a smaller 15 kVA model that will have a much better fuel economy and will be suitable for the current size and function of the station.
- ♣ *We recommend* that consideration is given to taking over the adjacent pulpery to serve the sub-station, and for training purposes.
- ♣ *We recommend* that the station is connected to the telephone system in Mbinga to allow email and telephone communications.
- ♣ *We recommend* that the meteorological station in Mbinga is re-located to Ugano and upgraded.

7.1.3 Mbimba Sub-Station

- ♣ *We recommend* that, subject to need, the buildings at Mbimba are renovated and a structural survey undertaken to specify the required works.
- ♣ *We recommend* that the 126 ha to the north of the main road is leased out for commercial coffee production. The payment rates should be similar to those achieved for the Lyamungu land.
- ♣ *We recommend* that the meteorological station is upgraded to national standards.

7.1.4 Maruku Sub-Station

- ♣ *We recommend* that the buildings to be used by TaCRI at Maruku are renovated to a suitable standard subject to a structural survey to specify the required works.
- ♣ *We recommend* that the condition of the meteorological station is reviewed, and agreement reached with MARI on any renovation needed.

7.1.5 Vehicles

It is always difficult to predict the precise number of vehicles required by an organisation, which is currently carrying out little useful work, due to funding constraints. The temptation is to over provide and this tends to lead to over-expenditure on travel.

We recommend that TaCRI operates a pool system to optimise the use of vehicles, and to prevent transport from being too closely tied to individual departments. To operate successfully, these requirements would need to be discussed at weekly planning meetings by department heads to confirm to their weekly work plans. Wherever possible, joint trips should be planned to ensure efficient use of transport and to foster a co-operative team spirit between departments.

The number of vehicles required will be related to the expected usage, and therefore to annual work-plans. It is envisaged that some departments, such as the TTTU, may have more regular need for a vehicle because of the amount of travelling required in order to meet the targets. In this case, the vehicle could be booked for a longer duration, with the proviso that it is available for short trips by other staff if it is not being used. We also recognise that, in the future, vehicles may be purchased on externally funded projects. In these cases priority should be given to the project but the vehicle will not be tied to an individual and should remain in the pool.

Since TaCRI is located some distance from Moshi, there is pressure from staff to use TaCRI vehicles for personal matters in town. Although a few senior staff have their own vehicles many are unable afford one at present. It may be possible for TaCRI to facilitate staff members to obtain loans from banks. If this is possible, the use of TaCRI vehicles for personal business could then be discouraged and charged at the standard rate prevailing at the time. This system would help distinguish more clearly between official and personal use of vehicles.

7.2 Human resource development

TaCRI depends for its success on having a highly competent, well motivated staff who are able to respond to the challenges posed by the change from a moribund Government organisation to a well resourced, client-focused research institute. The shift in attitude required is already being addressed through team building and other training programmes. Ultimately, however, personal development will only be successful if the individual is ready to change.

The new responsibilities assigned and results expected from staff bring considerable pressure to perform – pressure that has been absent for the last 20 years. It is therefore vital for the TaCRI Board of Directors to support the CED in his decisions on who will or will not be able to respond to the challenges ahead. TaCRI cannot afford to carry any passengers.

Performance Appraisal System

To ensure that the process of determining whether or not individual members of staff are able to perform to the high standard expected, *we recommend* that a performance-based annual appraisal system is introduced to support TaCRI's human resource strategy.

A transparent, fair and effective method of monitoring and appraising performance is required in order to help individual staff achieve their potential. A target-based approach to appraisal is effective if specific, measurable, realistic and time-bound targets are identified and agreed by the line manager and the member of staff on an annual basis. This is particularly important for senior staff with responsibilities for the development of annual workplans for their departments. Their targets would naturally be tied to achieving the agreed work-plan on time and within budget. A quarterly review of progress will then help to identify any constraints and agree plans to overcome them. For more junior staff, targets would concern delivery of specific outcomes related to

their job description – hence a field officer may have targets related to the efficient and effective management of experiments, and the timely and accurate collection and collation of data.

This system cannot be effectively implemented through a strategic report such as this. A detailed training needs assessment is required, together with participative appraisal training, to ensure that the process is clearly understood and is operated effectively to gain maximum benefit for TaCRI and the individuals concerned.

We recommend that consultants are contracted to assist TaCRI in developing an appropriate performance-based appraisal, and to train staff in operating the system effectively.

We recommend that for senior staff, a performance related bonus is paid, subject to individuals achieving the annual targets agreed during the appraisal system.

The appraisal system will also allow areas for personal and professional development to be identified and personal targets to be set related to individual development requirements. This process will result in each individual developing a personal development portfolio documenting the actions they have taken to improve their knowledge and skills.

Continuing professional development can take a number of forms, including visits to other research organisations in the region and beyond, attendance at conferences and participation on internal and external short courses. Individual training needs should be identified during the annual appraisal so that the costs can be budgeted.

There will be considerable demand from members of staff to enrol on postgraduate training courses. Whilst this desire is understandable and supports TaCRI's requirement to develop subject matter specialists, it is very time consuming and could detract from the main objective of getting TaCRI operational as soon as possible.

We recommend therefore a two-year moratorium on postgraduate training (MSc and PhD) whilst TaCRI implements the strategic action plan. This will give time for the priority cases for postgraduate training to be identified through the annual appraisal system.

In the future, when PhD training is justified, *we recommend* that it is undertaken on a split time/location basis, with two years field/laboratory research undertaken at TaCRI alongside other duties, and no more than two years spent at the university concerned (at the start of the project and afterwards when writing the thesis). For MSc courses a similar, but shorter, split is appropriate.

The case for supporting undergraduate training is even more difficult to justify as the member of staff would then be unavailable to TaCRI for four years. The only way in which this level of training could be undertaken without seriously jeopardising the TaCRI outputs would be to employ more staff to cover during their absence, but this would have substantial budgetary implications. As a privatised research organisation, TaCRI cannot afford to be a route to higher education unless it is impossible to recruit staff who already have the required level of knowledge, skills and abilities.

We recommend that TaCRI does not sponsor any undergraduate training, except in exceptional circumstances where this type of training is essential to achieving TaCRI's objectives.

Information Technology Training

There will be a continuing need for various forms of IT training for TaCRI staff. For example, the general level of information technology (IT) skills is currently low. A few senior researchers have reasonable skills in the key Microsoft Office components (Word, Excel and PowerPoint) and some competence in statistical software such as M-Stat, SPSS and Genstat. Two secretarial staff have been on a three-month training course on Word and Excel. Once the computers have been installed at Lyamungu (see Chapter 8.1), a general training programme will be needed to ensure that all staff understand the basic importance of good file management and can use Word and Excel.

Meteorological Recorders Training

Training will need to be provided to the field officers charged with the important task of recording weather data on a daily basis at each station. This can either be provided by the Tanzania Meteorological Agency or for example by an arrangement with the Tea Research Institute of Tanzania, which has well trained met-recorders.

7.3 New staff appointments

Key to the success of any organisation is to appoint the right people at the beginning. A substantial number of new senior staff (graduate level and above) have been identified and appointments are due to be made over the next year (budgeted from 1 July 2003). These include:

Accountant

Site manager

Clerk of works

Plant breeder

Integrated pest management specialist

Analytical laboratory manager

Economist

Rural sociologist

Communication specialist

Nursery coordinator

Extension agronomist/trainer x 3

This is a total of 13 new appointments. In addition the field officer posts will need to be reviewed in the light of this report.

Clear job descriptions will need to be developed, the posts well advertised (within Tanzania and beyond), interview panels appointed, references obtained, and only candidates of the right calibre, and with the ability and enthusiasm to contribute effectively to the work of TaCRI, appointed. These appointments will then need to be systematically monitored during the probationary period, and the positions confirmed only if the individuals have demonstrated their potential to serve the industry effectively.

We recommend that, as soon as the Strategic Action Plan has been accepted and funding confirmed, the new staff appointment process begins.

8 INFORMATION TECHNOLOGY AND MANAGEMENT INFORMATION SYSTEMS

This section outlines a pragmatic strategy to strengthen the information technology (IT) and management information systems (MIS) capabilities within TaCRI. The general approach should be to plan for continuous improvement through a steady development of facilities, as the need arises, and by increasing the ability of the staff through informal and formal training.

8.1 Information technology

8.1.1 Training and Human Resources

The key issue for TaCRI staff is to develop their own competence in IT. This has to take place at three levels:

- Firstly formal training to introduce individuals to the basic principles of computing and, in particular, file management and data security alongside the key aspects of word processing and spreadsheets.
- Secondly, internal support mechanisms, primarily using the more competent staff as a resource, will allow individuals to develop their skills on a continuing basis.
- Thirdly, supplementary training programmes on specific software packages together with access to internet support sites, where specific questions can be posted and replies promptly received.

Whilst it is imperative that senior staff performing financial, research and management roles are very competent in IT skills, it is also important for secretarial and technical grades to be equally capable. Two secretarial staff have already received training, but technical staff should also be trained in Word and Excel so that they can enter data, undertake basic analysis and present reports.

This programme of personal development needs to proceed in parallel with the software and hardware development programme.

8.1.2 Software

We recommend that general software installed on every computer includes the MS Office suite together with utilities such as WinZip (to compact files), and virus protection software such as Norton Utilities. The virus protection software needs to be updated via the internet on at least a weekly basis to protect against new and potentially very damaging viruses.

Specialised software required include statistical packages such as M-STATC, SPSS and GENSTAT, web authoring software (e.g. MS FrontPage) and possibly project planning software such as MS Project.

For financial purposes, the baseline should be to use Excel to record income and expenditure, payroll details, vehicle records and an asset register. The implementation of a second phase using individual packages for accounting, payroll, and asset management should be resisted at present as it will immediately reduce the number of people who are familiar with, and can therefore use, the software.

Table 1. Recommended priority and distribution of software

Priority	Distribution		
	All	Restricted few	Selected individual
Immediately	MS Office Norton Antivirus	Bibliographic Statistics	Web authoring Publishing
Medium term	Network	Project management Database	Accounts Payroll Asset management

TaCRI will need to develop a software upgrade policy. *We recommend* an annual review of the software installed on all machines to ensure that there is compatibility. The policy should be to obtain the most up-to-date software available when new machines are purchased.

8.1.3 Hardware

Computers: suitable hardware is readily available in Tanzania at prices not dissimilar to elsewhere in the world. However, when obtaining quotations, clear specifications are required to ensure that the most appropriate equipment is purchased. The most urgent priority is to provide senior members of staff with a desktop computer with Uninterruptible Power Supplies (UPS) to prevent data loss and damage to the computers from power surges. The Technology Transfer and Training Unit and Livelihoods and Income Security Departments will need notebook computers.

We recommend that the minimum specification should be as follows:

- 1 GHz processor
- 256 MB RAM
- 10 GB hard disk
- CD-Read/Write

The Read/Write CD enables full back ups to be made far more easily than with floppy disks and are now cheap enough to be considered as standard equipment on all PCs.

All users should back up their work on at least a daily basis, and the back up should be stored in a safe place separate from the computer. Vital accounts and research results data should be stored in a fireproof safe in a secure building.

Table 2 provides a breakdown of the existing computer resources and the *recommended* immediate additional requirements for TaCRI.

Table 2. Recommended immediate computer requirements for TaCRI.

Department	Computer		Printer		
	Desktop	Notebook	Inkjet	Laserjet	Central
CED	3	1	1		
Accounts	3		1	1	1
Crop Improvement	2		1		
Crop productivity & PP	2		1		
Crop Nutrition	1	1	1		
Livelihoods & Income Security		2	1		
TTTU (Maruku)		1		1	
TTTU (Mbimba)		1		1	
TTTU (Ugano)		1	1		
TTTU	1	2	3	1	
Total	12	9	10	4	1
Existing	2	2	2	2	0
Required	10	7	8	2	1

A replacement policy for computers is required. A four-year cycle is adequate for desktop PCs but notebooks tend to be more fragile and should be replaced every three years. *We recommend* a trickle down approach where priority for new computers is given to those with the highest power requirement (i.e. maths or graphics intensive applications), not by seniority. Old computers can be passed on to other users with less intensive needs. Buildings with computers installed will need to be made secure to avoid theft.

Networking: as the number of computers grows and the requirement to share information increases there may be a need to establish a local area network (LAN) at Lyamungu. This would permit central storage of data on a server, use of central printing facilities, and access to email and the internet from all the computers on the network. Wireless networking technology is becoming sufficiently advanced to network all the main office buildings. However, the level of computer usage is not yet sufficient to justify this step, which would require an additional post of a computer technician to service the network. *We recommend* therefore that the requirement for a network is reviewed after two years to determine whether centralised storage, printing and internet access is required.

Printing: these facilities need to be enhanced and a laser printer capable of double sided printing would reduce paper costs and enable professional reports to be produced. At least one inkjet printer is needed in the principal departmental buildings at Lyamungu. In addition, an inkjet printer capable of A3 printing would be useful for small posters. See also our recommendations on audio-visual printing below.

Internet: access is possible via the microwave telephone system recently installed at Lyamungu and Maruku. At Lyamungu, there is capacity for 50 telephone lines of which 15 are currently in use. One or two lines could be dedicated to internet access but care should be taken as access costs can rapidly escalate if free use of the internet is possible.

We recommend that a priority study should be carried out to determine the cost of connecting Ugano Coffee Research Sub-Station to the Mbinga telephone system to improve communications with the research centre at Lyamungu and sub-stations elsewhere.

Access is currently achieved with 56K modems but faster access with digital links may be possible in the future. This capability will be constrained by the telephone system data capacity.

8.1.4 Information Provision

Web site: the remarkable spread of the internet now means that access is possible in most towns in Tanzania. Computers are becoming increasingly common and the internet provides an ever more useful way of disseminating information to stakeholder organisations.

We recommend that a good web site becomes a key component of TaCRI's strategy to raise its profile and to maximise the availability of information to stakeholders. A web site could provide information about TaCRI, downloadable reports and research results, extension leaflets, a news section covering key aspects of the world coffee market and articles of interest about coffee.

Web design is very important if the site is to be accessible and *we recommend* that TaCRI obtain the services of a good web design company to produce the site. This can be hosted on the ISP provider's site in Moshi rather than requiring a dedicated server at TaCRI.

Once the site has been developed it needs to be kept up to date. This does not require a great deal of time but an interested person, with some web authoring skills, is essential. The web design company would no doubt be happy to enter into a maintenance contract for monthly updates with information provided by TaCRI. At a later date, a member of TaCRI staff could be asked to take responsibility for maintaining the web site.

Online journals and the library: the use of IT to access information from the internet means that it is an essential resource for TaCRI. In particular, access to online journals will allow researchers to keep up to date with developments in science and technology transfer.

TaCRI has joined the PERI system, which gives free access to a wide range of online journals available internationally. The number of journals available continues to grow, and this source should form the principal resource for literature searches.

The availability of online journals does not completely obviate the need for general or topic specific books and subject reviews. The library is in urgent need of being updated to provide current information. *We recommend* that funds should be allocated for a range of relevant books to be purchased with a recurrent budget to allow the library to develop over time. Space will have to be made by archiving or removing outdated material.

Audiovisual equipment: one of the primary functions of the TTTU is to disseminate information to stakeholders. Visual messages are very effective in this regard, as can be seen from the excellent videos on coffee production produced by the CMU. In order to be able to provide a continuing stream of video and paper based materials, including leaflets and posters, an audiovisual and communication section should be established under the line management of the head of the TTTU.

We discussed the option of an audiovisual vehicle to provide projection facilities but this currently costs about TSh 60 million. There are now much cheaper and more flexible options following the development of high performance PowerPoint video projectors.

We recommend that sufficient equipment is purchased to equip an audio visual unit at Lyamungu, and for projection equipment at Ugano and Mbimba. It is assumed that these facilities are already at Maruku and will be available for use by TaCRI. The equipment required is as follows:

- 3 x PowerPoint projectors to be located at Lyamungu, Ugano and Mbimba. These will need portable screens, VCR players and notebook computers with DVD drives and a small portable generator for use in areas without power.
- 1 x digital video camera
- 1 x video editing computer with the following specification:
  - Pentium 4 2.6 GHz processor
  - 1 GB RAM
  - 120 GB Hard disk
  - 21" monitor
  - DVD writer
  - Firewire high speed data connection for downloading digital video
  - Adobe video editing software
- 3 x digital camera with at least 3 x optical zoom and 128 MB memory cards (minimum resolution 2 megapixels)
- 1 x A0 colour inkjet poster printer
- 1 x A0 laminating machine

8.1.5 Summary of Recommendations

1. Purchase desktop computers for all senior staff members (except TTTU and livelihoods and income security department who need notebooks) with minimum specification as recommended above.
2. Purchase six further desktop and two notebook computers for deployment as recommended above.
3. Identify IT training needs and implement staged training.
4. Install MS Office and an Anti-Virus program on every machine.
5. Purchase M-STATC, SPSS and/or Genstat for installation on a limited number of computers (i.e. restricted to those who will be using the software).
6. Review software provision annually to ensure compatibility.
7. Implement a trickle down approach to ensure that the most powerful computers are allocated to those who need them most.
8. Review the requirement for wireless networking in two years.
9. Investigate possibility of connecting Ugano Sub-station to the telephone to allow email contact.
10. Work with a web-design company to develop a TaCRI web site as a key information dissemination pathway.
11. Allocate funds for updating the printed library resources to supplement the online journal provision.
12. Purchase audiovisual equipment for an audiovisual unit at Lyamungu and three portable projection units.

8.2 Management information systems

There is often the perception that installing a management information system (MIS) will provide the solution to all management information requirements. However, this action is normally the beginning of a long and difficult process, which is not guaranteed to succeed. Earl (1999) identified the challenges for an MIS strategy as being:

- "Confronts the *future* – which senior executives find uncomfortable;
- Centres on *information* – which is a neglected, complex resource;
- Requires *technology-led* thinking – which worries the risk-averse;
- Benefits from *bold actions* – which can go wrong;
- Needs creativity and *imagination* – which is not the planning tradition;
- Should involve the *IT function* – which is not normal;
- Is based on *faith* in the information age – which has been asked for before."

This section is closely allied to the previous section on IT in that modern MIS are computer based. The emphasis is on the provision of information in a timely manner and in a format that it can be used by management to guide decision making.

8.2.1 Types of Information

- *Financial*
  - Budgets
  - Income and expenditure
  - Cash flow
- *Personnel*
  - Terms and conditions
  - Pay
  - Holiday register
  - Disciplinary information
- *Assets*
  - Buildings and furnishings
  - Land
  - Vehicles
  - Equipment
- *Operations*
  - Vehicles: vehicle usage
  - Equipment: maintenance schedules; usage schedules
- *Research*
  - Experimental details; agronomic and yield records
  - Meteorological data

- Publications register
- Papers, leaflets, reports, posters

♣ *Stakeholders*

- Names and addresses
- Location
- Coffee holdings
- Farm yields and agronomic data

Whilst there are many specialist software packages available to store and manage these types of data *we recommend* that TaCRI adopts the same principle as for IT of a cautious approach and phased development.

We recommend that the cornerstone of this approach is to base the data storage and analysis on Excel. This spreadsheet has the benefit of being ubiquitous, accessible to many even with fairly limited training, with very powerful data storage, analysis and presentation capabilities.

8.2.2 Finances, Personnel, Assets and Operations

The step from TaCRI's current entirely manual system to a computerised record keeping system is not to be taken lightly. It requires considerable organisation and training in order to ensure that vital information is not lost or incorrectly entered. It is, however, an essential step as TaCRI's budget and responsibilities to stakeholders grows and *we recommend* that TaCRI move as soon as possible to computerised recording of finances and personnel issues.

The two prerequisites for success are:

1. A competent manager to implement and run the system
2. A simple system that is understood by as wide a range of people as possible.

We recommend therefore that TaCRI employs an accountant with excellent computer skills (especially with spreadsheets) to take responsibility for designing and implementing the MIS.

We recommend that a spreadsheet-based approach to recording expenditure is adopted where each transaction is recorded in one row with columns indicating, date, month, quarter, voucher number, department code, budget heading code, budget sub-heading code, item description and amount. This is no different from the information in the current expenditure ledger other than there is extra information to allow expenditure by departments to be tracked in greater detail. The Excel Pivot Table function can then be used to summarise the information in a number of ways with considerable flexibility. This system has been implemented successfully by the Tea Research Institute of Tanzania as a way of providing information on expenditure to budget managers so that they can check regularly on progress against activity budgets.

A similar approach can be used to record cess and other income. By including a number of attributes detailed analysis of the information is possible. For example, information on the origin, type and quality of coffee sold, and the price and the identity of the buyer achieved, would allow not only the amount of cess due to be calculated but also a detailed picture to be built up of stakeholder activity.

8.2.3 Research Information

Research information is the underlying resource on which TaCRI depends. Heads of department should therefore take responsibility for ensuring that data on, for example, site plans, treatments, methodologies and results are readily available, properly documented and archived. Paper copies together with fully annotated documents and spreadsheets must be kept in a safe location. Soft copies on CD-ROM should be kept separately in a fire proof safe.

8.2.4 Stakeholder Information

Information on the identity and activity of coffee growers can be built up over time. This could include information gathered by the TTTU on the age and type of coffee, the yield and agronomic practices, together with other information on the farming system, and soil analytical results. A valuable resource such as this would best be stored a database such as Microsoft Access and could be coordinated by the Livelihoods and Income Security Department.

Plate 13. New cuttings of disease resistant clones in the Lyamungu nursery: January 2003.

9 PARTNERSHIPS

The following organizations have been identified as possible partners with whom TaCRI can seek to work together on issues of mutual interest, listed in alphabetical order. *Note*: this is not necessarily an exclusive list.

9.1 National

District Councils. Close collaboration on all aspects of technology transfer and training

Ministry of Agriculture and Food Security, Department of Research and Training. Collaborative research.

Sokoine University of Agriculture: partnerships on socio-economic research (coffee farming systems) and agricultural engineering studies (coffee processing).

Tea Research Institute of Tanzania: sharing experiences; joint meetings; met-recorder training.

Tropical Pesticides Research Institute, Arusha: cooperation and delegation of responsibility for screening of pesticides for the control of coffee diseases and pests in regard to efficacy and toxicity.

University of Dar es Salaam: engineering department; coffee processing.

9.2 Regional

Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), with head office in Entebbe, Uganda: membership.

Coffee Research Foundation, Ruiru, Kenya: information exchange on coffee (Arabica) research; training of TaCRI research staff (in particular on plant breeding, pathology and integrated pest management); and possible acquisition of useful breeding material.

Coffee Research Institute, Kituza, Uganda: cooperation on Robusta coffee research, in particular on the problem of coffee wilt disease (*tracheomycosis*), and selection for host resistance in some '*erecta*' Robusta clones; possible acquisition of resistant clones.

Coffee Research Network (CORNET): new ASARECA network on coffee research with technical backstopping by CABI, UK. Active membership: TaCRI to promote regional collaboration, sharing of information, exchange of breeding material, and joint research to avoid duplication.

9.3 International

African Coffee Research Network (ACRN), with head office in Abidjan, Ivory Coast: membership.

Association Scientifique Internationale du Café / International Coffee Science Association (ASIC), with head office in Paris. ASIC has provided the forum for coffee scientists and technologists from all over the world to present and discuss the latest developments in all aspects of coffee science and technology. It will hold its 20th International Symposium on Coffee Science in Hawaii, October 27-31 October 2003. Membership and participation in ASIC symposia (these are held once every two years).

Central Coffee Research Institute (CCRI), Balehonnur/ Bangalore, India: cooperation recommended with emphasis on methods of integrated management of major pests in coffee (e.g. white stem borer, coffee berry borer).

Centre de Cooperation Internationale en Recherche pour le Developpement (CIRAD), Montpellier, France. Continued cooperation, particularly in respect of mass multiplication of hybrid cultivars by somatic embryogenesis.

Centre Technique de Cooperation Agricole et Rurale/ Technical Centre for Agricultural and Rural Cooperation (CTA): continued membership (TaCRI has recently become a subscriber) for access to the CTA sponsored SDI (Selective Dissemination of Information) service to ACP countries. It is jointly operated by CABI Bibliographic Services, UK, and by CIRAD, France.

Centro d'Investigacao das Ferrugens do Cafeeiro / Coffee Leaf Rust Research Centre (CIFC) Oeiras, Portugal: continued cooperation, particularly in respect of identification and verification of (new) physiological races of coffee leaf rust in Tanzania, as well as exact genotype for SH rust resistance genes of the new hybrid cultivars.

International Coffee Organization (ICO), London. Research and market information; verification of liquor quality of new hybrid cultivars.

International Institute of Parasitology (IIP), St Albans, UK: cooperation in regard to monitoring and control of insect and nematode pests in coffee.

Institut de Recherche pour le Developement (IRD), Montpellier, France. Cooperation in coffee breeding research, particularly in respect of biotechnological applications in coffee, such as molecular markers for germplasm identification and breeding (medium-term); in the long-term also genetic transformation particularly in respect of host resistance to major insect pests (cannot be achieved by conventional breeding).

9.4 Action

We recommend that immediate action is taken to develop regional links, particularly with the Coffee Research Foundation, Ruiru, Kenya, and the Coffee Research Institute, Kituza, Uganda. These are needed to facilitate (a) the provision of disease resistant cultivars (Arabica and Robusta), (b) staff exchanges and professional development, and (c) the development of joint work programmes (to avoid duplication of effort). Since the European Union contributes funding to all these three organisations, it is in its interest to actively encourage cooperation in these ways, as well as for the east African coffee industry generally. Initial attempts at dialogue by the Chief Executive Director have not yet met with success, and he may benefit from support at a higher level, for example from the Board of Directors. Perhaps TaCRI could offer to host conference/workshop, sponsored by the EU, and promoted by CORNET, with the aim of agreeing how to establish effective regional links for mutual benefit.

10 FINANCIAL MANAGEMENT

In order to be sustainable, TaCRI must achieve its objectives within the financial limits imposed by the availability of cess income, income from commercial coffee production, and from the sale of plant material. Donor funds such as those currently available through STABEX should not be relied upon, but should be used for specific projects with limited timescales and to help get TaCRI to a position where it is self reliant.

10.1 Cess Income

Cess income is likely to be very variable and is therefore extremely difficult to predict for next year, let alone for five years time. Projections of world production by the ICO suggest that prices are very depressed at the moment as buyers are factoring in the expected record Brazilian crop. However, in the following year prices may rise, as the Brazilian crop is likely to fall to between 25 – 30 million bags (60 kg).

The Tanzania Coffee Board keeps the most detailed information on coffee production and sales in Tanzania. Their production and price forecasts have therefore been used for predicting cess income. However, a recent World Bank (2002) report expressed concern over the accuracy of these statistics. The report points out that, although coffee for export must be sold through the auction (and should therefore be properly recorded) there are wide discrepancies in both production figures and prices from different origins, all quoting the TCB as their source.

Table 3. Projected Tanzanian coffee production and auction prices for 2002 -2007 (TCB, 2002)[5]

Season	Type of coffee	Estimated annual production (t)	Projected auction price ($/kg)
2002/03	Arabica	31,000	0.90
	Robusta	24,000	0.38
	Hard Arabica	3,600	0.42
2003/04	Arabica	24,876	0.98
	Robusta	19,024	0.45
	Hard Arabica	2,500	0.51
2004/05	Arabica	28,530	1.05
	Robusta	21,730	0.49
	Hard Arabica	2,800	0.58
2005/06	Arabica	30,430	1.30
	Robusta	23,370	0.61
	Hard Arabica	3,200	0.74
2006/07	Arabica	29,550	1.50
	Robusta	22,500	0.70
	Hard Arabica	2,900	0.83

We therefore have considerable reservations about using the figures in Table 3 as the basis for projecting cess revenues for TaCRI. After receiving advice from the EU and

[5] Letter Ref No. OP-6-21GEN of 26 August 2002 from TCB DG to TaCRI Chief Executive Director.

others we have reduced the Robusta production figures by 35% to an average of just over 14,000 t annum^{-1} to give a more realistic estimate of actual production.

Careful monitoring of the auction quantities and prices will be essential to ensure that TaCRI is able to claim all cess due. Equally careful management of TaCRI budgets will be critical with quarterly reviews and contingency plans for any shortfall in income arising from low world market prices or reduced production.

Taking a more optimistic view, the future impact of TaCRI on production has not been factored into these projections, and production may therefore be greater than anticipated by the TCB. Furthermore, the overall budget for TaCRI over the next five years appears to be sound, based on a cess rate of 1.2%.

One of the EU conditions for the release of STABEX funds for TaCRI is that the industry should accept an increase in the rate of cess to 1.2%. Stakeholders therefore need to commit to paying this increased rate. Other negotiations to reduce the local government cess of 5% should be encouraged but are outside the immediate remit of this report.

10.2 STABEX Funding

The availability of €9 million from STABEX funds provides the opportunity for much needed rehabilitation and capital expenditure and also to establish an endowment fund to provide continuing funding in the longer term.

STABEX endowment fund: we strongly support the EU proposal to establish an endowment fund for TaCRI to sustain coffee research for development. *We recommend* that the amount invested in the endowment fund is increased from €4.5 million to €5 million to enhance the long term sustainability of TaCRI and to provide a greater buffer against fluctuations in coffee production and prices. The management of the fund will require close financial control and prudent investment. It would also be very beneficial to TaCRI if the remainder of the STABEX funds were placed in a sinking fund account so that interest accrued during the life of the project is also available to TaCRI.

We recommend that the experience reported in the TAGREF (2002) report and direct advice from the EU is taken into account when constituting the fund.

Particular issues to note include:

- ♣ The fund should be independent of any other endowment funds proposed for agricultural research within Tanzania.
- ♣ The fund should be administered by the TaCRI CED rather than by an independent secretariat as indicated in the TAGREF (2002) report.
- ♣ The TaCRI Board of Directors should be responsible for good governance of the endowment fund.
- ♣ The TAGREF report used an interest rate of 4.8%. However, a rate of 3.4% decreasing to 3.2% by 2005/6 has been assumed to take into account transaction charges and lower interest rates currently prevailing.

Other STABEX funds: the funds for rehabilitation and capital equipment also require very careful management in order to comply with the EU regulations. Careful attention needs to be paid to drawing up the annual work plans, and to specifying the capital equipment. Incorrectly specified equipment will not serve TaCRI's objectives. *We recommend* that TaCRI contract in a specialist to help with this task, which is quite

demanding. It will substantially speed up the tendering procedures, if as much equipment as possible is categorised for local purchase.

10.3 Income from TaCRI Products and Services

Leased land: *we recommend* that the both the Usagara and northern blocks at Lyamungu totalling 79 ha should be advertised for leasehold including the pulpery and the house. The 126 ha of land at Mbimba should also be advertised with preference for it to be leased as a single block.

Plant material: it has been demonstrated elsewhere that farmers value and care for planting material more if they have paid for it rather than receiving it free of charge.

Soil and plant analysis services: we recommend that soil and plant analysis services offered by the crop nutrition department should be charged for at commercial rates. Reduced rates can be offered to cess payers. For example, estates could be charged at slightly less than the commercial rate, and smallholders (farmer groups) at perhaps half rate, sponsored through District Council (or Tanzania Coffee Board) Crop Development Funds. A slow build up to full charging may be necessary.

Coffee income: once the main production areas have been leased, TaCRI will remain with about 42 ha of coffee in demonstration blocks and experiments. It is anticipated that, with money available for inputs, productivity could increase rapidly reaching 1.8 t/ha by 2005. This coffee will be processed in the small factory, with the proceeds helping to fund TaCRI research.

It is important that careful records are kept of the inputs and costs of producing the coffee so that the net income can be calculated accurately.

10.4 Other Funding

10.4.1 Coffee Development Fund

The Coffee Development Fund is currently administered by TCB. If TCB is restructured the fund may be better administered by the Coffee Forum. TaCRI should be able to gain access to this fund for the development of the coffee industry.

10.4.2 External Funding

TaCRI should also be actively seeking external funding for its activities. This could be in partnership with organisations such as those listed in Chapter 9.

10.5 Strategic Action Plan Budget

The budget has been devised to maximise the resources available to TaCRI to undertake its core functions based on a prudent planning to ensure sustainability. This approach is enhanced by maximising the proportion of EU STABEX funds invested in the endowment fund.

Using the information and assumptions on income above, we have allocated resources to reflect the diverse geographical spread of the coffee industry and the priority activities identified in this report. Substantial funds have been allocated for the rehabilitation of Lyamungu Coffee Research Centre and for essential equipment required for the effective functioning of the research departments. These funds include provision for the information technology and management information systems strategies aimed at bringing TaCRI into the 21st century.

The budget has been designed to return a small surplus to TaCRI each year. It should be noted, however, that since the majority of expenditure (excluding Capex) is in TSh and the majority of the income is tied either to the Euro or the US dollar, the surplus is disproportionately sensitive to relatively small changes in exchange rates. The annual surplus is intended to provide a further safety margin against the volatility of cess income. Any surplus should be invested into a sinking fund from which both income and capital can be drawn should the need arise. A series of three-month bank deposits would ensure that money is available at reasonable notice.

In conclusion, we believe that through this Strategic Action Plan, TaCRI has the opportunity to make a vital contribution to the coffee industry in Tanzania through appropriately planned and funded *research FOR development*.

Plate 14. Coffee growing at the foot of Kilimanjaro: January 2003.

Annex 1 : TaCRI Action Plans 2003 – 2008

1. Crop Improvement Department: Action Plan 2003 - 2008

1.1 Human resources

A plant breeder should be recruited without delay. Minimum academic requirements include a PhD in plant breeding (e.g. quantitative genetics; familiar with IT and basic knowledge of molecular biology). Prior experience in applied plant breeding is an advantage, but not necessarily in coffee. He/she should have a practical mind, be inclined to team work and capable of leading and motivating senior, as well as junior staff and workers of the breeding department.

A senior coffee breeder (preferably ex East Africa) should be invited as visiting consultant for the breeding programme, to initiate the new coffee breeder in all relevant aspects of coffee breeding and variety development for the Tanzanian coffee industry, with emphasis on Arabica coffee. This consultant may have to visit TaCRI twice yearly for the next 2-3 years to speed up the required transfer of knowledge and technology for maximum efficiency and output of the breeding and variety propagation programmes.

After an initial six-month period on the job and exposure to the visiting consultant, the new breeder should be allowed a three-month visit to the Coffee Research Foundation in Kenya to become acquainted with the breeding programme, which had very similar objectives to the TaCRI programme. It has already produced successful hybrid cultivars of Arabica coffee since 1986.

1.2 Breeding and variety release

Basically, it should be left to the visiting breeding consultant to draw up a detailed plan for further selection, breeding and variety release, together with the TaCRI plant breeder. The recommendations below are intended to provide a broad outline of the steps to be taken to maximize speed and efficiency in the development and release of new disease resistant cultivars urgently required by the Tanzanian coffee industry.

1.2.1 Short-term programme

Reconfirmation of the candidate trees within the best breeding progenies of the SC series planted in field trial 27 as head of clone. Initial vegetative propagation by cuttings is required to produce clones large enough to establish a number of clonal comparative trials for definite selection of clones which meet all requirements of disease resistance, yield as well as adequate bean and liquor quality. In the meantime, all these clones should have been tested for their suitability for prolific somatic embryogenesis. Those clones, which have passed the test in the field and in-vitro, will then be ready for mass-multiplication through somatic embryogenesis, preferably through a commercial tissue culture laboratory. *Likely year of release and first large-scale distribution to coffee growers: 2007-08.*

In the meantime, 11 clones have already been multiplied in a pilot project with CIRAD to test the methodology of multiplication by somatic embryogenesis. These and others from conventional propagation by rooted cuttings are already being distributed to interested large and small growers as a pre-release phase intended for large-scale testing

on-farm. The growers should be made to understand that apart from the disease resistance the exact yield and quality characteristics have not yet been established, but that the indications from experimental plots are promising. Lyamungu should monitor these planted clones and sample them regularly for quality samples, e.g. at a nearby large estate (APK) 1000 plants each of 4 clones developed from somatic embryos were planted in December 2001 and will reach 1st harvest in 2003. *The current mass multiplication programme being developed by the TTTU to produce 5 million plants a year by 2007 must be conditional on the official release of those clones for general use by the TaCRI Board. This will require confirmation that the yield and quality of these clones is sufficient to maintain or enhance Tanzania's reputation for high quality coffee. Initial indications are promising and this confirmation should be possible in 2003 based on samples from plants released for large-scale evaluation in 2001.*

1.2.3 Medium-term programme

This involves in the first instance the development of a compact type hybrid cultivar based on F1 crosses between selected trees of Catimor lines and trees selected within the breeding progenies in field 23 (1986-88 crosses) and field 27 (1982-84 crosses). Catimors are homozygous for the dominant Ct gene for short internodes and any crosses between the short Catimor and normal tall coffee trees will produce uniformly short plants (generally slightly taller due to hybrid vigour) in the F1 progeny. Both parents should be carefully selected based on individual performance and that of the whole progeny or line for resistance to CBD and CLR and yield. Bean and liquor characteristics can only be determined from the mean of the whole progeny, since the amount of ripe cherry harvested at any time from a single tree will be too small for an adequate quality sample of clean coffee (250 g). Numerous crosses between selected Catimor and tall trees from the breeding progenies will have to be tested in field trials to enable identification of the best combinations. Selected trees within these elite F1 hybrids can subsequently be fixed as hybrid clonal cultivars and mass-propagated through somatic embryogenesis. *Expected year of first release of compact growing cultivars: 2010-2011.*

The same selected trees from breeding progenies in fields 23 and 27 can also be used as head of clones for initial multiplication by cuttings and testing of field performance and quality in a number of clonal trials. The best clones can then be mass propagated by somatic embryogenesis and released as hybrid clonal cultivars to those growers who prefer conventional 'tall' coffee trees.

1.2.4 Alternative programme

The F1 hybrid cultivar Ruiru II developed at the CRF in Kenya meets all the requirements of resistance to CBD and CLR, yield and quality characteristics for the Tanzanian coffee industry. It has also the preferred short plant stature and is propagated by seed. Earlier requests for seed have apparently been declined export clearance by the Kenyan Government a few years ago. However, it would be worthwhile trying to submit once again a request for a limited quantity of seed, this time to be considered as extremely valuable genetic resources for breeding purposes and to be paid for accordingly.

The 15-year breeding programme was funded equally by the Kenyan and Netherlands governments to a total of about €7 million. A quantity of about 5 kg of seeds from 10 distinct F1 combinations between selected female (Catimor) and male (clone issued from the breeding programme) parents also utilized for regular seed production (artificial cross pollination) could be worth $150,000. This amount represents less than

0.5% of the original development costs through breeding and field-testing during the period 1971-1985 (first release of Ruiru II in 1986 and should be very attractive for the CRF to finance amongst others a much needed rehabilitation of the breeding department, while for TaCRI it would be an opportunity to obtain an end-product of plant breeding at a tiny fraction of the total development costs. There is a precedent to such transaction to be found in the tea industry. The Tea Research Foundation of Central Africa (based in Malawi) has offered to sell individual tea clones to non-members for about $40,000 each. In the case of Ruiru II each of the 10 crosses could be compared to a distinct tea clone.

An alternative approach would be to obtain Ruiru II (and wilt resistant Robusta clones from Uganda) through regional germplasm exchange as part of the regional collaboration programme. This programme would need the active support and participation of the Board and the EU to link with other EU funded coffee programmes in Kenya and Uganda. The main constraint to the success of this approach is the reluctance of both Kenya and Uganda to release clones since TaCRI has no proven germplasm suitable for exchange. Hence political pressure at a high level may be required for this approach to succeed.

Ruiru II may have been planted on some estates and by smallholders through informal introduction of seed from Kenya into Tanzania. Such material should not be used for clonal multiplication to avoid possible misunderstanding in the general policy environment.

Once successfully negotiated, the 500 g seeds of each cross should provide enough seedlings (>800) for extensive field trials and verification of resistance and quality over a period of 5 years. Individual trees within the best crosses should then be multiplied by somatic embryogenesis and released as hybrid clones. *Expected year of first release, assuming receipt of seed in 2003, should be: 2008-2009.*

1.3. Support for plant pathology

1.3.1 Controlled-temperature rooms

The controlled temperature building as such is all right but it requires major renovation and repairs, such that the larger room is equipped as the CBD inoculation room (more shelves, fluorescent light above each shelf, and installation of an air-conditioner for cooling and heating). The smaller room should be allocated as a seed store (shelves and installation of one air-conditioner for cooling purposes only). Budget estimated at €50,000.

1.3.2 Main laboratory

The laboratory structure is sound but needs renovation of bench tops, repairs of ceilings electrical wiring and other fittings, as well as replacement and extension of essential equipment, materials and chemicals. The plastic boxes and trays used at present for the CBD pre-selection test on germinated seedlings need to be replaced and a large number of larger trays with tight fitting lids will have to be purchased. Estimated budget €60,000.

1.3.3 Standardization of CBD pre-selection test

The CBD pre-selection test on 6-week old seedlings needs improvement in order to increase the output and correlation with inherent field resistance. The pathologist should be given the opportunity to become familiar with current methodologies by making a study visit of about one month to the Coffee Research Foundation in Kenya.

1.4. Multiplication of hybrid cultivars

1.4.1 Tissue culture laboratory at TaCRI

A small tissue culture laboratory should be installed for the purpose of assessing the ability of selected trees for propagation though somatic embryogenesis and to start multiplying hybrid clones for field testing and pre-release to the coffee industry. No tissue culture laboratories appear to exist in the vicinity at the moment, which could provide such a service to TaCRI on a contract basis. An old laboratory building could be converted into such a TC laboratory according to the CIRAD design and list of equipment (Berthouly, 1999, 2001). CIRAD should also take care of training and provide technical advice. Total budget for renovation of building, equipment, laboratory materials and chemicals, training and consultancy services is estimated at around € 100,000.

1.4.2 Nursery

The present nursery is currently being renovated and extended to increase its capacity for raising seedlings and clonal plants. The recently built acclimatisation building for somatic embryos needs to be improved (insulation of walls and ceiling, proper windows, ventilation) to avoid excessive temperature fluctuations. There will continue to be a need for conventional propagation by rooted cuttings, at least until the TC system producing somatic embryos is in full operation, but also as an alternative in case of emergency (break-down of the TC system) and for breeding purposes. The propagation frames need renovation and some new propagators of the advanced 'Laming' model (as used with success at the CRF in Kenya) should be installed. Total budget for nursery improvement about € 10,000.

1.4.3 Mass-multiplication of released hybrid cultivar

The successful operation of the tissue culture laboratory by TaCRI over the next two years is a prerequisite to the following phase of mass multiplication of released hybrid cultivars by a much larger laboratory with a capacity of at least 10 million somatic embryos per year. Such a laboratory should be operated on a commercial basis with investment by the private sector, preferably outside TaCRI. CIRAD has indicated its interest to be of assistance in the required large-scale transfer of technology to such a commercial TC laboratory.

1.5 Selection of Robusta clones

Selection of Robusta clones for resistance to Fusarium wilt, or tracheomycosis, at the Maruku Agricultural Research Institute should be continued. The Coffee Research Station at Kituza, Uganda, should be requested for advice on methodologies, based on their extensive experience with this disease. Additional Robusta clones may also be requested with known tolerance/resistance.

Propagation of clones derived from Robusta trees with resistance to Fusarium wilt, which is true for practically all of the *erecta* plant type, to be continued by conventional means of rooted cuttings.

1.6 Implementation schedule

See following page.

IMPLEMENTATION SCHEDULE
TaCRI – Crop Improvement Department

S/n	Activity	2002/2003			2003/2004				2004/2005				2005/2006				2006/2007				2007/2008			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
0	***Staffing***																							
0.1	Advertise, interview and appoint staff																							
0.2	Prepare for arrival of new staff																							
1	***Breeding support***																							
1.1	Identify and appoint visiting consultant																							
1.2	Consultant visits																							
1.3	Breeder exchange visit to CRF Kenya																							
2	***Breeding and variety release***																							
2.1	*Release existing clones*																							
2.1.1	Rehabilitate all selection fields at TaCRI																							
2.1.2	Monitor 11 clones provisionally released to estates & S/H																							
2.1.3	Initiate clonal comparative trials from 1982-84 crosses (F27)																							
2.1.4	Select and propagate new clones for release																							
2.2	*Develop new Catimor disease resistant hybrids*																							
2.2.1	F1 Crosses between Catimor and Lyamungu selections																							
2.2.2	Progeny trials																							
2.2.3	Selection and mass propagation of elite F1 clones (2011)																							
2.3	*Regional collaboration on genetic resources*																							
2.3.1	Board level discussions with CRF on release of Ruiru II																							
2.3.2	Regional workshop on East African coffee																							
2.3.3	Obtain Ruiru II																							
2.3.4	Field trials of exchanged material																							
2.3.5	Selection and release of elite clones																							
3	***Plant Pathology***																							
3.1	*Controlled temperature room (CT)*																							
3.1.1	Get specification and tenders for CT room																							
3.1.2	Rehabilitate CT rooms																							
3.2	*Pathology laboratory*																							
3.2.1	Get specification and tenders for pathology lab																							
3.2.2	Rehabilitate pathology lab																							
3.2.3	Pathologist training visit to CRF																							
4	***Multiplication of hybrid cultivars***																							
4.1	*Tissue culture (TC) lab*																							
4.1.1	Specify tender for TC lab based on CIRAD design																							
4.1.2	Install TC lab																							
4.1.3	Commission and operate TC lab																							
4.2	*Rehabilitate nursery*																							
4.3	*Mass multiplication of released hybrid cultivars*																							
5	***Selection of Robusta clones***																							
5.1	*Selection for wilt resistance*																							
5.1.1	Continue selection process																							
5.1.2	Collaborate with Kituza on breeding																							
5.1.3	Obtain Kituza wilt resistant clones for evaluation																							
5.1.4	Establish clonal evaluation trials																							

2. Crop Productivity & Primary Processing Department: Action Plan 2003 - 2008

2.1 Background

Central to the future success of the coffee support industry in Tanzania is the need to increase productivity per unit area or per tree, depending on the farming system, to reduce costs of production, and to enhance quality at the level of primary processing. With the release of new cultivars, the focus of the work must be on developing crop husbandry practices to support the expected replanting programmes. The principal functions of this department are therefore to:

- To support the national coffee rehabilitation and replanting programme through effective research on crop husbandry practices and integrated pest management for the new cultivars grown in contrasting environments.
- To provide information, and to undertake research as necessary, on primary processing technologies.
- An additional activity is to be responsible for the collection, collation and reporting of meteorological data recorded at the Lyamungu CRC and each sub-station to assist with the extrapolation of the results of research from one region to another.

2.2 Activities

Over the five-year period the following activities are proposed:

1. Review all the available information on pruning techniques (including rejuvenation and rehabilitation), plant density, weed management, replanting methods and intercropping in coffee in order to:
    - Recommend to farmers appropriate, financially viable and practical technologies for immediate on-farm use and evaluation.
    - Identify the most promising researchable issues suitable for the coffee farming and livelihood systems in Tanzania, focusing on the new disease resistant, including semi-compact and dwarf, varieties.
2. Initiate a limited number of innovative trials to evaluate, and afterwards to demonstrate the most promising plant density and pruning regimes for new cultivars in order to provide advice to farmers on:
    - The optimum density and pruning regimes for different cultivars grown within different farming systems (including banana intercropping).
3. In the apparent absence of host resistance to any of the major insect pests, and the low priority to be given to screening new insecticides, review the results of research and practical experience on integrated pest management, including the use of botanicals, in Tanzania and other coffee producing countries in order to:
    - Identify those techniques likely to be of immediate value to farmers in Tanzania.
    - Identify the best ways of monitoring the build up of pest populations and their natural enemies, and hence of evaluating the success of IPM in keeping insect pests (particularly white stem borer, Antestia bug, and leaf miner) below economically acceptable threshold levels.

4. Initiate controlled experiments to evaluate the effectiveness of the most promising methods of integrated pest management, using the techniques identified above in order to:
    - Recommend to farmers how best to control insect pests without using sprays.
5. Quality control begins in the field, continues with harvesting, transport and primary processing techniques, including drying and storage. Although much is known about coffee processing, not all farmers are following best practice. There is a risk that Tanzania will lose its reputation for high quality coffees.
    - The immediate issue is to compile a list of procedures for ensuring good quality, including appropriate primary processing technologies, and their availability. This should be made available to farmers/primary societies/central pulperies. It should be possible to demonstrate good practice at all the TaCRI research centres.
    - Although no fundamental research is anticipated, links should be established with the Department of Engineering at the University of Dar es Salaam, and with Sokoine University of Agriculture should issues arise requiring solutions.
6. Meteorological stations need to be established/rehabilitated at each sub-station, recorders trained, and reporting and quality control procedures established.

2.3 Staffing

These are challenging tasks, with a diverse portfolio of activities. A senior agronomist working with an integrated pest management specialist, supported by three field officers are recommended, at least initially. Some external (regional) advisory support may be of value in the early years, as recommended for the Crop Improvement Department. Close working relationships need to be established with other TaCRI departments, particularly with the Technology Transfer and Training Unit and the Crop Nutrition Department.

2.4 Implementation schedule

See following page.

IMPLEMENTATION SCHEDULE

TaCRI – Crop Productivity & Primary Processing Department

		2002/2003			2003/2004				2004/2005				2005/2006				2006/2007				2007/2008			
S/n	**Activity**	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4
0	***Staffing***																							
0.1	Advertise, interview and appoint staff																							
0.2	Prepare for arrival of new staff																							
0.3	Staff training																							
1	***Existing technology review***																							
1.1	Review crop husbandry literature																							
1.2	Prepare report and leaflets																							
2	***Experimental programme***																							
2.1	Planning and approval of on-farm trials																							
2.2	Identify sites																							
2.3	Initiate trials																							
2.4	Monitoring and evaluation																							
2.5	Report, review, revise plans																							
3	***IPM review***																							
3.1	Review IPM literature																							
3.2	Prepare report and leaflets																							
4	***IPM experiments***																							
4.1	Planning and approval of experiments																							
4.2	Identify sites																							
4.3	Initiate trials																							
4.4	Monitoring and evaluation																							
4.5	Report, review, revise plans																							
5	***Primary processing***																							
5.1	Review primary processing literature																							
5.2	Establish links with SUA/Dar Uni																							
5.3	Prepare report and leaflets																							
6	***Meteorological stations***																							
6.1	Initiate met equipment tendering process																							
6.2	Install met equipment at sub-stations																							
6.3	Train met operators																							
6.4	Monitor and report weather at 4 stations																							

3. Crop Nutrition Department: Action Plan 2003 - 2008

3.1 Background

Declining soil fertility, associated with the lack of affordability of inorganic fertilisers or availability of organic manures, is one of the principal reasons for low and/or declining productivity of coffee in Tanzania. At a time of low coffee prices, even farmers who can afford to apply fertilisers must optimise their use if they are to attempt to remain profitable. Research needs to provide information that will help farmers to make rational decisions on how best to manage soil fertility. The function of this department is therefore:

- To develop, evaluate and promote cost effective and appropriate integrated soil fertility technologies, with a focus on new varieties, and
- To provide a high quality, reliable and sustainable soil and leaf analytical service to coffee farmers and supporting agencies

3.2 Activities

Over the five-year period the following research activities are proposed:

1. Review all the available national and international information on the integrated fertility management of coffee, including the role of agroforestry, in order to:
    - Recommend to farmers appropriate, financially viable and practical technologies for immediate on-farm evaluation.
    - Identify the most promising researchable issues suitable for the coffee farming and livelihood systems in Tanzania.
2. Initiate a limited number of on-farm trials in representative districts to evaluate the most promising technologies, involving combinations of inorganic and organic fertilisers, in order to provide advice to farmers on:
    - The optimum combination of manures to sustain profitable coffee production in pure and intercropped systems.
    - How best to produce, prepare, store, transport and apply organic manures.
3. Initiate on-station/estate experiments to determine the response functions of new cultivars grown at high densities to the major elements in order to
    - Provide advice to high input coffee farmers on the most profitable applications of N, P and K.
    - Develop and validate soil and leaf analytical services.
    - Determine potential yields.
    - Identify other soil fertility based limiting factors (e.g. micronutrients, pH).
4. Simple on-station evaluations of the cost effectiveness of locally mined rock phosphates (Panda and Mijingu) as alternatives to triple super phosphate as sources of phosphorus.

5. A functioning and efficient analytical laboratory[2] is needed at Lyamungu:
    - To support this research programme through base line, and regular soil and leaf analysis.
    - To provide advice to coffee farmers and others on demand.
    - To develop over time a database of the chemical properties of the soils in the principal coffee producing areas.

3.3 Staffing

A laboratory manger needs to be appointed, together with an equipment maintenance technician. In addition, four field officers are needed, two for the field experiments, two for laboratory work.

3.4 Implementation schedule

2002/03 Q2[3]. Initiate tendering process for new laboratory and analytical equipment. Begin recruitment process for laboratory manager. Begin systematic literature review on integrated fertility management. Identify partner laboratories.

2002/03 Q3. Continue review and prepare report; summarise results of previous soil fertility research at Lyamungu and recommendations to farmers (leaflet); plan and obtain approval for new field experiments; seek statistical help.

2002/03 Q4. Building begins; appoint laboratory manger; identify sites for priority trials in conjunction with TTTU.

2003/04 Q1. Procure and commission laboratory equipment; train staff; initiate priority trials.

2003/04 Q2. Continue as Q1; initiate laboratory quality control procedures.

2003/04 Q3. Continue as Q1; promote laboratory analytical services to the industry (leaflet).

2003/04 Q4. Monitoring and evaluating field experiments; review functioning of laboratory; identify gaps; review plans; plan new activities.

2004/05 Q1. Continue; report results of first year.

2004/05 Q2. Continue.

2004/05 Q3. Continue.

2004/05 Q4. Continue.

2005/06 Q1. Continue; report results of second year

2005/06 Q2.

2005/06 Q3.

2005/06 Q4.

[2] Laboratory and analytical facilities will need to be provided and skilled staff recruited and existing staff trained. Quality control procedures, involving regular cross checking of analytical results with other internationally recognised laboratories, will need to be instigated.

[3] Based on the TaCRI year from October to September.

IMPLEMENTATION SCHEDULE
TaCRI – Crop Nutrition Department

S/n	Activity	2002/2003			2003/2004				2004/2005				2005/2006				2006/2007				2007/2008			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
0	***Staffing***																							
0.1	Advertise, interview and appoint staff																							
0.2	Prepare for arrival of new staff																							
0.3	Staff training																							
1	***Existing technology review***																							
1.1	Review ISFM literature																							
1.2	Prepare report and leaflet																							
2	***On-farm trials***																							
2.1	Planning and approval of on-farm trials																							
2.2	Identify sites																							
2.3	Initiate trials																							
2.4	Monitoring and evaluation																							
2.5	Report, review, revise plans																							
3	***Experiments on new cultivars***																							
3.1	Planning and approval of experiments																							
3.2	Identify sites																							
3.2	Initiate trials																							
3.4	Monitoring and evaluation																							
3.5	Report, review, revise plans																							
4	***Experiments on phosphates***																							
4.1	Planning and approval of experiments																							
4.2	Identify sites																							
4.3	Initiate trials																							
4.4	Monitoring and evaluation																							
4.5	Report, review, revise plans																							
5	***Establish analytical lab***																							
5.1	Facilities development																							
5.1.1	Initiate tendering process for new laboratory and analytical equipment																							
5.1.2	Identify partner laboratories.																							
5.1.3	Build labs																							
5.1.4	Procure equipment																							
5.2	Initiate laboratory control procedures																							
5.3	Promote analysis services to industry																							
5.4	Provide analytical services																							

4. Livelihoods and Income Security Department: Action Plan 2003 - 2006

4.1 Background

Over 400,000 farmers and their families derive their livelihoods from coffee based farming activities in diverse geographic, ecological and socio-economic areas of Tanzania. Little is known about the contribution that coffee makes to the well-being of these families, and the social and economic factors that contribute to the sustainability and success of their contrasting agricultural and livelihood systems. If research is to be effective, the constraints to productivity and profitability need to be identified and evaluated, and appropriate interventions proposed, prioritised and evaluated. The function of this department is therefore:

- To describe and understand the diverse farming and livelihood systems in the coffee growing areas of Tanzania,
- To identify and to prioritise the constraints to productivity and profitability, and
- To propose, evaluate and promote possible solutions.

4.2 Activities

Over an initial three-year period the following research activities are proposed:

1. In representative districts within the principal coffee growing regions, to undertake social and economic surveys in order to:
    - Determine the role that coffee plays in the livelihoods of farming families.
    - Identify the principal constraints to coffee productivity and profitability, including for example farm size, and marketing.
    - Identify financially viable solutions to improve the livelihoods of coffee farmers.
    - Identify and prioritise researchable constraints.
2. Within selected communities, seek to overcome these policy, technical, social and /or economic constraints by:
    - Undertaking action research.
    - Assessing the impact on livelihoods and income security of selected interventions.
3. Through feedback and dialogue with colleagues, ensure that the work of TaCRI continues to be appropriate to the needs of coffee farmers by:
    - Communicating the implications of this research to other departments.
    - Advising on research and technology transfer and training priorities.
4. Where policy related issues are perceived to be a constraint to improved livelihoods:
    - Analyse the implication of policy decisions and initiatives on livelihoods.
    - Communicate the results of this research to policy makers at district, regional and national levels through the Coffee Forum.

4.3 Staffing

Appoint one economist and one rural sociologist both initially on three-year contracts. Performance will need to be assessed within the probationary period (six months), and decisions taken.

4.4 Implementation schedule

2002/03 Q2. Advertise, interview and appoint research staff:

2002/03 Q3. Prepare for arrival of new staff.

2002/03 Q4. Staff in post; study tour to familiarise staff with the coffee industry in Tanzania and associated livelihood issues.

2003/04 Q1. Plan surveys, and develop and test draft questionnaires.

2003/04 Q2. Conduct detailed surveys in four representative districts

2003/04 Q3. Analyse and summarise survey data; draw conclusions; develop action plans; write report; communicate results; advise on research needs; advise on policy implications.

2003/04 Q4. Initiate action research in two target districts; assess impact.

2004/05 Q1. Assess impact of action research.

2004/05 Q2. Assess impact of action research.

2004/05 Q3. Assess impact of action research.

2004/05 Q4. Analyse and summarise results of action research; draw conclusions; write report; communicate results; advise on research needs; advise on policy implications; revise action research programme.

2005/06 Q1. Implement new action research.

2005/06 Q2. Action research continued.

2005/06 Q3. Action research continued; complete data analysis; draw conclusions from three years work.

IMPLEMENTATION SCHEDULE
TaCRI – Livelihoods & Income Security Department

		2002/03			2003/04				2004/05				2005/06				2006/07				2007/08			
S/n	**Activity**	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4
0	***Staffing***																							
0.1	Advertise, interview and appoint staff																							
0.2	Prepare for arrival of new staff																							
0.3	Familiarisation tour																							
1	***Social and economic surveys***																							
1.1	Plan surveys; test questionnaires																							
1.2	Conduct surveys in four districts																							
1.3	Analyse, interpret and report on surveys																							
2	***Action research***																							
2.1	Initiate action research in two districts																							
2.2	Assess impact of action research																							
2.3	Analyse, interpret and report on action research																							
2.4	Write final report																							

5. Technology Transfer and Training Unit: Action Plan 2003 - 2008

5.1 Background

A core activity of this unit is to communicate the outputs from research to the industry, in formats and ways that are appropriate for different groups of stakeholders. The other is to facilitate the provision of improved planting material to farmers in anticipation of a major national replanting programme over the next few years. The functions of this unit are therefore to:

- Support the rejuvenation of the coffee industry by promoting and disseminating appropriate and financially viable, proven technologies to farmers and associated agencies.
- Facilitate effective two-way linkages between researchers, district extension staff and farmers.
- Develop and deliver training courses (training the trainers).
- Create market awareness, and an appreciation of cup quality, amongst coffee producers.
- Support the establishment of farmer and estate managed nurseries for the mass propagation of newly released cultivars.

The head of this unit will also be responsible for managing the Coffee Research Sub-stations at Maruku, Mbimba and Ugano.

5.2 Activities

Over the five-year period the following activities are proposed:

1. Communication strategy
    - Working with heads of research departments, extract, summarise, prepare, publish and distribute key technical messages, in appropriate formats, to previously identified groups of stakeholders, including: farmer groups, estates, district extension staff, NGOs, the private sector and policy makers at district, regional and national levels.
    - Working with heads of research departments organise field days for farmers at the research stations, visits to demonstration plots in villages, and attend farmer fairs and shows.
    - Make full use of the electronic media (radio, TV, audio and video cassettes) for disseminating extension messages to farmers.
    - Develop training materials for 'Training of Trainers' short courses for delivery to extension staff and farmer group leaders at the regional training centres. Courses to cover coffee husbandry, primary processing, budget management, and market awareness (with a focus on the importance of cup quality).
    - Deliver extension messages to district extension staff and farmers through the District Subject Matter Specialists and, using participatory approaches, provide village-based farmer training. Up to 20,000 farmers will eventually be trained annually in this way.

2. Provision of planting materials
    - To establish clonal (mother) gardens, initially at Lyamungu and afterwards at the TaCRI sub-stations, to provide cuttings of improved coffee hybrids for distribution to farmers.
    - To support the development of farmer/village/estate/NGO managed nurseries in all 12 target districts. Training will need to be provided.
    - The target is to produce 4-5 million cuttings annually by 2007. To achieve this 50 ha of clonal gardens (at 10,000 plants/ha) need to be established by 2006.

5.3 Staffing

To achieve these ambitious targets a substantial increase in the TTTU staff complement is needed, including the appointment of: a trainer (in post), a communication specialist (new); an audio-visual specialist (new); and four extension agronomists (one to be based at Lyamungu, and one each as officers in charge at Maruku (new), Mbimba (new) and Ugano (in post) sub-stations. Training will need to be provided for the new appointments.

5.4 Implementation Schedule

See following page.

IMPLEMENTATION SCHEDULE

TaCRI – Technology Transfer & Training Unit

		2002/03			2003/04				2004/05				2005/06				2006/07				2007/08			
S/n	**Activity**	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
0	***Staffing***																							
0.1	Advertise and interview for new posts 1) Communication specialist 2) Nursery Officer 3) Extension Agronomists																							
1	***Communication***																							
1.1	Work with research departments to unlock on shelf technologies																							
1.2	Packaging research recommendations																							
1.3	Prepare and run field days																							
1.3.1	Prepare field days																							
1.3.2	Demonstration plots																							
1.3.3	Electronic media																							
1.3.4	Farmer fairs																							
1.4	Initiate link with DCSMS																							
1.5	Training of extension staff																							
1.6	Training at Training Centres																							
1.7	Initiate & support VBT																							
2	***Supply of clonal hybrids***																							
2.1	On station clonal garden expansion																							
2.2	Training of nurseries and clonal garden supervisors																							
2.3	Linking with clonal propagators (districts, Estates, NGOs) & supply of mother trees.																							
2.4	Dissemination of clonal materials to farmers																							
2.5	Construction of on station VPU																							
2.6	Establishment of zonal nurseries																							
2.7	In-service training TT&TU staff																							

6. TaCRI Management: Action Plan 2003 - 2008

6.1 Background

The recommended actions for Management are detailed in the main text. An implementation schedule is presented below for convenience.

IMPLEMENTATION SCHEDULE
TaCRI – Management

S/n	Activity	2002/03 Q2	Q3	Q4	2003/04 Q1	Q2	Q3	Q4	2004/05 Q1	Q2	Q3	Q4	2005/06 Q1	Q2	Q3	Q4	2006/07 Q1	Q2	Q3	Q4	2007/08 Q1	Q2	Q3	Q4
0	***Strategic Action Plan***																							
0.1	Strategic Action Plan approved by Board																							
0.2	FMO signed																							
0.3	Funding modalities agreed																							
0.4	SAP implementation																							
0.5	SAP progress review																							
1	***Staffing***																							
1.1	Advertise, interview and appoint new staff																							
1.2	Finalise and implement redundancy plan																							
1.3	Appraisal system designed																							
1.4	Appraisal system implemented																							
1.5	Postgraduate training requirements reviewed																							
1.6	Teambuilding activities																							
2	***External relations***																							
2.1	Marketing strategy developed																							
2.2	Formal launch																							
2.3	Annual report published																							
2.4	MoU with MAFS																							
2.5	Coffee conference																							
2.6	Open day																							
2.7	Establish links with Kenya and Uganda coffee research																							
2.8	Establish international partnerships to support activities																							
3	***Policy Environment***																							
3.1	Revise Memarts																							
3.2	Revise Coffee Act																							
3.3	Establish Coffee Forum																							
3.4	Provide Secretariat for Coffee Forum																							
4	***Rehabilitation***																							
4.1	Prepare specification of rehabilitation works																							
4.2	Obtain quotations for rehabilitation works																							
4.3	Implement rehabilitation works																							
4.4	Review progress of rehabilitation																							
5	***Capital Expenditure***																							
5.1	Prepare specification of capital equipment																							
5.2	Obtain quotations																							
5.3	Purhcase equipment																							
6	***Information technology***																							
6.1	Specify computer equipment and obtain quotes																							
6.2	Purchase computer equipment and install																							
6.3	Identify IT training requirements and implement training																							
6.4	Commission TaCRI website																							
6.5	Review network requirements																							
6.6	Management Information System developed																							
6.7	Management Information System implemented																							
7	***Assets***																							
6.1	Transfer ownership to TaCRI																							
6.2	Dispose of obsolete/surplus assets																							
6.3	Lease surplus land																							
6.4	Review leasholds																							

Annex 2 : TaCRI Strategic Action Plan Logical Framework: 2003 – 2008

	Narrative	Objectively verifiable indicators	Means of verification	Assumptions and risks
Goal	A profitable and sustainable coffee industry in Tanzania.			
Purpose	Appropriate coffee technologies that will improve productivity and quality, within a supportive policy framework, resulting in increased competitiveness of Tanzania coffee in the world market, and ultimately reductions in poverty and improvements in the livelihoods of coffee growers developed and disseminated.			
Outputs	**Tanzania Coffee Research Institute** 1. A well managed, financially viable, customer focused, forward thinking, nationally and internationally respected, sustainable research institute established.	1(i). By 31 January 2003, the strategic action plan has been accepted and implementation has begun. 1(ii). By 31 March 2003, agreement reached with EU on STABEX funding. Coffee Forum established. 1(iii). By 1 August 2003, all senior staff in post. 1(iv). By 1 December 2003, details of all research programmes finalised, and implementation started. 1(v). By 1 August 2003, major rehabilitation of infrastructure underway, and capital equipment ordered. 1(vi). By 30 June 2003, Memorandum of Association revised and approved. Coffee Act amendments under review. 1(vii). By July 31 2004, Annual Report published.	Minutes of BoD EU records: FMU Minutes of BoD Staff records Report to TAP TaCRI Annual Report New MoA Annual Report distributed	Coffee industry survives present crisis. External support forthcoming. Suitably qualified and experienced staff available Board supportive of changes to Memarts. GOT prepared to amend Act.

	Narrative	Objectively verifiable indicators	Means of verification	Assumptions and risks
	Crop Improvement Department			
	2(a). High yielding, disease resistant Arabica coffee cultivars with good bean size and cup quality developed and released.	2a(i). By mid-2003, at least 11 new cultivars under evaluation on farm in at least six districts.	TaCRI Annual Report	Suitability of cvs confirmed.
		2a(ii). By early 2004, agreement reached with GoK to import Ruiru 11 germplasm.	MoU with CRF and GoK	GoK agree to negotiate.
		2a(iii). By mid-2005, new compact hybrid cultivar crosses being evaluated.	TaCRI Annual Report	
	2(b). Fusarium wilt resistant Robusta clones selected and released.	2b(i). By early 2004, agreement reached with Uganda Coffee Research Station on cooperation for Fusarium resistance selection programmes	MoU with Uganda Coffee Research Station	Uganda CRS agree to negotiate.
		2b(ii). By mid-2004, selections under evaluation at MCRS-S.	MARI contract reports	MARI agrees to contract research proposals.
		2b(iii). By 2006, promising Fusarium resistant selections being evaluated on farm in Kagera.	TaCRI Annual Report	Suitability of clones confirmed
	Crop Productivity and Primary Processing Department			
	3(a). Appropriate crop husbandry and integrated pest management practices for new cultivars, to support the rehabilitation of the coffee industry, developed and promoted.	3a(i). By early 2004, technical information packages produced on principal crop husbandry topics	Packages available	Information accessible
		3a(ii). By 2007, preliminary recommendations to farmers and estates on planting density and pruning techniques published.	Report available.	Resources available to undertake research
		3a(iii). By early 2005, advice on how best to control at least two major pests and one disease using IPM promoted.	Report available.	Information accessible.

	Narrative	Objectively verifiable indicators	Means of verification	Assumptions and risks
	3(b). Information on primary processing technologies accessible to producers and processors	3b(i). By mid-2003, brochure listing available technologies published, and links with SUA established.	Brochure available.	Information accessible.
	Crop Nutrition Department			
	4(a). Cost-effective and appropriate integrated soil and nutrient management systems evaluated and promoted.	4a(i). By end 2003, preliminary INM recommendations published;	Leaflets available.	Resources available.
		4a(ii) By mid 2004, on-farm INM trials established in at least four ecological zones.	TaCRI Annual Report	Information accessible.
		4a(iii). By 2007, detailed INM recommendations published.	Leaflets.	Resources available.
	4(b). A high quality and reliable commercial soil and plant analytical service for coffee farmers and supporting agencies operational.	4b(i). By mid 2004, laboratory operational.	Promotional leaflet	Equipment functional; staff trained; demand for service exists.
		4b(ii) By 2006, at least 1000 (?) samples being analysed annually (?) for the industry.	TaCRI Annual Report.	
	Livelihoods and Income Security Department			
	5(a). The diverse farming and livelihood systems in the coffee growing areas described and understood.	5a(i). By mid 2004, representative farming and livelihood systems in 4 leading coffee districts described and action research initiated.	TaCRI Annual Report.	Resources available.
	5(b). Constraints to productivity and profitability evaluated and prioritised and possible solutions promoted.	5b(i). By end 2005, possible solutions to the constraints identified in 12 districts promoted to researchers and policy makers.	TaCRI Annual Report.	Supportive agencies
	Technology Transfer and Training Unit			
	6(a). Appropriate, financially viable and proven technologies promoted and disseminated to farmers and associated agencies.	6a(i). By early 2004, detailed recommendations on all aspects of coffee production and primary processing packaged, and promoted to at least 50 farmer groups, and ten estates.	Leaflets and distribution records.	Information accessible Resources available.

	Narrative	Objectively verifiable indicators	Means of verification	Assumptions and risks
	6(b). Effective two-way linkages between researchers, district extension staff, small farmers and estates facilitated.	6b(i). By early 2005, in at least five districts, effective working relationships established with extension staff, farmer groups and estates, modelled on Mbinga experience.	District Council, DALDO and estate records.	District councils and NGOs and estates willing to cooperate.
	6(c). Nurseries producing new cultivars for the replanting programme developed.	6c(i). By late 2005, nurseries, managed by farmer groups and estates, established in 12 districts, fully operational by 2007 producing at least four million plants annually.	DALDO and TCB records.	Mass multiplication successful. Resources available. District Councils supportive
	6(d). Training courses for farmers developed and delivered.	6d(i). By end 2004, training materials on all aspects of coffee production and primary processing developed and tested.	Training materials available.	Sufficient number of trainers.
		6d(ii). By early 2005, at least 20 trainers trained in each of the 12 districts annually.	DALDO records.	
		6d(iii). By 2007, at least 10,000 progressive farmers have participated in training courses.	DALDO records	Farmers keen to be trained
	Support Teams			
	7(a) Physical infrastructure efficiently rehabilitated.	7a(i). By end 2004, offices, laboratories, roads and irrigation water supply fully functional.	TaCRI accounts Inspection report	Contractors employed are competent
		7a(ii). By mid 2005, houses and irrigation system renovated.	Inspection report TaCRI accounts	
	7(b) Capital equipment installed and functioning.	7b(i). By early 2005, all laboratory, field and IT equipment purchased and installed.	Inspection report TaCRI accounts	EU tendering system does not cause delays
	7(c) Commercial coffee areas leased.	7c(i). By early 2004, 79 ha of land leased for commercial coffee production.	Lease agreements	Sufficient interest from coffee growers
	7(d) Information technology strategy implemented.	7d(i). By end 2003, IT equipment purchased.	TaCRI accounts Inspection report	
		7d(ii). By end 2003, training programme in place.	TaCRI annual report	

	Narrative	Objectively verifiable indicators	Means of verification	Assumptions and risks
	7(e) Management Information System strategy implemented.	7e(i). By end 2003, accounts information computerised.	Soft copies of income and expenditure records	Appointment of suitably qualified accountant

TaCRI activities to support the strategic outputs

Responsible Department	Activities
Tanzania Coffee Research Institute (Management)	Output 1 2002/2003 1. Present SAP to Board for approval to implement. 2. Present budget to Board for approval. 3. Present budget for STABEX. 4. Recruit/appoint high quality staff to lead each dept. 5. Continue to change/improve working culture. 6. Initiate Coffee Forum. 7. Initiate rehabilitation of headquarter site. 8. Initiate tender process for capital equipment. 9. Revise Memorandum of Association/Coffee Act 10. Develop/confirm international partnerships; plan regional workshop. 11. Review function and membership of Technical Advisory Panel 12. Consider linking each Department to an external specialist subject area adviser.
All Departments/Unit	1. *Confirm priority activities and availability of resources.* 2. *Review, in detail, literature on subject area.* 3. *Develop further and refine detailed but realistic departmental action plans, with budgets.* 4. *Identify and appoint suitably qualified staff: provide training as necessary.* 5. *Liaise regularly with stakeholders; be proactive.* 6. *If possible, visit neighbouring coffee research institutes; establish informal contacts with scientists overseas.* 7. *Identify opportunities to bid for competitive research grants; take the necessary action.* 8. *Plan each experiment/activity carefully with clear objectives and outputs; seek statistical and technical advice; do not be too ambitious.* 9. *Seek formal approval to implement each new activity.* 10. *Report the results of your work to stakeholders regularly and on time.*

Responsible Department	Activities
Crop Improvement Department	Output 2(a) 1. Recruit a plant breeder, initiate into coffee breeding and take over as head of Crop Improvement Department in July-03. 2. Contract senior coffee breeding expert (preferably from East Africa) as visiting consultant with effect from 2003. 3. Rehabilitate all selection fields at TaCRI with optimum crop husbandry and inputs in 2003. 4. Renovate coffee nursery and acclimatisation room to be fully operative in 2003. 5. Renovate and equip plant pathology laboratory and controlled temperature rooms; train plant pathologist in the correct protocols for laboratory screening tests for CBD and CLR (at the CRF Kenya); effective support to the breeding programmes on pre-selection and selection by inoculation tests fully operative in 2003. 6. Negotiate with the CRF in Kenya on acquisition of seed from elite crosses of the compact-type Ruiru II hybrid cultivar and receipt by TaCRI in 2003/04. 7. Establish five multi-location field trials with 10 F1 progenies in 2004. 8. Publish results of on-farm (estates and smallholders) testing of 11 selected hybrid clones from the breeding programme (1st phase) in 2005 for final selection of 2-3 of the best hybrid clones (resistance, yield, quality). 9. Install pilot tissue culture laboratory at TaCRI and operating efficiently in 2003/04; technology of clonal multiplication by somatic embryogenesis of coffee fully transferred by CIRAD in 2004 (if needed). 10. Officially release 2-3 clones as new hybrid Arabica cultivars to the Tanzanian coffee growers in 2005. 11. Scale up mass multiplication by somatic embryogenesis of new hybrid cultivars by a large (commercial) tissue culture laboratory with technical support from CIRAD with effect from 2005 (if needed). Large number of plants ready for distribution to growers from nurseries for field planting in 2007-08. 12. Official release and mass multiplication (somatic embryos) of compact growing hybrid clonal cultivars developed from the Ruiru II material (introduced in 2003) with effect from 2009. 13. Official release and mass multiplication of compact growing hybrid clonal cultivars developed by TaCRI breeding programme (phase 2) in 2011. Output 2(b) 1. Contact the Coffee Research Station at Kituza, Uganda and negotiate cooperation in respect of selection for resistance to Fusarium wilt (tracheomycosis) in Robusta coffee by early 2004. 2. Release Robusta clones or seeds (from clonal seed garden with resistance to Fusarium wilt in 2005/06.

Responsible Department	Activities
Crop Productivity and Primary Processing Department	Output 3(a) 1. Review the available information on rehabilitation and replanting of coffee (national and international), and prepare a technical information package. 2. Review the available information on pruning of cultivars with different growth habits planted at different densities, and prepare a technical information package. 3. Review the available information on IPM in coffee, and prepare a technical information package 4. Identify researchable opportunities for each topic, taking into account farming and livelihood systems. 5. Identify new cultivars to be evaluated, comparisons to be made, and sites where work is to be undertaken 6. Arrange for plants to be propagated. 7. Implement experimental programme. 8. Review progress at regular intervals; record observations on tree performance; revise programme as appropriate. Output 3(b). 1. Collate all existing information on primary processing technologies. Identify those most appropriate for small farmers. Review needs. Inform stakeholders. Identify researchable issues. Establish links with UDSM and/or SUA engineering departments.
Crop Nutrition Department	Output 4(a) 1. Review the available information on integrated nutrient management of coffee (national and international), and prepare a technical information package. 2. Identify the most promising researchable issues suitable to the coffee farming and livelihood systems throughout the country. 3. Establish on-farm trials in representative locations. 4. Work closely with stakeholders, and review progress at regular intervals Output 4(b) 1. Initiate rehabilitation of analytical laboratory. 2. Procure and install equipment: train staff in its effective use; establish regular maintenance procedures. 3. Develop efficient analytical and reporting procedures. 4. Initiate a mechanism for quality control. 5. Promote a commercial advisory service to coffee growers (tea producers may also be interested in this service). 6. Deliver a fast and reliable service. Use funds generated to sustain the laboratory.

Responsible Department	Activities
Livelihoods and Income Security Department	Output 5(a) 1. Undertake socio-economic studies in principal coffee growing districts to identify livelihood strategies and opportunities for research intervention to reduce poverty. Output 5(b) 1. On-location problem focused research initiated: possible solutions identified and promoted to policy makers and others. Impact assessed
Technology Transfer and Training Unit	Output 6(a) 1. Liaise with Departments and elsewhere to retrieve and develop up-to-date technology packages in key subject areas. 2. Prepare materials in appropriate formats and disseminate widely. 3. Make structured visits to stakeholders. Promote extension messages. 4. Participate in all major shows and events attended by coffee producers and other stakeholders. 5. Promote outputs from research through the media. Output 6(b) 1. Strengthen/establish links with district extension staff, farmer groups and estates. 2. Involve TaCRI research and district extension staff in participatory research techniques. 3. Enhance market awareness amongst producers and processors. Output 6(c) 1. Agree how best to promote and support mass propagation and distribution of seeds/cuttings of improved cultivars. 2. Implement strategy in target districts; monitor effectiveness and respond accordingly. 3. Liaise closely with Plant Improvement Dept. Output 6(d) 1. Identify training needs. 2. Develop and test training materials. 3. Train the trainers, including district subject matter specialists. 4. Facilitate farmer training (including estate staff), and monitor effectiveness. 5. Facilitate in-service training of TaCRI staff.
Support Teams	Output 7(a) 1. Commission detailed surveys to confirm and refine indicative costings for infrastructure rehabilitation. 2. Appoint Clerk of Works to supervise rehabilitation. 3. Prepare tender documents for individual rehabilitation projects. 4. Appoint contractors, conforming to EU STABEX regulations. 5. Prepare interim and final inspection reports.

Responsible Department	Activities
	Output 7(b) 1. Prioritise capital equipment requirements within overall expenditure limits. 2. Prepare detailed specifications for tenders. 3. Check delivered equipment against tender specification. 4. Install and commission equipment. Output 7(c) 1. Accurately survey land to be leased to commercial coffee growers. 2. Identify and protect water right requirements for Lyamungu CRC. 3. Prepare tender documents and conduct tender process. 4. Review leasehold arrangements after two years. Output 7(d) 1. Prepare correctly specified tenders for IT equipment. 2. Identify IT training needs and commission appropriate training programmes. 3. Install and commission equipment. 4. Negotiate service contract for IT equipment support. 5. Commission contract for provision of TaCRI web site. 6. Appoint audiovisual specialist. Output 7(e) 1. Advertise for and appoint suitably qualified accountant to develop computerised MIS. 2. Employ/redeploy and train staff to accurately input data into MIS. 3. Use MIS to provide up-to-date information on income and expenditure for management decision purposes.

Annex 3 : TaCRI Budget 2003 - 2008

Tanzania Coffee Research Institute
Summary Budget (€): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8	Average proportion due to Robusta (%)	Average proportion due to Robusta (€)
Income								
Cess	1	432,700	382,200	471,400	626,900	697,900	18%	92,600
TaCRI income	2	67,300	86,000	112,200	144,700	177,700	0%	-
TaCRI endowment	3	228,500	191,700	166,500	163,300	161,000	18%	32,300
Donors	4	2,226,700	1,130,000	500,000	100,000	70,000	18%	142,800
Total Income		2,955,200	1,789,900	1,250,100	1,034,900	1,106,600	16%	267,700
Expenditure								
Management	5	244,700	284,900	269,100	287,600	358,200	18%	51,200
Crop Improvement	6	132,200	141,300	151,200	63,300	67,800	18%	19,700
Crop Productivity	7	98,400	105,400	112,800	55,200	59,000	18%	15,300
Crop Nutrition	8	110,400	118,000	129,800	73,300	78,500	18%	18,100
Livelihoods	9	49,700	53,300	56,900	34,600	36,800	18%	8,200
Technology Transfer	10	199,120	187,350	196,220	144,080	153,980	18%	31,200
Ugano Sub-station	11	59,700	58,600	62,400	64,300	68,700	0%	-
Mbimba Sub-station	12	59,700	57,400	61,200	63,000	67,300	0%	-
Maruku Sub-station	13	66,500	68,300	72,800	75,200	80,400	100%	72,600
Rehabilitation	14	846,900	321,400	-	-	-	5%	11,700
Capital expenditure	15	1,042,400	337,300	116,200	165,800	127,200	18%	63,400
Total expenditure		2,909,720	1,733,250	1,228,620	1,026,380	1,097,880	18%	291,400
Surplus/deficit	16	**45,480**	**56,650**	**21,480**	**8,520**	**8,720**	Robusta benefit	€ 23,700 /annum
Cumulative surplus/deficit		45,480	102,130	123,610	132,130	140,850		

Notes:

1 Cess calculation based on TCB production and price projections assuming full payment of 1.20%.
2 Includes sales of plant material, soil and plant analysis services and lease income.
3 Income from the €5,000,000 TaCRI endowment fund based on yield projections by TAGREF (2002) revised after comments by Board.
4 Income from Stabex and from other grants including collaborative projects.
5 Cost of Management staff, site management of Lyamungu CRC, TaCRI Board, TAP and external reviews.
6 Includes plant breeding and plant pathology activities.
7 Includes agronomy and integrated pest management activities.
8 Includes integrated nutrient management and soil & leaf analysis services.
9 Working on three year contract intially.
10 TTTU costs excluding substation operating costs.
11 Substations at Ugano and Mbimba included as separate line but managed by TTTU.
13 TaCRI activities based at Maruku ARI.
14 Renovation and refurbishment of infrastructure at Lyamungu and Ugano.
15 Covering laboratory equipment, vehicles and IT equipment.
16 To be transferred to a sinking fund.

Tanzania Coffee Research Institute
Income Summary (€): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Coffee cess		432,700	382,200	471,400	626,900	697,900
TaCRI products and services		39,600	58,300	77,300	109,800	142,800
Leased coffee areas		27,700	27,700	34,900	34,900	34,900
Endowment income		228,500	191,700	166,500	163,300	161,000
Donor income		2,226,700	1,130,000	500,000	100,000	70,000
Other grant income						
Total Income		2,955,200	1,789,900	1,250,100	1,034,900	1,106,600

Income Details (€)
Coffee production (t)

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Mild Arabica						
- Kilimanjaro						
- Arusha						
- Ruvuma						
- Mbeya						
- Tanga						
- Iringa						
- Kigoma						
- Morogoro						
- Rukwa						
Total Mild Arabica		31,000	24,876	28,530	30,430	29,550
Hard Arabica						
- Kagera						
- Tarime						
- Mwanza						
- Morogoro						
- Kigoma						
Total hard Arabica		3,600	2,500	2,800	3,200	2,900
Robusta						
- Kagera						
- Morogoro						
- Mbinga						
Total Robusta		15,600	12,366	14,125	15,191	14,658
Total Tanzania		50,200	39,742	45,455	48,821	47,108

Coffee prices ($/kg)

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Mild Arabica	$/kg	0.90	0.98	1.05	1.3	1.5
Hard Arabica	$/kg	0.42	0.51	0.58	0.74	0.83
Robusta	$/kg	0.38	0.45	0.49	0.61	0.70

Cess Income (€)					
Mild Arabica	341,600	298,500	366,800	484,400	542,800
Hard Arabica	18,500	15,600	19,900	29,000	29,500
Robusta	72,600	68,100	84,700	113,500	125,600
Total	*432,700*	*382,200*	*471,400*	*626,900*	*697,900*
Proportion of cess from Robusta	*16.8%*	*17.8%*	*18.0%*	*18.1%*	*18.0%*

Income details (€) continued
TaCRI products & services

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Yield from experimental area (kg/ha)		1,000	1,200	1,400	1,600	1,800
Coffee production (kg)		42,000	50,400	58,800	67,200	75,600
Income from coffee sales		*38,600*	*50,400*	*63,000*	*89,100*	*115,700*
Plants sold (number)		10,000	50,000	100,000	150,000	200,000
Income from plant sales		*1,000*	*5,000*	*10,000*	*15,000*	*20,000*
Soil and plant analysis (number)		-	400	600	800	1,000
Income from analysis		*-*	*2,900*	*4,300*	*5,700*	*7,100*
Total TaCRI products & services		*39,600*	*58,300*	*77,300*	*109,800*	*142,800*

Leased coffee areas

Lyamungu CRC						
Area leased (ha)		79	79	79	79	79
Lease rate (€/ha annum)		135	135	170	170	170
Mbimba CRS						
Area leased (ha)		126	126	126	126	126
Lease rate (€/ha annum)		135	135	170	170	170
Total lease income		*27,700*	*27,700*	*34,900*	*34,900*	*34,900*

Endowment fund (€)

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Initial investment						
€ 9,000,000		6,800,000	5,670,000	5,170,000	5,070,000	5,000,000
Average yield		3.4%	3.4%	3.2%	3.2%	3.2%
Endowment income		*228,500*	*191,700*	*166,500*	*163,300*	*161,000*

Donor Funds

EU STABEX funds (€)					
Funds against annual workplan	2,200,000	1,130,000	500,000	100,000	70,000
Government salary support	26,700				
Total Donor Funds	*2,226,700*	*1,130,000*	*500,000*	*100,000*	*70,000*

Tanzania Coffee Research Institute
Rehabilitation (TSh '000)

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Lyamungu CRC						
Water supply		25,000	-	-	-	-
Irrigation system		-	65,000	-	-	-
Building renovation		545,000	100,000	-	-	-
Other Infrastructure		75,000	35,000	-	-	-
Accounts		25,000	10,000			
Ugano Sub-station						
Rehabilitation		50,000	30,000	-	-	-
Mbimba Sub-station						
Rehabilitation		35,000	30,000	-	-	-
Maruku Sub-station						
Rehabilitation		35,000	30,000	-	-	-
Rehabilitation contingency - 5%		40,000	15,000	-	-	-
Total Rehabilitation		*830,000*	*315,000*	-	-	-

Rehabilitation Details (TSh '000)

Item	2003/4	2004/5	2005/6	2006/7	2007/8
Water supply					
- desilt Ziwani Dam	15,000				
- repair Makeresho Furrow	10,000				
	25,000	-	-	-	-
Irrigation system					
Desilt irrigation dam		12,000			
Pump and pump house		20,000			
Buried mains		15,000			
Portable mains		5,000			
Lateral pipes		5,000			
Fittings & bends		5,000			
Risers and Sprinklers		3,000			
Total Irrigation system	-	*65,000*	-	-	-
Renovation of buildings					
Offices and training centre					
Re wiring all buildings	20,000				
Repairs and repainting all buildings	30,000				
Laboratory refurbishment	200,000				
Security for computer rooms	10,000				
Station facilities					
Nursery	10,000				
Small coffee factory	25,000				
Houses					
Senior staff houses	150,000				
Junior staff houses	50,000	50,000			
Labour lines	50,000	50,000			
Total renovation of buildings	*545,000*	*100,000*	-	-	-

Rehabilitation Details (TSh '000)

	2003/4	2004/5	2005/6	2006/7	2007/8
Other infrastructure					
Domestic water supply					
- main pipe from spring	40,000				
- reticulation to houses		20,000			
Security					
Fence south-western boundary	15,000				
Station roads					
Grade and murram farm roads		15,000			
Replace tarmac on entrance road	20,000				
Total Other Infrastructure	*75,000*	*35,000*	-	-	-
Ugano Sub-station					
Replace generator	15,000				
Telephone connection	10,000				
Renovate office and training centre	20,000				
Renovate staff houses		30,000			
Upgrade propagation facilities	5,000				
Total Ugano Sub-station	*50,000*	*30,000*	-	-	-
Mbimba Sub-station					
Renovate office and training centre	20,000				
Renovate staff houses		30,000			
Renovate water system	15,000				
Total Mbimba Sub-station	*35,000*	*30,000*	-	-	-
Maruku Sub-station					
Renovate office and training centre	20,000				
Renovate staff houses		30,000			
Renovate water system	15,000				
Total Maruku Sub-station	*35,000*	*30,000*	-	-	-

Tanzania Coffee Research Institute
Capital Expenditure (€):2003 - 2008

Item	2003/4	2004/5	2005/6	2006/7	2007/8
New buildings - Lyamungu	50,000	75,000	-	-	-
Lab and Field Equipment	316,000	120,000	25,000	41,000	25,000
Vehicles	306,200	66,300	30,600	81,800	61,200
Information technology	100,200	30,000	34,600	30,000	30,000
Other capital expenditure	200,000				
CED's discretionary equipment budget	20,000	30,000	20,000	5,000	5,000
Contingency - 5%	50,000	16,000	6,000	8,000	6,000
Total Capital Equipment	*1,042,400*	*337,300*	*116,200*	*165,800*	*127,200*

Capital Expenditure (€): Details

New buildings - Lyamungu

Learning Centre		75,000			
Crop Productivity/nutrition	50,000				
Total new buildings	*50,000*	*75,000*	-	-	-

Research departments

Item	2003/4	2004/5	2005/6	2006/7	2007/8
Crop Improvement					
Tissue culture lab		100,000	5,000	5,000	5,000
Plant pathology lab	50,000	3,000	3,000	3,000	3,000
Controlled temperature lab	60,000	2,000	2,000	2,000	2,000
Total Crop Improvement	*110,000*	*105,000*	*10,000*	*10,000*	*10,000*
Crop productivity					
Coffee Nursery	-	2,000	2,000	2,000	2,000
Integrated Pest Management Lab	20,000	3,000	3,000	3,000	3,000
Meteorological equipment	20,000				
Total Crop Productivity	*40,000*	*5,000*	*5,000*	*5,000*	*5,000*
Crop Nutrition					
Laboratory equipment	150,000	10,000	10,000	10,000	10,000
Glassware	16,000			16,000	
Total Crop Nutrition	*166,000*	*10,000*	*10,000*	*26,000*	*10,000*
Livelihoods and Income Security					
Vehicles					
Management					
- CED (Discovery)				40,800	
Lyamungu pool					
- 1 x Defender 127 doublecab	30,600		30,600		30,600
- 1 x tractor & trailer + implements	35,700				
- 1 x vineyard tractor + implements	35,700				
- 4 x motorcycle	16,400			16,400	
- 1 x Defender station wagon	30,600				
Ugano Sub-station					
- 1 x Defender 127 Doublecab		30,600			
- 2 x Motorcycles	8,200			8,200	
- Tractor		35,700			
Mbimba Sub-station					
- 1 x Defender 127 Doublecab	30,600				30,600
- 2 x Motorcycles	8,200			8,200	
- Tractor	35,700				
Maruku Sub-station					
- 1 x Defender 127 Doublecab	30,600				
- 2 x Motorcycles	8,200			8,200	
- Tractor	35,700				
Total Vehicles	306,200	66,300	30,600	81,800	61,200

Capital Expenditure (€): Details

Item	2003/4	2004/5	2005/6	2006/7	2007/8
Information technology					
Computers	28,200	8,300	8,300	8,300	8,300
Printers	11,000	800	800	800	800
Networking			4,600		
Communications	10,000	5,000	5,000	5,000	5,000
Audiovisual equipment	51,000	15,900	15,900	15,900	15,900
Total information technology	100,200	30,000	34,600	30,000	30,000

Computer requirements

Department	Computer		Printer		
	Desktop	Notebook	Inkjet	Laserjet	Central
CED	3	1	1		
Accounts	3		1	1	1
Crop Improvement	2		1		
Crop productivity & PP	2		1		
Crop Nutrition	1	1	1		
Livelihoods & Income Security		2	1		
TTTU (Maruku)		1		1	
TTTU (Mbimba)		1		1	
TTTU (Ugano)		1	1		
TTTU	1	2	3	1	
Total	12	9	10	4	1
Existing	2	2	2	2	0
Required	10	7	8	2	1
Cost (€)	15,300	12,900	3,300	3,100	4,600

Technology Transfer & Training

Audiovisual equipment annual replacement costs	Number	Cost (€)	Replacement (years)	Annual replacement cost (€)
PowerPoint Projector	3	18,400	3	6,100
Overhead Projector	3	2,300	3	800
Screen	3	1,500	4	400
VCR	3	1,500	4	400
Portable generator	3	9,200	4	2,300
Digital video camera	1	1,500	3	500
Digital camera	3	2,300	3	800
Video editing computer	1	4,600	3	1,500
A0 laminating machine	1	2,000	4	500
A0 printer	1	7,700	3	2,600
Total Audiovisual Equipment		*51,000*		*15,900*

Other capital expenditure

Plant material	
Ruiru 11	150,000
Robusta clones	20,000
Automatic generator for Lyamungu	30,000
Total other capex	200,000

Research Departments Summary

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		83,600	89,300	95,400	102,000	109,000
Office costs		7,020	7,520	8,020	8,580	9,140
Repairs and Maintenance		5,000	5,350	5,710	6,090	6,490
Experimental and Lab Costs		16,800	17,940	22,570	24,100	25,750
Vehicle Runnning Costs		19,600	21,070	22,570	24,190	25,870
Subsistence		29,650	31,800	34,200	36,700	39,300
Collaborative projects		203,000	217,100	232,000	9,600	10,400
Contingency - 5%		18,300	19,500	21,200	10,600	11,400
Total Expenditure		382,970	409,580	441,670	221,860	237,350

Note: This breakdown allows totals for individual items of research expenditure to be viewed.
The location of the research worksheets should not be reorganised.
They should be in the order: improvement; productivity; nutrition; livelihoods.

Research Departments Summary

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				61,900	66,200	70,800	75,800	81,100
Pension and retirement benefits				6,100	6,400	6,700	7,100	7,500
Gratuity				12,500	13,400	14,400	15,400	16,500
Allowances				3,100	3,300	3,500	3,700	3,900
Total staffing				*83,600*	*89,300*	*95,400*	*102,000*	*109,000*
Office costs								
Communications		250,000	TSh/month	3,000	3,210	3,430	3,670	3,930
Printing & stationery		250,000	TSh/month	3,000	3,210	3,430	3,670	3,930
General office expenses		85,000	TSh/month	1,020	1,090	1,170	1,250	1,340
Total Office costs				7,020	7,510	8,030	8,590	9,200
Repairs and Maintenance								
Laboratory equipment		4,200,000	TSh/annum	4,200	4,490	4,800	5,140	5,500
Experimental equipment		800,000	TSh/annum	800	860	920	980	1,050
Total Repairs and Maintenance				*5,000*	*5,350*	*5,720*	*6,120*	*6,550*
Experimental and Lab costs								
Lab consumables		450,000	TSh/month	5,400	5,780	6,180	6,610	7,070
Chemicals and reagents		500,000	TSh/month	6,000	6,420	6,870	7,350	7,860
Field consumables		450,000	TSh/month	5,400	5,780	6,180	6,610	7,070
Casual Labour (mandays/month)	1,100	1,540,000	TSh/month	18,480	19,770	21,150	22,630	24,210
Total Experimental and Lab				*16,800*	*17,980*	*19,230*	*20,570*	*22,000*
Vehicle Runnning Costs								
Fuel & lubricants		140,000	km/year	14,000	14,980	16,030	17,150	18,350
Maintenance				2,800	3,000	3,210	3,430	3,670
Insurance & tax				2,800	3,000	3,210	3,430	3,670
Total Vehicle running costs				*19,600*	*20,980*	*22,450*	*24,010*	*25,690*

Research Departments Summary

Detailed Budget (Tsh '000) continued

Item	Note	Amount	Unit	Unit cost (TSh)	2003/4	2004/5	2005/6	2006/7	2007/8
Subsistence									
Visitors expenses		110	days	60,000	6,600	7,100	7,600	8,100	8,700
TaCRI staff T&S expenses									
- Head of Department		210	days	45,000	9,450	10,100	10,800	11,600	12,400
- Research Officer		120	days	40,000	4,800	5,100	5,500	5,900	6,300
- Field Officers		140	days	35,000	4,900	5,200	5,600	6,000	6,400
- Driver		130	days	30,000	3,900	4,200	4,500	4,800	5,100
Total Subsistence					*29,650*	*31,700*	*34,000*	*36,400*	*38,900*
Collaborative projects									
Within Tanzania		8,000,000	TSh/annum		8,000	8,600	9,200	9,800	10,500
With ARIs/regional links		195,000,000	TSh/annum		195,000	208,700	223,300		
Total Collaborative projects					*203,000*	*217,300*	*232,500*	*9,800*	*10,500*

Technology Transfer & Training Unit Summary

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		68,900	73,500	78,200	83,300	88,700
Office costs		20,400	21,900	23,400	24,900	26,700
Repairs and Maintenance		1,400	1,600	1,600	1,600	1,600
Publications and dissemination		70,800	75,800	80,900	86,400	92,300
Multiplication of varieties		81,400	50,600	50,000	53,500	57,300
Vehicle running costs		25,200	27,300	29,400	31,600	33,800
Subsistence		24,150	25,800	27,900	30,000	32,100
Collaborative projects		67,000	71,500	76,200	13,400	14,400
Contingency - 5%		18,000	17,300	18,400	16,200	17,400
Total		377,250	365,300	386,000	340,900	364,300

Notes: This breakdown allows totals for individual items of research expenditure to be viewed.

Technology Transfer & Training Unit Summary

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				52,400	56,100	60,000	64,200	68,700
Pension and retirement benefits				4,800	5,100	5,500	5,900	6,300
Gratuity				9,800	10,500	11,200	12,000	12,800
Allowances				1,900	2,000	2,100	2,200	2,400
Total staffing				*68,900*	*73,700*	*78,800*	*84,300*	*90,200*
Office costs								
Communications		400,000	TSh/month	4,800	5,140	5,500	5,890	6,300
Printing & Stationery		450,000	TSh/month	5,400	5,780	6,180	6,610	7,070
General office expenses		850,000	TSh/month	10,200	10,910	11,670	12,490	13,360
Total Office costs				20,400	21,830	23,350	24,990	26,730
Repairs and Maintenance								
Laboratory equipment		800,000	TSh/annum	800	860	920	980	1,050
Experimental equipment		600,000	TSh/annum	600	640	680	730	780
Total Repairs and Maintenance				*1,400*	*1,500*	*1,600*	*1,710*	*1,830*
Experimental and Lab costs								
Lab consumables		450,000	TSh/month	5,400	5,780	6,180	6,610	7,070
Chemicals and reagents		500,000	TSh/month	6,000	6,420	6,870	7,350	7,860
Field consumables		450,000	TSh/month	5,400	5,780	6,180	6,610	7,070
Casual Labour (mandays/month)		1,540,000	TSh/month	18,480	19,770	21,150	22,630	24,210
Total Experimental and Lab				*16,800*	*17,980*	*19,230*	*20,570*	*22,000*
Vehicle Runnning Costs								
Fuel & lubricants		60,000	km/year	6,000	6,420	6,870	7,350	7,860
Maintenance				1,200	1,280	1,370	1,470	1,570
Insurance & tax				1,200	1,280	1,370	1,470	1,570
Total Vehicle running costs				*8,400*	*8,980*	*9,610*	*10,290*	*11,000*

Technology Transfer & Training Unit Summary

Detailed Budget (Tsh '000) continued

Item	Note				2003/4	2004/5	2005/6	2006/7	2007/8
Publications and dissemination									
Training events and workshops		60,000,000	TSh/annum		60,000	64,200	68,700	73,500	78,600
Dissemination materials		700,000	TSh/month		8,400	9,000	9,600	10,300	11,000
Field consumables		200,000	TSh/month		2,400	2,600	2,800	3,000	3,200
Casual Labour (Mandays/month)	-	-	TSh/month		-	-	-	-	-
Total Publications and Dissemination					*70,800*	*75,800*	*81,100*	*86,800*	*92,800*
Subsistence		Amount	Unit	Unit cost (TSh)					
Visitors expenses		140	days	60,000	8,400	9,000	9,600	10,300	11,000
TaCRI staff T&S expenses									
- Head of Department		150	days	45,000	6,750	7,200	7,700	8,200	8,800
- Research Officer		90	days	40,000	3,600	3,900	4,200	4,500	4,800
- Field Officers		-	days	35,000	-	-	-	-	-
- Driver		-	days	30,000	-	-	-	-	-
Total Subsistence					*18,750*	*20,100*	*21,500*	*23,000*	*24,600*
Collaborative projects									
Within Tanzania		11,000,000	TSh/annum		11,000	11,800	12,600	13,500	14,400
With ARIs/regional links		50,000,000	TSh/annum		50,000	53,500	57,200		
Total Collaborative projects					*61,000*	*65,300*	*69,800*	*13,500*	*14,400*

Tanzania Coffee Research Institute
Management Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Chief Executive Director		68,656	47,800	51,000	54,400	58,000
Accounts		51,263	54,100	47,000	50,100	53,500
Site management		75,310	80,900	86,700	92,800	99,200
TaCRI Board		6,154	6,700	7,100	7,500	7,900
Technical Advisory Panel		7,890	8,400	9,000	9,700	10,400
Training		20,000	71,400	52,900	56,600	110,500
Contingency		10,500	9,900	10,000	10,700	11,500
Total Management		239,773	279,200	263,700	281,800	351,000

Management Budget (TSh '000): Details

	2003/4	2004/5	2005/6	2006/7	2007/8
Chief Executive Director					
Salary	18,000	19,300	20,700	22,100	23,600
NSSF	1,800	1,900	2,000	2,100	2,200
Gratuity	3,600	3,900	4,200	4,500	4,800
Allowances	600	600	600	600	600
Travel & subsistence					
- Meetings in Moshi	200	200	200	200	200
- Meetings in Dar	750	800	900	1,000	1,100
- International meetings	3,300	3,500	3,700	4,000	4,300
Air travel	3,040	3,300	3,500	3,700	4,000
Vehicle	8,200	8,800	9,400	10,100	10,800
Support staff					
- Salary	2,820	3,000	3,200	3,400	3,600
- NSSF	282	300	300	300	300
- Gratuity	564	600	600	600	600
Staff Welfare Funds	1,500	1,600	1,700	1,800	1,900
Redeployment funds	24,000				
Total Chief Executive Director	*68,656*	*47,800*	*51,000*	*54,400*	*58,000*

Management Budget (TSh '000): Details continued

Item	2003/4	2004/5	2005/6	2006/7	2007/8
Accounts					
Staffing					
Salaries	10,818	11,600	12,400	13,300	14,200
NSSF	1,082	1,200	1,300	1,400	1,500
Gratuity	2,164	2,300	2,500	2,700	2,900
Allowances	-	-	-	-	-
Medical costs (all TaCRI staff)	4,400	4,700	5,000	5,400	5,800
Communication					
Telephone	4,200	4,500	4,800	5,100	5,500
Internet	1,200	1,300	1,400	1,500	1,600
Postage	600	600	600	600	600
Web site	10,000	10,000			
Office costs					
Electricity	2,400	2,600	2,800	3,000	3,200
Fuel for generator	1,800	1,900	2,000	2,100	2,200
Consumables	1,800	1,900	2,000	2,100	2,200
Travel & subsistence					
Vehicle	1,500	1,600	1,700	1,800	1,900
T&S	1,800	1,900	2,000	2,100	2,200
Miscellaneous					
Bank Charges	1,500	1,600	1,700	1,800	1,900
Auditors Fees	3,000	3,200	3,400	3,600	3,900
Legal Fees	3,000	3,200	3,400	3,600	3,900
Total Accounts	*51,263*	*54,100*	*47,000*	*50,100*	*53,500*

Management Budget (TSh '000): Details continued

Item	2003/4	2004/5	2005/6	2006/7	2007/8
Site Management					
Staff					
Salaries	29,970	32,100	34,300	36,700	39,300
NSSF	1,760	1,900	2,000	2,100	2,200
Gratuity	3,520	3,800	4,100	4,400	4,700
Allowances	660	700	700	700	700
Vehicles					
- Tractor	1,500	1,600	1,700	1,800	1,900
- Vineyard tractor	1,000	1,100	1,200	1,300	1,400
- Pickup	1,000	1,100	1,200	1,300	1,400
- contracted lorry transport	4,000	4,300	4,600	4,900	5,200
Estate					
Maintenance of equipment	1,000	1,100	1,200	1,300	1,400
Maintenance of buildings	5,000	5,400	5,800	6,200	6,600
Fuel and consumables	1,000	1,100	1,200	1,300	1,400
Labour	3,360	3,600	3,900	4,200	4,500
Bulk coffee areas (15 ha)					
Agronomic inputs	7,500	8,000	8,600	9,200	9,800
Labour	10,080	10,800	11,600	12,400	13,300
Coffee Factory					
Maintenance	1,000	1,100	1,200	1,300	1,400
Consumables	1,000	1,100	1,200	1,300	1,400
Labour	1,960	2,100	2,200	2,400	2,600
Total Site Management	*75,310*	*80,900*	*86,700*	*92,800*	*99,200*

Management Budget (TSh '000): Details continued

Item	2003/4	2004/5	2005/6	2006/7	2007/8
TaCRI Board					
TaCRI Board meeting allowances	1,640	1,800	1,900	2,000	2,100
TaCRI Board subsistence	1,640	1,800	1,900	2,000	2,100
TaCRI Board travel expenses	2,810	3,000	3,200	3,400	3,600
Miscellaneous meeting expenses	64	100	100	100	100
Total TaCRI Board	*6,154*	*6,700*	*7,100*	*7,500*	*7,900*
Technical Advisory Panel					
TAP meeting allowances	1,040	1,100	1,200	1,300	1,400
TAP T&S expenses	1,040	1,100	1,200	1,300	1,400
TAP travel expenses	5,770	6,200	6,600	7,100	7,600
Miscellaneous meeting expenses	40	-	-	-	-
Total TAP	*7,890*	*8,400*	*9,000*	*9,700*	*10,400*
Miscellaneous					
Reviews of SAP implementation		50,000			50,000
Training					
Short course training	20,000	21,400	22,900	24,500	26,200
Long course training			30,000	32,100	34,300
Training total	*20,000*	*71,400*	*52,900*	*56,600*	*110,500*

Tanzania Coffee Research Institute
Supporting data
Miscellaneous

Exchange rates		**Miscellaneous adjustments**	
TSh/$	1,000		
TSh/€	980	Robusta production correction	65%
€/$	0.98	Endowment return correction	70%
Inflation	7% /annum		
Cess	1.20%		
Contingency	5%	**EU STABEX funds**	€ 9,000,000
Gratuity/PRP	20%		
NSSF	10%		

Meetings and Subsistance Allowances

TaCRI Board			**Technical Advisory Panel**		
Number of meetings	4	/annum	Number of meetings	4	/annum
Number of members	7	excluding Chairman	Number of members	4	excluding Chairman
Sitting allowance			*Sitting allowance*		
- Chairman	60,000	TSh/meeting	- Chairman	60,000	TSh/meeting
- Board members	50,000	TSh/meeting	- Board members	50,000	TSh/meeting
- Management member	40,000	TSh/meeting	- Management memb	40,000	TSh/meeting
Subsistence allowance			*Subsistence allowance*		
- Chairman	60,000	TSh/day	- Chairman	60,000	TSh/day
- Board members	50,000	TSh/day	- Board members	50,000	TSh/day

Meeting expenses		
Meal	5,000	TSh/participant
Papers	3,000	TSh/participant

Subsistence allowance		
- CED	50000	TSh/day
- Head of Department	45000	TSh/day
- RO	40000	TSh/day
- FO	35000	TSh/day
- Driver	30000	TSh/day
International subsistence	220	US$/day

Transport & Travel

Airfares	TSh return
Dar-Moshi	180,000
Bukoba-Moshi	240,000
KIA-Europe	1,200,000
KIA-Africa	1,000,000

Bus fares	TSh return	
Mbeya-Moshi	40,000	By bus
Arusha_Moshi	62,000	By bus
Mufindi_Moshi	800,000	By car
Morogoro_Moshi	400,000	By car

Vehicles

Mileage rate	400	TSh/km	Lorry Hire	80,000	TSh/trip
Diesel	600	TSh/l	Lorry trips	50	trips

Vehicle	Distance (km/annum)	Fuel (l/km)	Fuel (TSh)	Maintenance rate (% of fuel cost)	Insurance (TSh/km)	Maintenance (TSh/annum)	Insurance (TSh/annum)	Total (TSh/annum)
Discovery	60,000	6	6,000,000	20%	20	1,200,000	1,000,000	8,200,000
Defender 110	50,000	6	5,000,000	20%	20	1,000,000	1,000,000	7,000,000
Defender PU	30,000	6	3,000,000	20%	30	600,000	1,000,000	4,600,000
Mitsubishi DC	50,000	8	3,750,000	20%	20	750,000	1,000,000	5,500,000

Department	Distance (km)
CED	60,000
Accounts	20,000
Site Management	20,000
Crop Improvement	30,000
Crop Productivity	30,000
Crop Nutrition	30,000
Livelihoods & Income Security	50,000
TTTU (Maruku)	40,000
TTTU (Ugano)	40,000
TTTU (Mbimba)	40,000
TTTU	60,000
Total TaCRI	*420,000*

Vehicle cost	Indicative Cost (TSh)	Current mileage (km)	Replacement (km)	Predicted mileage (km/annum)	Time to first replacement (Years)	Normal replacement cycle (years)
Discovery	40,000,000	4,000	300,000	75,000	4	4
Defender	30,000,000	168,000	250,000	50,000	2	5
Doublecab	30,000,000	64,000	200,000	40,000	3	5
Pickup	25,000,000	60,000	200,000	40,000	4	5
Tractor	35,000,000				5	5
Vineyard tractor	25,000,000				5	5
Motorcycle	4,000,000		100,000	30,000	3	3

Information technology

Computers		
Desktop	1,500,000	TSh
Notebook	1,800,000	TSh
Printers		
Inkjet	400,000	TSh
Laserjet	1,500,000	TSh
Central Laser	4,500,000	TSh
Networking		
Network cards	500,000	TSh
Server	2,000,000	TSh
Wireless network hub	2,000,000	TSh
Service contract	2,000,000	TSh/annum

Library	TSh/annum
Journals	1,000,000
Books	1,000,000
Subscriptions	1,000,000

Audiovisual equipment	TSh
PowerPoint Projector	6,000,000
Overhead Projector	750,000
Screen	500,000
VCR	500,000
Portable generator	3,000,000
Digital video camera	1,500,000
Digital camera	750,000
Video editing computer	4,500,000
A0 laminating machine	2,000,000
A0 printer	7,500,000
Total Audiovisual Equipment	

Lab and Office costs and prices

Prices

Plant material	Value	Unit
Plant	0.10	€/plant
Analysis		
Estate	13,000	TSh/sample
Proportion of samples	25%	
Smallholder	5,000	TSh/sample
Proportion of samples	75%	

Costs

Office costs	TSh/month
Internet	100,000
Telephone	350,000
Postage	50,000
Consumables	150,000
Generator	150,000
Electricity	200,000

Lease rate	135	€/ha

Station details

Coffee area	42	ha
Coffee expts	27	ha
Bulk coffee	15	ha
Multiplication area	1	ha

Agrochem	500,000	TSh/ha	Incl Fertiliser, herbicides etc
Coffee labour	40	mandays/ha/month	
Factory labour	1,400	mandays/annum	
Factory maintenance	1,000,000	TSh/annum	
Factory consumables	1,000,000	TSh/annum	
Site maintenance	200	Mandays/month	
Casual Labour	1,400	TSh/day	

Charges	TSh/annum
Bank Charges	1,500,000
Legal fees	3,000,000
Auditors fees	3,000,000

Personnel	TSh/person	Number	Total (TSh)
Redeployment	1,500,000	16	24,000,000
Medical	100,000	44	4,400,000

(TSh '000)	2003/4	2004/5	2005/6	2006/7	2007/8
Contingency	118,800	60,400	37,200	29,300	28,900
Staffing	129,700	138,700	148,200	158,400	169,100
% of total spend	4%	8%	12%	15%	15%

Maintenance costs	TSh/annum
Building maintenance	5,000,000
Equipment maintenance	1,000,000
Maintenance fuel	1,000,000

Fuel for Site Management	TSh/annum
Tractor fuel	1,500,000
Vineyard tractor fuel	1,000,000
Pickup fuel	1,000,000

Tanzania Coffee Research Institute
Crop Improvement Department
Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		23,600	25,200	27,000	28,900	30,900
Office costs		1,440	1,540	1,640	1,760	1,880
Repairs and Maintenance		650	700	750	800	850
Experimental and Lab Costs		6,600	7,070	7,570	8,090	8,660
Vehicle Runnning Costs		4,200	4,490	4,790	5,130	5,490
Subsistence		9,850	10,500	11,200	12,000	12,900
Collaborative projects	1	77,000	82,400	88,100	2,400	2,600
Contingency - 5%		6,200	6,600	7,100	3,000	3,200
Total Expenditure		129,540	138,500	148,150	62,080	66,480

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				17,400	18,600	19,900	21,300	22,800
Pension and retirement benefits				1,700	1,800	1,900	2,000	2,100
Gratuity				3,500	3,700	4,000	4,300	4,600
Allowances				1,000	1,100	1,200	1,300	1,400
Total staffing				*23,600*	*25,200*	*27,000*	*28,900*	*30,900*
Office costs								
Communications		50,000	TSh/month	600	640	680	730	780
Printing & stationery		50,000	TSh/month	600	640	680	730	780
General office expenses		20,000	TSh/month	240	260	280	300	320
Total Office costs				1,440	1,540	1,640	1,760	1,880
Repairs and Maintenance								
Laboratory equipment		500,000	TSh/annum	500	540	580	620	660
Experimental equipment		150,000	TSh/annum	150	160	170	180	190
Total Repairs and Maintenance				*650*	*700*	*750*	*800*	*850*
Experimental and Lab costs								
Lab consumables		200,000	TSh/month	2,400	2,570	2,750	2,940	3,150
Chemicals and reagents		200,000	TSh/month	2,400	2,570	2,750	2,940	3,150
Field consumables		150,000	TSh/month	1,800	1,930	2,070	2,210	2,360
Casual Labour (mandays/month)	750	1,050,000	TSh/month	12,600	13,480	14,420	15,430	16,510
Total Experimental and Lab				6,600	7,070	7,570	8,090	8,660
Vehicle Runnning Costs								
Fuel & lubricants		30,000	km/year	3,000	3,210	3,430	3,670	3,930
Maintenance				600	640	680	730	780
Insurance & tax				600	640	680	730	780
Total Vehicle running costs				4,200	4,490	4,790	5,130	5,490

Detailed Budget (Tsh '000) continued

Item	Note	Amount	Unit	Unit cost (TSh)	2003/4	2004/5	2005/6	2006/7	2007/8
Subsistence									
Visitors expenses		50	days	60,000	3,000	3,200	3,400	3,600	3,900
TaCRI staff T&S expenses									
- Head of Department		50	days	45,000	2,250	2,400	2,600	2,800	3,000
- Research Officer		50	days	40,000	2,000	2,100	2,200	2,400	2,600
- Field Officers		40	days	35,000	1,400	1,500	1,600	1,700	1,800
- Driver		40	days	30,000	1,200	1,300	1,400	1,500	1,600
Total Subsistence					*9,850*	*10,500*	*11,200*	*12,000*	*12,900*
Collaborative projects									
Within Tanzania		2,000,000	TSh/annum		2,000	2,100	2,200	2,400	2,600
With ARIs/regional links		75,000,000	TSh/annum		75,000	80,300	85,900		
Total Collaborative projects					*77,000*	*82,400*	*88,100*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Crop Productivity and Primary Processing Department

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		24,800	26,600	28,500	30,500	32,600
Office costs		1,440	1,540	1,640	1,760	1,880
Repairs and Maintenance		650	700	750	800	850
Experimental and Lab Costs		1,800	1,920	2,040	2,190	2,340
Vehicle Runnning Costs		4,200	4,490	4,790	5,130	5,490
Subsistence		6,950	7,500	8,100	8,700	9,300
Collaborative projects	1	52,000	55,600	59,400	2,400	2,600
Contingency - 5%		4,600	4,900	5,300	2,600	2,800
Total Expenditure		96,440	103,250	110,520	54,080	57,860

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				18,300	19,600	21,000	22,500	24,100
Pension and retirement benefits				1,800	1,900	2,000	2,100	2,200
Gratuity				3,700	4,000	4,300	4,600	4,900
Allowances				1,000	1,100	1,200	1,300	1,400
Total staffing				*24,800*	*26,600*	*28,500*	*30,500*	*32,600*
Office costs								
Communications		50,000	TSh/month	600	640	680	730	780
Printing & stationery		50,000	TSh/month	600	640	680	730	780
General office expenses		20,000	TSh/month	240	260	280	300	320
Total Office costs				1,440	1,540	1,640	1,760	1,880
Repairs and Maintenance								
Laboratory equipment		500,000	TSh/annum	500	540	580	620	660
Experimental equipment		150,000	TSh/annum	150	160	170	180	190
Total Repairs and Maintenance				*650*	*700*	*750*	*800*	*850*
Experimental and Lab costs								
Lab consumables		50,000	TSh/month	600	640	680	730	780
Chemicals and reagents		50,000	TSh/month	600	640	680	730	780
Field consumables		50,000	TSh/month	600	640	680	730	780
Casual Labour (mandays/month)	150	210,000	TSh/month	2,520	2,700	2,890	3,090	3,310
Total Experimental and Lab				1,800	1,920	2,040	2,190	2,340
Vehicle Runnning Costs								
Fuel & lubricants		30,000	km/year	3,000	3,210	3,430	3,670	3,930
Maintenance				600	640	680	730	780
Insurance & tax				600	640	680	730	780
Total Vehicle running costs				4,200	4,490	4,790	5,130	5,490

Detailed Budget (Tsh '000) continued

Item	Note	Amount	Unit	Unit cost (TSh)	2003/4	2004/5	2005/6	2006/7	2007/8
Subsistence									
Visitors expenses		20	days	60,000	1,200	1,300	1,400	1,500	1,600
TaCRI staff T&S expenses									
- Head of Department		50	days	45,000	2,250	2,400	2,600	2,800	3,000
- Research Officer		30	days	40,000	1,200	1,300	1,400	1,500	1,600
- Field Officers		40	days	35,000	1,400	1,500	1,600	1,700	1,800
- Driver		30	days	30,000	900	1,000	1,100	1,200	1,300
Total Subsistence					*6,950*	*7,500*	*8,100*	*8,700*	*9,300*
Collaborative projects									
Within Tanzania		2,000,000	TSh/annum		2,000	2,100	2,200	2,400	2,600
With ARIs/regional links		50,000,000	TSh/annum		50,000	53,500	57,200		
Total Collaborative projects					*52,000*	*55,600*	*59,400*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Crop Nutrition Department

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		26,800	28,600	30,500	32,600	34,900
Office costs		1,440	1,540	1,640	1,760	1,880
Repairs and Maintenance		3,500	3,750	4,010	4,290	4,590
Experimental and Lab Costs		7,800	8,350	12,360	13,220	14,150
Vehicle Runnning Costs		4,200	4,490	4,790	5,130	5,490
Subsistence		7,300	7,800	8,400	9,000	9,600
Collaborative projects	1	52,000	55,600	59,400	2,400	2,600
Contingency - 5%		5,200	5,500	6,100	3,400	3,700
Total Expenditure		108,240	115,630	127,200	71,800	76,910

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				20,300	21,700	23,200	24,800	26,500
Pension and retirement benefits				2,000	2,100	2,200	2,400	2,600
Gratuity				4,100	4,400	4,700	5,000	5,400
Allowances				400	400	400	400	400
Total staffing				*26,800*	*28,600*	*30,500*	*32,600*	*34,900*
Office costs								
Communications		50,000	TSh/month	600	640	680	730	780
Printing & stationery		50,000	TSh/month	600	640	680	730	780
General office expenses		20,000	TSh/month	240	260	280	300	320
Total Office costs				1,440	1,540	1,640	1,760	1,880
Repairs and Maintenance								
Laboratory equipment		3,000,000	TSh/annum	3,000	3,210	3,430	3,670	3,930
Experimental equipment		500,000	TSh/annum	500	540	580	620	660
Total Repairs and Maintenance				*3,500*	*3,750*	*4,010*	*4,290*	*4,590*
Experimental and Lab costs								
Lab consumables + glassware		200,000	TSh/month	2,400	2,570	2,750	2,940	3,150
Chemicals and reagents		250,000	TSh/month	3,000	3,210	6,860	7,340	7,850
Field consumables		200,000	TSh/month	2,400	2,570	2,750	2,940	3,150
Casual Labour (mandays/month)	200	280,000	TSh/month	3,360	3,600	3,850	4,120	4,410
Total Experimental and Lab				7,800	8,350	12,360	13,220	14,150
Vehicle Runnning Costs								
Fuel & lubricants		30,000	km/year	3,000	3,210	3,430	3,670	3,930
Maintenance				600	640	680	730	780
Insurance & tax				600	640	680	730	780
Total Vehicle running costs				4,200	4,490	4,790	5,130	5,490

Detailed Budget (Tsh '000) continued

Item	Note	Amount	Unit	Unit cost (TSh)	2003/4	2004/5	2005/6	2006/7	2007/8
Subsistence									
Visitors expenses		20	days	60,000	1,200	1,300	1,400	1,500	1,600
TaCRI staff T&S expenses									
- Head of Department		60	days	45,000	2,700	2,900	3,100	3,300	3,500
- Research Officer		10	days	40,000	400	400	400	400	400
- Field Officers		60	days	35,000	2,100	2,200	2,400	2,600	2,800
- Driver		30	days	30,000	900	1,000	1,100	1,200	1,300
Total Subsistence					*7,300*	*7,800*	*8,400*	*9,000*	*9,600*
Collaborative projects									
Within Tanzania		2,000,000	TSh/annum		2,000	2,100	2,200	2,400	2,600
With ARIs/regional links		50,000,000	TSh/annum		50,000	53,500	57,200		
Total Collaborative projects					*52,000*	*55,600*	*59,400*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Livelihoods and Income Security

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		8,400	8,900	9,400	10,000	10,600
Office costs		2,700	2,900	3,100	3,300	3,500
Repairs and Maintenance		200	200	200	200	200
Experimental and Lab Costs		600	600	600	600	600
Vehicle Runnning Costs		7,000	7,600	8,200	8,800	9,400
Subsistence		5,550	6,000	6,500	7,000	7,500
Collaborative projects	1	22,000	23,500	25,100	2,400	2,600
Contingency - 5%		2,300	2,500	2,700	1,600	1,700
Total Expenditure		48,750	52,200	55,800	33,900	36,100

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				5,900	6,300	6,700	7,200	7,700
Pension and retirement benefits				600	600	600	600	600
Gratuity				1,200	1,300	1,400	1,500	1,600
Allowances				700	700	700	700	700
Total staffing				*8,400*	*8,900*	*9,400*	*10,000*	*10,600*
Office costs								
Communications		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Printing & stationery		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
General office expenses		25,000	TSh/month	300	300	300	300	300
Total Office costs				2,700	2,900	3,100	3,300	3,500
Repairs and Maintenance								
Office equipment		200,000	TSh/annum	200	200	200	200	200
Experimental equipment		-	TSh/annum	-	-	-	-	-
Total Repairs and Maintenance				*200*	*200*	*200*	*200*	*200*
Experimental and Lab costs								
Lab consumables		-	TSh/month	-	-	-	-	-
Chemicals and reagents		-	TSh/month	-	-	-	-	-
Field consumables		50,000	TSh/month	600	600	600	600	600
Casual Labour (mandays/month)			TSh/month	-	-	-	-	-
Total Experimental and Lab				600	600	600	600	600
Vehicle Runnning Costs								
Fuel & lubricants		50,000	km/year	5,000	5,400	5,800	6,200	6,600
Maintenance				1,000	1,100	1,200	1,300	1,400
Insurance & tax				1,000	1,100	1,200	1,300	1,400
Total Vehicle running costs				7,000	7,600	8,200	8,800	9,400

Detailed Budget (Tsh '000) continued

Item	Note	Amount	Unit	Unit cost (TSh)	2003/4	2004/5	2005/6	2006/7	2007/8
Subsistence									
Visitors expenses		20	days	60,000	1,200	1,300	1,400	1,500	1,600
TaCRI staff T&S expenses									
- Head of Department		50	days	45,000	2,250	2,400	2,600	2,800	3,000
- Research Officer		30	days	40,000	1,200	1,300	1,400	1,500	1,600
- Field Officers		-	days	35,000	-	-	-	-	-
- Driver		30	days	30,000	900	1,000	1,100	1,200	1,300
Total Subsistence					*5,550*	*6,000*	*6,500*	*7,000*	*7,500*
Collaborative projects									
Within Tanzania		2,000,000	TSh/annum		2,000	2,100	2,200	2,400	2,600
With ARIs/regional links		20,000,000	TSh/annum		20,000	21,400	22,900		
Total Collaborative projects					*22,000*	*23,500*	*25,100*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Maruku Coffee Research Sub-Station

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		11,300	12,000	12,700	13,500	14,300
Office costs		5,400	5,800	6,200	6,600	7,100
Repairs and Maintenance		250	300	300	300	300
Publications and dissemination		16,800	18,000	19,200	20,500	21,900
Multiplication of varieties		14,180	12,500	13,300	14,200	15,200
Vehicle running costs\		5,600	6,100	6,600	7,100	7,600
Subsistence		4,500	4,800	5,200	5,600	6,000
Collaborative projects	1	4,000	4,200	4,400	2,400	2,600
Contingency - 5%		3,100	3,200	3,400	3,500	3,800
Total		65,130	66,900	71,300	73,700	78,800

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				8,600	9,200	9,800	10,500	11,200
Pension and retirement benefits				700	700	700	700	700
Gratuity				1,500	1,600	1,700	1,800	1,900
Allowances				500	500	500	500	500
Total staffing				*11,300*	*12,000*	*12,700*	*13,500*	*14,300*
Office costs								
Communications		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Printing & stationery		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Office expenses		250,000	TSh/month	3,000	3,200	3,400	3,600	3,900
Total Office costs				*5,400*	*5,800*	*6,200*	*6,600*	*7,100*
Repairs and Maintenance								
Audiovisual equipment		100,000	TSh/annum	100	100	100	100	100
Experimental equipment		150,000	TSh/annum	150	200	200	200	200
Total Repairs and Maintenance				*250*	*300*	*300*	*300*	*300*
Publications and dissemination								
Training events and workshops		15,000,000	TSh/annum	15,000	16,100	17,200	18,400	19,700
Dissemination materials		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Field consumables		50,000	TSh/month	600	600	600	600	600
Total Publications and Dissemination				*16,800*	*18,000*	*19,200*	*20,500*	*21,900*
Multiplication of varieties								
Maintenance/expansion of clonal plots				-	-	-	-	-
Establish VPU				-	-	-	-	-
Consumables		8,000,000	TSh/annum	8,000	8,600	9,200	9,800	10,500
Ancillary works			TSh/annum	-	-	-	-	-
Zonal nurseries	1	2,500,000	TSh	2,500	-	-	-	-
Registration, inspection, training		2,000,000	TSh/annum	2,000	2,100	2,200	2,400	2,600
Casual Labour (Mandays/month)	100	140,000	TSh/month	1,680	1,800	1,900	2,000	2,100
Total Multiplication of varieties				*14,180*	*12,500*	*13,300*	*14,200*	*15,200*

Detailed Budget (Tsh '000) continued

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Vehicle Runnning Costs								
Fuel & lubricants		40,000	km/year	4,000	4,300	4,600	4,900	5,200
Maintenance				800	900	1,000	1,100	1,200
Insurance & tax				800	900	1,000	1,100	1,200
Total Vehicle running costs				*5,600*	*6,100*	*6,600*	*7,100*	*7,600*

Subsistence	Amount	Unit	Unit cost (TSh)					
Visitors expenses	5	days	60,000	300	300	300	300	300
TaCRI staff T&S expenses								
- Head of Department	-	days	45,000	-	-	-	-	-
- Research Officer	30	days	40,000	1,200	1,300	1,400	1,500	1,600
- Field Officers	60	days	35,000	2,100	2,200	2,400	2,600	2,800
- Driver	30	days	30,000	900	1,000	1,100	1,200	1,300
Total Subsistence				*4,500*	*4,800*	*5,200*	*5,600*	*6,000*

Collaborative projects								
Within Tanzania		2,000,000	TSh/annum	2,000	2,100	2,200	2,400	2,600
With ARIs/regional links		2,000,000	TSh/annum	2,000	2,100	2,200		
Total Collaborative projects				*4,000*	*4,200*	*4,400*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Ugano Coffee Research Sub-Station

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		11,300	12,000	12,700	13,500	14,300
Office costs		5,400	5,800	6,200	6,600	7,100
Repairs and Maintenance		250	300	300	300	300
Publications and dissemination		16,800	18,000	19,200	20,500	21,900
Multiplication of varieties		7,840	3,500	3,700	4,000	4,300
Vehicle running costs\		5,600	6,100	6,600	7,100	7,600
Subsistence		4,500	4,800	5,200	5,600	6,000
Collaborative projects	1	4,000	4,200	4,400	2,400	2,600
Contingency - 5%		2,800	2,700	2,900	3,000	3,200
Total		58,490	57,400	61,200	63,000	67,300

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				8,600	9,200	9,800	10,500	11,200
Pension and retirement benefits				700	700	700	700	700
Gratuity				1,500	1,600	1,700	1,800	1,900
Allowances				500	500	500	500	500
Total staffing				*11,300*	*12,000*	*12,700*	*13,500*	*14,300*
Office costs								
Communications		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Printing & stationery		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Office expenses (incl. fuel for generator at Ugan		250,000	TSh/month	3,000	3,200	3,400	3,600	3,900
Total Office costs				*5,400*	*5,800*	*6,200*	*6,600*	*7,100*
Repairs and Maintenance								
Audiovisual equipment		100,000	TSh/annum	100	100	100	100	100
Experimental equipment		150,000	TSh/annum	150	200	200	200	200
Total Repairs and Maintenance				*250*	*300*	*300*	*300*	*300*
Publications and dissemination								
Training events and workshops		15,000,000	TSh/annum	15,000	16,100	17,200	18,400	19,700
Dissemination materials		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Field consumables		50,000	TSh/month	600	600	600	600	600
Total Publications and Dissemination				*16,800*	*18,000*	*19,200*	*20,500*	*21,900*
Multiplication of varieties								
Maintenance/expansion of clonal plots				-	-	-	-	-
Establish VPU				-	-	-	-	-
Consumables		500,000	TSh/annum	500	500	500	500	500
Ancillary works		2000000	TSh/annum	2,000	-	-	-	-
Zonal nurseries	1	2,500,000	TSh	2,500	-	-	-	-
Registration, inspection, training		2,000,000	TSh/annum	2,000	2,100	2,200	2,400	2,600
Casual Labour (Mandays/month)	50	70,000	TSh/month	840	900	1,000	1,100	1,200
Total Multiplication of varieties				*7,840*	*3,500*	*3,700*	*4,000*	*4,300*

Detailed Budget (Tsh '000) continued

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Vehicle Runnning Costs								
Fuel & lubricants		40,000	km/year	4,000	4,300	4,600	4,900	5,200
Maintenance				800	900	1,000	1,100	1,200
Insurance & tax				800	900	1,000	1,100	1,200
Total Vehicle running costs				*5,600*	*6,100*	*6,600*	*7,100*	*7,600*

Subsistence	Amount	Unit	Unit cost (TSh)					
Visitors expenses	5	days	60,000	300	300	300	300	300
TaCRI staff T&S expenses								
- Head of Department	-	days	45,000	-	-	-	-	-
- Research Officer	30	days	40,000	1,200	1,300	1,400	1,500	1,600
- Field Officers	60	days	35,000	2,100	2,200	2,400	2,600	2,800
- Driver	30	days	30,000	900	1,000	1,100	1,200	1,300
Total Subsistence				*4,500*	*4,800*	*5,200*	*5,600*	*6,000*
Collaborative projects								
Within Tanzania	2,000,000	TSh/annum		2,000	2,100	2,200	2,400	2,600
With ARIs/regional links	2,000,000	TSh/annum		2,000	2,100	2,200		
Total Collaborative projects				*4,000*	*4,200*	*4,400*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Mbimba Coffee Research Sub-Station

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		11,300	12,000	12,700	13,500	14,300
Office costs		5,400	5,800	6,200	6,600	7,100
Repairs and Maintenance		250	300	300	300	300
Publications and dissemination		16,800	18,000	19,200	20,500	21,900
Multiplication of varieties		7,840	3,500	3,700	4,000	4,300
Vehicle running costs\		5,600	6,100	6,600	7,100	7,600
Subsistence		4,500	4,800	5,200	5,600	6,000
Collaborative projects	1	4,000	4,200	4,400	2,400	2,600
Contingency - 5%		2,800	2,700	2,900	3,000	3,200
Total		58,490	57,400	61,200	63,000	67,300

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				8,600	9,200	9,800	10,500	11,200
Pension and retirement benefits				700	700	700	700	700
Gratuity				1,500	1,600	1,700	1,800	1,900
Allowances				500	500	500	500	500
Total staffing				*11,300*	*12,000*	*12,700*	*13,500*	*14,300*
Office costs								
Communications		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Printing & stationery		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Office expenses (incl. fuel for generator at Ugan		250,000	TSh/month	3,000	3,200	3,400	3,600	3,900
Total Office costs				*5,400*	*5,800*	*6,200*	*6,600*	*7,100*
Repairs and Maintenance								
Audiovisual equipment		100,000	TSh/annum	100	100	100	100	100
Experimental equipment		150,000	TSh/annum	150	200	200	200	200
Total Repairs and Maintenance				*250*	*300*	*300*	*300*	*300*
Publications and dissemination								
Training events and workshops		15,000,000	TSh/annum	15,000	16,100	17,200	18,400	19,700
Dissemination materials		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Field consumables		50,000	TSh/month	600	600	600	600	600
Total Publications and Dissemination				*16,800*	*18,000*	*19,200*	*20,500*	*21,900*
Multiplication of varieties								
Maintenance/expansion of clonal plots		0		-	-	-	-	-
Establish VPU				-	-	-	-	-
Consumables		500,000	TSh/annum	500	500	500	500	500
Ancillary works		2000000	TSh/annum	2,000	-	-	-	-
Zonal nurseries	1	2,500,000	TSh	2,500	-	-	-	-
Registration, inspection, training		2,000,000	TSh/annum	2,000	2,100	2,200	2,400	2,600
Casual Labour (Mandays/month)	50	70,000	TSh/month	840	900	1,000	1,100	1,200
Total Multiplication of varieties				*7,840*	*3,500*	*3,700*	*4,000*	*4,300*

Detailed Budget (Tsh '000) continued

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Vehicle Runnning Costs								
Fuel & lubricants		40,000	km/year	4,000	4,300	4,600	4,900	5,200
Maintenance				800	900	1,000	1,100	1,200
Insurance & tax				800	900	1,000	1,100	1,200
Total Vehicle running costs				*5,600*	*6,100*	*6,600*	*7,100*	*7,600*
Subsistence	Amount	Unit	Unit cost (TSh)					
Visitors expenses	5	days	60,000	300	300	300	300	300
TaCRI staff T&S expenses								
- Head of Department	-	days	45,000	-	-	-	-	-
- Research Officer	30	days	40,000	1,200	1,300	1,400	1,500	1,600
- Field Officers	60	days	35,000	2,100	2,200	2,400	2,600	2,800
- Driver	30	days	30,000	900	1,000	1,100	1,200	1,300
Total Subsistence				*4,500*	*4,800*	*5,200*	*5,600*	*6,000*
Collaborative projects								
Within Tanzania	2,000,000	TSh/annum		2,000	2,100	2,200	2,400	2,600
With ARIs/regional links	2,000,000	TSh/annum		2,000	2,100	2,200		
Total Collaborative projects				*4,000*	*4,200*	*4,400*	*2,400*	*2,600*

Tanzania Coffee Research Institute

Technology Transfer and Training Unit (Lyamungu)

Annual Budget (TSh '000): 2003 - 2008

Item	Note	2003/4	2004/5	2005/6	2006/7	2007/8
Staffing		35,000	37,500	40,100	42,800	45,800
Office costs		4,200	4,500	4,800	5,100	5,400
Repairs and Maintenance		650	700	700	700	700
Publications and dissemination		20,400	21,800	23,300	24,900	26,600
Multiplication of varieties		51,540	31,100	29,300	31,300	33,500
Vehicle running costs		8,400	9,000	9,600	10,300	11,000
Subsistence		10,650	11,400	12,300	13,200	14,100
Collaborative projects	1	55,000	58,900	63,000	6,200	6,600
Contingency - 5%		9,300	8,700	9,200	6,700	7,200
Total		195,140	183,600	192,300	141,200	150,900

Notes: 1 Funds allocated for collaborative projects with other organisations.

Detailed Budget (TSh '000)

Item	Note			2003/4	2004/5	2005/6	2006/7	2007/8
Staffing								
Salaries				26,600	28,500	30,500	32,600	34,900
Pension and retirement benefits				2,700	2,900	3,100	3,300	3,500
Gratuity				5,300	5,700	6,100	6,500	7,000
Allowances				400	400	400	400	400
Total staffing				*35,000*	*37,500*	*40,100*	*42,800*	*45,800*
Office costs								
Communications		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Printing & stationery		150,000	TSh/month	1,800	1,900	2,000	2,100	2,200
Office expenses (incl. fuel for generator at Ugan		100,000	TSh/month	1,200	1,300	1,400	1,500	1,600
Total Office costs				*4,200*	*4,500*	*4,800*	*5,100*	*5,400*
Repairs and Maintenance								
Audiovisual equipment		500,000	TSh/annum	500	500	500	500	500
Experimental equipment		150,000	TSh/annum	150	200	200	200	200
Total Repairs and Maintenance				*650*	*700*	*700*	*700*	*700*
Publications and dissemination								
Training events and workshops		15,000,000	TSh/annum	15,000	16,100	17,200	18,400	19,700
Dissemination materials		400,000	TSh/month	4,800	5,100	5,500	5,900	6,300
Field consumables		50,000	TSh/month	600	600	600	600	600
Total Publications and Dissemination				*20,400*	*21,800*	*23,300*	*24,900*	*26,600*
Multiplication of varieties								
Maintenance/expansion of clonal plots		7,000,000	TSh/annum	7,000	7,500	4,000	4,300	4,600
Establish VPU		10,000,000	TSh	10,000	-	-	-	-
Consumables		8,000,000	TSh/annum	8,000	8,600	9,200	9,800	10,500
Ancillary works		10,000,000	TSh	10,000	-	-	-	-
Zonal nurseries	1	2,500,000	TSh	2,500	-	-	-	-
Registration, inspection, training		9,000,000	TSh/annum	9,000	9,600	10,300	11,000	11,800
Casual Labour (Mandays/month)	300	420,000	TSh/month	5,040	5,400	5,800	6,200	6,600
Total Multiplication of varieties				*51,540*	*31,100*	*29,300*	*31,300*	*33,500*
Vehicle Runnning Costs								
Fuel & lubricants		60,000	km/year	6,000	6,400	6,800	7,300	7,800
Maintenance				1,200	1,300	1,400	1,500	1,600
Insurance & tax				1,200	1,300	1,400	1,500	1,600
Total Vehicle running costs				*8,400*	*9,000*	*9,600*	*10,300*	*11,000*

Detailed Budget (Tsh '000) continued

Item	Note	Amount	Unit	Unit cost (TSh)	2003/4	2004/5	2005/6	2006/7	2007/8
Subsistence									
Visitors expenses		20	days	60,000	1,200	1,300	1,400	1,500	1,600
TaCRI staff T&S expenses									
- Head of Department		50	days	45,000	2,250	2,400	2,600	2,800	3,000
- Research Officer		60	days	40,000	2,400	2,600	2,800	3,000	3,200
- Field Officers		60	days	35,000	2,100	2,200	2,400	2,600	2,800
- Driver		90	days	30,000	2,700	2,900	3,100	3,300	3,500
Total Subsistence					*10,650*	*11,400*	*12,300*	*13,200*	*14,100*
Collaborative projects									
Within Tanzania		5,000,000	TSh/annum		5,000	5,400	5,800	6,200	6,600
With ARIs/regional links		50,000,000	TSh/annum		50,000	53,500	57,200		
Total Collaborative projects					*55,000*	*58,900*	*63,000*	*6,200*	*6,600*

Tanzania Coffee Research Institute
Staffing and staff costs

Department	Title	Grade	Point	Salary (TSh/annum)	NSSF (TSh/annum)	Gratuity/PRP (TSh/annum)	Allowances (TSh/annum)
Chief Executive Director	Chief Executive Director	TC12	1	18,000,000	1,800,000	3,600,000	600,000
	PA to CED	TC2	1	1,296,000	129,600	259,200	
	Librarian	TC2	3	1,524,000	152,400	304,800	
Total CED				*20,820,000*	*2,082,000*	*4,164,000*	*600,000*
Accounts	Accountant	TC8	3	8,520,000	852,000	1,704,000	
	Assistant Accountant	TC2	1	1,296,000	129,600	259,200	-
	Typist	TC1B	3	1,002,000	100,200	200,400	
Total Accounts				*10,818,000*	*1,081,800*	*2,163,600*	-
Lyamungu Site Management	Site Manager	TC5	4	4,620,000	462,000	924,000	660,000
	Clerk of Works	TC4	2	2,940,000	294,000	588,000	
	Store Assistant	TC2	1	1,296,000	129,600	259,200	
	Estate Attendant	TC1B	2	888,000	88,800	177,600	
	Workshop Attendant	TC1B	2	888,000	88,800	177,600	
	Driver	TC1B	3	1,002,000	100,200	200,400	
	Driver	TC1B	3	1,002,000	100,200	200,400	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
	Head Security Guard	TC1B	2	888,000	88,800	177,600	
	Security Guard	TC1B	1	774,000	77,400	154,800	
	Security Guard	TC1B	1	774,000	77,400	154,800	
	Security Guard	TC1B	1	774,000	77,400	154,800	
	Security Guard	21		12,348,000			
Total Site management				*29,970,000*	*1,762,200*	*3,524,400*	*660,000*
Crop improvement	Plant breeder	TC8	3	8,520,000	852,000	1,704,000	360,000
	Research Officer	TC4	2	2,940,000	294,000	588,000	660,000
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
Total Crop Improvement				*17,418,000*	*1,741,800*	*3,483,600*	*1,020,000*
Crop productivity	Head of Department	TC8	3	8,520,000	852,000	1,704,000	360,000
and primary processing	IPM specialist	TC4	2	2,940,000	294,000	588,000	660,000
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
Total CP&PP				*18,306,000*	*1,830,600*	*3,661,200*	*1,020,000*
Crop nutrition	Head of Department	TC8	3	8,520,000	852,000	1,704,000	360,000
	Laboratory Manager	TC4	2	2,940,000	294,000	588,000	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Senior Field Officer	TC3	3	1,986,000	198,600	397,200	
	Field Officer	TC3	3	1,986,000	198,600	397,200	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
Total Crop Nutrition				*20,292,000*	*2,029,200*	*4,058,400*	*360,000*
Livelihoods and	Economist	TC4	2	2,940,000	294,000	588,000	660,000
Income Security	Sociologist	TC4	2	2,940,000	294,000	588,000	
Total Livelihoods and Income Security				*5,880,000*	*588,000*	*1,176,000*	*660,000*

Tanzania Coffee Research Institute
Staffing and staff costs

Department	Title	Grade	Point	Salary (TSh/annum)	NSSF (TSh/annum)	Gratuity (TSh/annum)	Allowances (TSh/annum)
Technology Transfer and Training Unit	Deputy Director (TT)	TC10	1	11,220,000	1,122,000	2,244,000	360,000
	Research Officer	TC4	4	3,540,000	354,000	708,000	
	Nursery Coordinator	TC4	2	2,940,000	294,000	588,000	
	Extension Agronomist	TC4	2	2,940,000	294,000	588,000	
	Communication Specialist	TC5	2	4,020,000	402,000	804,000	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
	Typist	TC1B	3	1,002,000	100,200	200,400	
Subtotal Lyamungu				*26,550,000*	*2,655,000*	*5,310,000*	*360,000*
Ugano Sub-station	Extension Agronomist/Trainer	TC4	2	2,940,000	294,000	588,000	540,000
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Driver	TC1B	2	888,000	88,800	177,600	
	Cleaner	TC1B	1	774,000	77,400	154,800	
	Security guard	2		1,176,000			
Subtotal Ugano				*8,598,000*	*742,200*	*1,484,400*	*540,000*
Mbimba Sub-station	Extension Agronomist/Trainer	TC4	2	2,940,000	294,000	588,000	540,000
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Driver	TC1B	2	888,000	88,800	177,600	
	Cleaner	TC1B	1	774,000	77,400	154,800	
	Security guard	2		1,176,000			
Subtotal Mbimba				*8,598,000*	*742,200*	*1,484,400*	*540,000*
Maruku ARI	Extension Agronomist/Trainer	TC4	2	2,940,000	294,000	588,000	540,000
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Cleaner	TC1B	1	774,000	77,400	154,800	
	Driver	TC1B	2	888,000	88,800	177,600	
Subtotal Maruku				*7,422,000*	*742,200*	*1,484,400*	*540,000*
Total TTTU				*51,168,000*	*4,881,600*	*9,763,200*	*1,980,000*
Technology Transfer and Training Unit	Head of Department	TC8	3	8,520,000	852,000	1,704,000	360,000
	Research Officer	TC4	4	3,540,000	354,000	708,000	
	Nursery Coordinator	TC4	2	2,940,000	294,000	588,000	
	Audiovisual Specialist	TC5	2	4,020,000	402,000	804,000	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
	Typist	TC1B	3	1,002,000	100,200	200,400	
Subtotal Lyamungu				*20,910,000*	*2,091,000*	*4,182,000*	*360,000*
Ugano Sub-station	Research Officer	TC4	2	2,940,000	294,000	588,000	540,000
	Trainer at Uyole	TC4	2	2,940,000	294,000	588,000	
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Field Officer	TC2	2	1,410,000	141,000	282,000	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
	Field Attendant	TC1B	2	888,000	88,800	177,600	
	Driver	TC1B	2	888,000	88,800	177,600	
	Secretary/ Office Attendant	TC1B	2	888,000	88,800	177,600	
	Store Keeper/ Attendant	TC1B	2	888,000	88,800	177,600	
	Cleaner	TC1B	1	774,000	77,400	154,800	
	Security guard	2		1,176,000			
Subtotal Ugano				*15,090,000*	*1,391,400*	*2,782,800*	*540,000*
Total TTTU				*36,000,000*	*3,482,400*	*6,964,800*	*900,000*

Tanzania Coffee Research Institute
Salary scales

Grade	Point	Salary (Tsh/month)	NSSF (TSh/month)	Gratuity/ PRP (TSh/month)	Total (TSh/month)
TC1A	1	30,000	3,000	6,000	33,000
9500	2	39,500	3,950	7,900	43,450
	3	49,000	4,900	9,800	53,900
	4	58,500	5,850	11,700	64,350
TC1B	1	64,500	6,450	12,900	70,950
9500	2	74,000	7,400	14,800	81,400
	3	83,500	8,350	16,700	91,850
	4	93,000	9,300	18,600	102,300
TC2	1	108,000	10,800	21,600	118,800
9500	2	117,500	11,750	23,500	129,250
	3	127,000	12,700	25,400	139,700
	4	136,500	13,650	27,300	150,150
TC3	1	146,500	14,650	29,300	161,150
9500	2	156,000	15,600	31,200	171,600
	3	165,500	16,550	33,100	182,050
	4	175,000	17,500	35,000	192,500
TC4	1	220,000	22,000	44,000	242,000
25000	2	245,000	24,500	49,000	269,500
	3	270,000	27,000	54,000	297,000
	4	295,000	29,500	59,000	324,500
TC5	1	310,000	31,000	62,000	341,000
25000	2	335,000	33,500	67,000	368,500
	3	360,000	36,000	72,000	396,000
	4	385,000	38,500	77,000	423,500
TC6	1	400,000	40,000	80,000	440,000
25000	2	425,000	42,500	85,000	467,500
	3	450,000	45,000	90,000	495,000
	4	475,000	47,500	95,000	522,500

Grade	Point	Salary (Tsh/month)	NSSF (TSh/month)	Gratuity/ PRP (TSh/month)	Total (TSh/month)
TC7	1	530,000	53,000	106,000	583,000
30000	2	560,000	56,000	112,000	616,000
	3	590,000	59,000	118,000	649,000
	4	620,000	62,000	124,000	682,000
TC8	1	650,000	65,000	130,000	715,000
30000	2	680,000	68,000	136,000	748,000
	3	710,000	71,000	142,000	781,000
	4	740,000	74,000	148,000	814,000
TC9	1	770,000	77,000	154,000	847,000
30000	2	800,000	80,000	160,000	880,000
	3	830,000	83,000	166,000	913,000
	4	860,000	86,000	172,000	946,000
TC10	1	935,000	93,500	187,000	1,028,500
50000	2	985,000	98,500	197,000	1,083,500
	3	1,035,000	103,500	207,000	1,138,500
	4	1,085,000	108,500	217,000	1,193,500
TC11	1	1,180,000	118,000	236,000	1,298,000
70000	2	1,250,000	125,000	250,000	1,375,000
	3	1,320,000	132,000	264,000	1,452,000
	4	1,390,000	139,000	278,000	1,529,000
TC12	1	1,500,000	150,000	300,000	1,650,000
90000	2	1,590,000	159,000	318,000	1,749,000
	3	1,680,000	168,000	336,000	1,848,000
	4	1,770,000	177,000	354,000	1,947,000
				Severance	
				5%	
Security Guard		49,000		2,450	588,000

Annex 4 : Itinerary

Orientation phase

09 July 2002: MKV Carr (team leader) departed UK, arrived KIA

10 July 2002: TaCRI staff meeting, plus visits to stakeholders, Moshi

11 July 2002: TaCRI plus visits to stakeholders, Moshi and Arusha

12 July 2002: TaCRI plus visits to stakeholders, Moshi.

13 July 2002: Travel by road to Mbinga: night Mafinga.

14 July 2002: Arrived Mbinga pm; visited Ugano.

15 July 2002: Visited stakeholders Mbinga District.

16 July 2002: Travelled by road to Dar es Salaam: night Mikumi.

17 July 2002: Arrived Dar es Salaam am; meetings; night DSM.

18 July 2992: Travelled by air to Bukoba; visits to stakeholders.

19 July 2002: Visits to stakeholders.

20 July 2002: Meeting with staff at MARI: visits to stakeholders.

21 July 2002: Travelled by air to Kilimanjaro/TaCRI. Reading reports.

22 July 2002: Report and workshop preparation.

23 July 2002: Report presentation to TaCRI CED and senior staff. MKVC departed KIA pm..

24 July 2002: MKVC arrived UK.

Implementation phase

18 August 2002: MKV Carr, William Stephens, HAM Van der Vossen arrived KIA.

19 August 2002: TaCRI

20 August 2002: TaCRI staff meeting; tour of TaCRI; preparations for workshop.

21 August 2002: Preparations for workshop; reading reports.

22 August 2002: Stakeholder Workshop, Moshi.

23 August 2002: Stakeholder Workshop, Moshi.

24 August 2002: TaCRI; workshop report preparation.

25 August 2002: Reading reports; report preparation.

26 August 2002: Meetings with TaCRI staff; report preparation.

27 August 2002: As above.

28 August 2002: As above.

29 August 2002: As above. HVdV stakeholder visit.

30 August 2002: As above. HVdV stakeholder visit.

31 August 2002: Report preparation. HVdV departed pm to The Netherlands.

01 September 2002: Compiling report: SAP draft submitted to CED pm

02 September 2002: Amendments to report. Final Report and SAP submitted to CED.

03 September 2002. Presentation of report and SAP to CED and TaCRI senior staff

04 September 2002. MKVC and WS arrived UK

Completion and presentation phase

02 November 2002: MKV Carr visited Mbozi district including Mbimba research station

03 November 2002: MKVC travelled to Dar es Salaam

04 November 2002: MKVC visited CMU, EU, Tanzania Meteorological Agency, and DRD, MAFS; departed DSM

05 November: MKVC arrived UK

13 January 2003: MKVC and WS departed UK and arrived KIA

14 January 2003; meetings with TaCRI staff; tour of Lyamungu station

15 January 2003: meetings with TaCRI staff

16 January 2003: revising and adding to SAP report

17 January 2003: as above

18 January 2003: as above

19 January 2003: as above

20 January 2003: presentation to the Board of Directors

21 January 2003: finalising SAP report

22 January 2003: as above; departed LCRC

24 January 2003: MKVC and WS travelled to UK

25 January 2003: MKVC and WS arrived UK

Throughout both phases of the study M r T. S. Nzallawahe, Head of the TaCRI Technology Transfer and Training Unit, accompanied the consultants on visits, and facilitated the mission at every opportunity. We are grateful for his support and guidance, without which much less would have been accomplished.

Annex 5 : Orientation phase report Tanzania Coffee Research Institute

Consultancy to develop Strategic Action Plan (SAP)

Orientation Phase Report

9-23 July 2002

By MKV Carr and Anna Nyanga

Representing Cranfield University, UK

Aim of the consultancy

To assist TaCRI staff in the formulation of the medium term (3 – 5 year) research and development strategy in order to rejuvenate the Tanzanian coffee industry

Orientation phase:

Specific tasks:

1. Project mobilisation.
2. Review of project methodology.
3. Review and synthesise reports.
4. Carry out stakeholder analysis.
5. Review and agree changes to implementation phase.
6. Write inception report.

Outputs:

1. Local counterparts identified.
2. Review and synthesis of previous consultancy and other reports.
3. Local stakeholders identified and meetings held with key stakeholders.
4. Details of implementation phase agreed with client.
5. Workshop details agreed.
6. Inception report presented outlining summary of stakeholder analysis, details of implementation phase, including workshop, and revised log frame.

Project mobilisation

The team leader, Professor M K V Carr, departed from the UK on Tuesday 9 July arriving at Kilimanjaro International Airport on the same day. The timing of the implementation phase was agreed with the client and Cranfield alerted all the team members. On arrival, the SAP Consultancy Coordinator, Mr T S Nzallawahe, presented the Team Leader with a comprehensive compilation of previous reports

and minutes of relevant meetings. A detailed programme of visits, and meetings with key stakeholders, had been arranged for the consultants The Team Leader was joined in Moshi by Ms Anna Nyanga on 11 July who accompanied him throughout the remainder of this phase.

Review of project methodology

The Team Leader met with the Chief Executive TaCRI, Professor J M Teri, on the morning of Wednesday 10 July, together with the Consultancy Coordinator, Mr T Nzallawahe, when the timing and logistics of the project were agreed. It was necessary to extend the duration of the orientation phase by two days, beyond those agreed in the contract, in order to complete the stakeholder analysis. It was unfortunately not possible to meet with the EU in Dar es Salaam.

Review and synthesise reports

Both consultants read the reports during the course of the visit at every available opportunity. They were able to familiarise themselves with the issues, and previous recommendations.

Stakeholder analysis

Visits were made to stakeholders in the north (Arusha and Kilimanjaro Regions), the south (Mbinga District in Songea Region), Dar es Salaam, and the West Lake (Bukoba District in Kagera Region). A full list of the people interviewed will be presented elsewhere, but they included farmers, estate managers, processors, an exporter, the Tanzania Coffee Board, District Council officials, District and Regional Commissioners, the Coffee Management Unit, the National Authorising Office, Ministry of Agriculture and Food Security, staff at Ugano Coffee Research Centre and the Lake Zone Agricultural Research and Development Institute (Maruku), the Kilimanjaro Native and Kagera Cooperative Unions, and an NGO (Mayawa). Meetings were also held with the chairman of the TaCRI Board and with senior TaCRI staff. A clear and generally consistent overview of the state of the coffee industry in Tanzania was obtained, and of the role that TaCRI could/should play emerged. Some of the principal issues raised by stakeholders are summarised below under four headings, the external environment, producers, extension and training, and research.

External environment

- The importance of the external or enabling environment in which the coffee sector operates was emphasised. Current problems are linked to low world prices, low quality, poor marketing, high taxation and sundry deductions reducing the price paid to farmers, the role of the TCB, the auction, current licensing constraints (leading in part to extended marketing chains), the bad reputation of the co-operative unions, lack of access to credit by farmers, the poor state of rural roads, the cost of sisal bags, access to ports and uncompetitive handling charges (for example compared with Uganda). The list could be extended….

- Tanzania must develop/enhance its reputation for producing quality coffee consistently in large enough quantities to attract buyers. The decline in quality in recent years is linked to poor processing by farmers, and the lack of premiums for quality coffee. Unscrupulous traders, taking advantage of farmers' need for cash in hand, contribute to this situation. Speciality marketing and branding are seen as possible ways forward.
- Unless these issues are addressed, and overcome, the coffee industry in Tanzania will continue to decline. Research can only be truly effective if committed people address these external constraints, and identify and implement solutions as a matter of urgency. *TaCRI has an important role to play in this process.*

Producers

- Costs of production for estates and smallholders currently exceed prices realised at auction. This is an unsustainable position. It means that the coffee trees are neglected, inputs reduced or stopped completely, tree husbandry is neglected whilst farmers seek to maintain their livelihoods through more productive/profitable activities. In turn this leads to reductions in quality, and even lower prices. If prices do not improve, one estate, which has been growing coffee for 70 years, is prepared to abandon coffee production after this year. There are also health issues associated with inappropriate ways of handling pesticides.
- Once economics allow, a programme of replanting needs to be initiated as soon as possible in order (a) to reduce costs of production, and (b) to increase productivity per tree or per hectare, depending on the production system, without sacrificing quality. This depends on the availability of improved planting material, in sufficient quantities. For Arabica coffee, the particular need is for the disease resistant cultivars to be multiplied rapidly and tested in farmers' fields. For Robusta coffee, due to the low prevailing prices, there is at present no demand for planting material despite the availability of early maturing clones from established nurseries.
- Quality is of overriding importance to the future of the industry in Tanzania. It begins in the field but can be lost if primary processing at the farm, by contractors, or in central pulperies, is not performed well. The practice of some/many buyers not to pay differential rates for high quality beans is demoralising for those farmers attempting to maintain standards. As a result quality (and prices) continue to decline.
- Farmers are unable to afford inputs, particularly pesticides. Few farmers are applying inorganic fertilisers, some continue to apply organic manures (FYM, composts) subject to availability on farm or, in some cases, purchased from suppliers. Mulch is widely used where available, and when there is no risk of fire. Some farmers are experimenting with the use of natural pesticides.
- Coffee wilt, a disease relatively new to Tanzania, continues to threaten the already weakened Robusta industry in Kagera Region. No control measures are available, and no resistant varieties have yet been identified in Tanzania. Farmer's livelihoods are being threatened. It is depressing to witness. *TaCRI need to identify resistant cultivars.* Regional links could be important.
- Farmers are not organised and do not have access to information. *TaCRI could support the formation of farmer groups, and ensure that farmers are well*

informed on, for example, marketing information, and costs of production and processing.

- An important strategic issue is whether 'unproductive' small coffee farms should be encouraged to continue in production, or should the emphasis be to support the evolution of larger, intensive farm units, especially in areas where land is scarce. Coffee growers tend to belong to the older age group, and younger people need to be encouraged to continue in the industry, otherwise they will take up more profitable activities.
- In short, all producers are experiencing very difficult times. Remember farmers are paying the salaries of TaCRI staff (and others) whilst losing money themselves. *TaCRI must recognise this, and prioritise its activities accordingly.*

Extension and training

- Coffee farmers need good, reliable advice if they are to remain in business, and to succeed in the future. Extension staff, whether local government or NGOs, need to be trusted by the farmers they serve. In turn, they need to have confidence in their own abilities. The need for effective extension services, which includes training of farmers (especially younger ones) and extension staff in coffee husbandry and primary processing, budget management (understanding the true costs of production) and market awareness ('researchers must link farmers to the market') is widely recognised. Indeed, extension is given the highest priority by many stakeholders.
- Existing information must be made widely available in formats that are relevant, attractive, understandable and useful. Important initiatives are being taken in Mbinga District to revitalise the extension services, and to monitor their activities. This example can be followed and replicated elsewhere. *Again, TaCRI has an important role to play in supporting technology transfer programmes, and in the provision of client oriented training at many levels (including policy makers) throughout the country.*

Research

- Research can only be effective, and chances of uptake improved, if the external environment is supportive, if farmers are in a position to implement the outputs of research (and have confidence in their reliability and value), and if there is an effective delivery mechanism through an appropriate extension service, or direct to the farmer by researchers. It is also a two-way process, with information flows in the opposite direction. Researchers need to understand policy issues, marketing constraints and opportunities, the livelihood systems of farming households (e.g. access to capital in its various forms[1]), and hence the relevance of the research in terms of the needs of farmers. *TaCRI researchers must not be isolated from the key stakeholders they serve, and who pay their salaries.*
- Technical research needs identified by stakeholders as being of immediate importance included: the continued development of disease resistant cultivars (both Arabica and Robusta), including their effective and rapid release for evaluation by farmers in different coffee based farming systems (ecological

[1] Human, social, physical, natural and financial

areas), cost effective integrated pest management systems, nutrient management (organic and inorganic), including the provision of soil and leaf analytical services (commercial), and primary processing technologies suitable for use at the farm level.

- In addition, there is a widespread view that TaCRI should also be involved in understanding and explaining the economics of coffee production and processing, influencing policy makers, supporting new marketing initiatives, and understanding the livelihoods of farming households to ensure that research is appropriate to their needs. The role of credit in making available inorganic fertilisers to farmers is, for example, a researchable issue. In short, this research area could be summarised under the title 'income security' to reflect the need to focus research on livelihoods dependent on cash to sustain them, and not just on technologies that may or may not be affordable. *TaCRI needs to respond to this perceived, but real, need although it has not been normal to include it in the mandate of traditional crop based research institutes in the past.*
- Whilst there is an urgent need to respond to the short term needs of the industry, particularly at such a difficult time, *TaCRI researchers must not lose sight of the need to take a longer term view, and to anticipate the answers to questions that the industry may be asking in 10 years time.* The need for new cultivars will continue. These can be sourced from germplasm collected from many parts of the world, and then exploited for use in Tanzania. Each new cultivar is likely to have different optimum spacing and pruning regimes. These need to be assessed. Innovative techniques need to be explored. Progressive smallholders will, in the future, demand the most up to date techniques, as well as the estate sector.
- Research is not just about discovering new things, it is also about reviewing, reinterpreting and representing old information in ways which are of value today. Much good work has been done in the past at Lyamungu, and in neighbouring countries. *TaCRI scientists need to be familiar with this research as well as with current work elsewhere in the world*. Easy access to the literature is critical. Literature reviews do not stop when you complete your MSc or PhD!
- The results of research must be made available to the industry and to the wider scientific community in the most appropriate ways. *TaCRI must actively promote to stakeholders its role and contribution to the industry*. There is a demand for a new handbook (the last one which is still used by some growers was published in 1964!), open days, and concise advisory leaflets.
- *The expectations of the new TaCRI from the industry and government are immense. New approaches and attitudes are mandatory. There is a lot of work to do, but it needs to be prioritised within a finite budget. Have confidence, THINK BIG, but remember the farmer. Their success is your success!*

Agree changes in implementation phase

Details of the workshop programme, together with a log-frame, are presented separately for approval. It is suggested that the title of the workshop should be 'Research FOR Development---------THINKING BIG' in order to emphasise the need for research to be focused on development issues, improving the livelihoods of farmers through effective uptake of outputs, and that stakeholders and TaCRI staff need, in their thinking and expectations, to go beyond the traditional view of what research can contribute to the development of a successful industry. Workshop participants have been agreed. Invitations will be

issued by TaCRI as soon as possible (before the end of July). Professor Nuhu Hatibu, supported by Ms. Anna Nyanga, will facilitate the workshop. Rapporteurs (consultants with support of TaCRI staff) need to be identified. No changes to the scope or timing of other activities in the implementation phase are anticipated.

Present inception report

Presented to Executive Director TaCRI and senior staff prior to departure on 22 July 2002.

MKVC and AN

21/07/02

Moshi

Annex 6 : Workshop report
Tanzania Coffee Research Institute

Workshop to Develop a
STRATEGIC ACTION PLAN
For TaCRI

22 – 23 August 2002
Lutheran Uhuru Hostel, Moshi

Cranfield University
Silsoe
Bedford
MK45 4DT
UK

27 February 2007

Contents

INTRODUCTION

The Tanzania Coffee Research Institute (TaCRI) has an overall goal of improving the productivity and profitability of the coffee industry throughout the country.

To achieve this goal it aims to develop a successful, cost effective and sustainable coffee research institute capable of supporting the rejuvenation and continued development of the coffee industry in Tanzania.

In order to take the views of coffee industry stakeholders into account, TaCRI, in association with the Cranfield University consultants, organised a stakeholder workshop in Moshi. The purpose of this two-day workshop was to identify and agree the priority research, extension and training activities to be undertaken by TaCRI, in partnership with other stakeholders, over the next five years.

The key outputs from the workshop were:

- identification and prioritisation of policy, farm level, technology transfer and other constraints to the development of the coffee industry;
- identification and prioritisation of actions needed to overcome the constraints; and
- identification of priority research for development, technology transfer and training activities to be undertaken by TaCRI and other agencies.

This report summarises the workshop proceedings and serves as a record of the outputs achieved.

SUMMARY OF CONSTRAINTS AND ACTIONS

Introduction

The following sections highlight the key constraints identified by workshop participants and the associated actions. The full list of constraints and actions is presented in Annex C.

Policy environment

The key constraints identified in the policy environment related to poor policy advocacy, inconsistency of coffee policy, over regulation and taxation of the industry and lack of timely decision making. There was a clear view that the Tanzania Coffee Board is neither efficient nor effective and that there are too many players in the industry with poorly defined roles. This confusion in regulation and organisation is further compounded as there is no one line of command for coffee extension and therefore farmers are not well served with vital information and services. There was also a call for subsidies to support coffee growers during periods of very low prices.

A number of actions were proposed to address these constraints. The first was to create a strong and effective stakeholder forum based on the Annual Coffee Conference, which should immediately be constituted so as to be truly representative of producers, processors and exporters. There were comments in the plenary session that this is already the case in theory but there is still a need for the Government to put this into practice.

The workshop concluded that the new coffee stakeholders' forum (hereafter called the Coffee Forum) should work with TaCRI and the government to conduct an urgent review of existing policies and regulations relating to coffee. Procedures need to be streamlined and bureaucracy minimised in order to facilitate rather than restrict the development of the coffee industry.

In order to address the perceived weaknesses of the TCB, the Coffee Forum should work with the government to review its purpose and to recommend how it should be restructured to best serve the industry. TaCRI and the Coffee Forum should also take the lead in helping government to clarify and assign roles to the other organisations associated with the industry.

Subsidiary constraints identified related to the shortfall in human and financial resources for effective coffee research. The suggested action was for TaCRI and the Cranfield University consultants to finalise and agree the Strategic Research Action Plan for immediate implementation.

Overall, the workshop participants recognised that many of the constraints in the policy environment could seriously endanger TaCRI's ability to deliver the knowledge and technologies necessary for Tanzania's coffee industry to increase its productivity and profitability. Without a concerted effort to address these policy issues by government and other stakeholders, the success of TaCRI's strategic action plan may be jeopardised.

Markets, marketing and trade

The primary constraint relating to markets, marketing and trade is, of course, the prevailing low world prices for coffee. The workshop proposed that regulations needed to be changed in order to facilitate the marketing and sale of Tanzanian coffee, to identify and exploit niche markets (particularly for high quality coffee) and to reduce costs. These actions are the responsibility of the TCB, the Co-ops and the Tanzania Coffee Association (TCA). Related constraints were the over-regulated marketing system, the lack of aggressive marketing of Tanzanian coffee and the ineffectiveness and lack of transparency of the existing auction system.

Participants were concerned that the lack of differential prices for quality coffee (both Arabica and Robusta) paid to farmers was a serious constraint to maintaining the good reputation of Tanzanian coffees on the world market. Action was needed by the Primary Associations, TCB and Co-ops to promote grading at farm level, to employ and train experts at buying points and to pay strictly according to quality.

Constraints requiring action by TaCRI included the limited availability of market information and market research, and the low level of national coffee production. To address the marketing constraints, TaCRI, in association with TCB and the TCA need to improve the dissemination of market information and to undertake market research to better understand the world market. TaCRI should, of course, be closely involved with tackling input and production constraints – working in partnership with growers and other organisations.

Processing and quality control stage

The key constraints identified under this heading were the inadequate number of central pulperies and hulling machines (for washed and hard coffees including Robusta), and the limited awareness by some farmers of the need for a quality focus when processing. TaCRI is seen as having an important role, working with other parties, to help to remove these constraints through the rehabilitation of existing facilities, the promotion of new facilities, and farmer education to ensure that quality is a prime consideration.

Other constraints that TaCRI should be addressing with others are the high costs of electricity and fuel for processing. This requires action to develop alternative fuel sources, to promote fuel-efficient machinery and to lobby for tariff reductions. The workshop also suggested that TaCRI could also undertake research on the use of coffee by-products to increase the total value that can be realised from coffee production.

Production stage

The workshop participants identified a large number of constraints at the production stage, most of which required action by TaCRI, either independently or in association with other organisations. These constraints could be grouped into three main headings related to: low productivity, insufficient knowledge and inadequate finance.

Low productivity

The major constraints contributing to low productivity were identified as poor cultural practices, a high incidence of pests and diseases, old coffee trees and frequent moisture stress. TaCRI, in collaboration with Kilimo, NGOs and Sokoine University of

Agriculture, needed to provide a range of services to the producers, for example, training for trainers, education for farmers, demonstration plots and on-farm trials.

The actions needed to address the high incidence of pests and diseases include germplasm enhancement and the continuation of the breeding programme for resistant varieties, supported by surveys, integrated pest management studies (IPM) and training on the identification and control of coffee pests and diseases. TaCRI should be intimately involved with all these actions, with assistance from Kilimo and other national and international research institutes.

The related constraint of old coffee trees also requires action by TaCRI to identify the scale of the problem and to draw up a programme for replacement of old trees through increased nursery output, and possibly the use of tissue culture facilities to propagate rapidly new cultivars.

Insufficient knowledge

Insufficient knowledge by farmers was identified as being a result of a combination of poor extension services, leading to poor application of inputs, inadequate skills in production and primary processing, and limited awareness of the importance of quality to the coffee industry. Key actions involve TaCRI working with Kilimo and NGOs to address these constraints through better research-extension linkages and training for subject matter specialists.

Inadequate finance

Inadequate access to finance has resulted in poor infrastructure leading to high costs of production, demoralised farmers low returns making coffee farming unattractive to young people. Most of these issues were not seen as being within TaCRI's remit to address as they require action by local and central government, the TCB and Co-ops to improve feeder roads, reduce taxes and levies, extend credit and provide reliable markets.

Other constraints to production

Uneconomic farm sizes and competition from other farm enterprises were also identified as constraints to production. TaCRI was seen to have an important role in conducting socio-economic studies to identify and document the minimum economic farm size and to identify means of improving returns to farmers from coffee growing. Participants suggested that other organisations such as government, farmers groups, Co-ops and the TCB should take action to encourage farmers to pool land resources and to move to areas where land constraints are less severe.

Inputs stage

Constraints at the inputs stage were wide ranging, but matched closely with those identified at the production stage. Thus the unavailability of improved coffee varieties, the inadequate dissemination of research results and the lack of up-to-date recommendations, the poor follow-up of field trials and the failure to involve producers in the development of research programmes all require action by TaCRI to develop, package and disseminate appropriate and clear extension advice based on sound research involving producers wherever relevant.

CONCLUSIONS

During the workshop participants were asked to concentrate first on identifying general constraints, then prioritising them, and finally focussing on the actions that should be taken by TaCRI and other organisations to remove or minimise them. This approach worked well and benefited from the wide range of skills and experience amongst the participants representing all sectors of the industry and all regions where coffee is being grown.

Many of the overriding factors constraining the coffee industry in Tanzania are related to the restrictive and confused policy environment. Without addressing these regulatory and organisational issues the likelihood of establishing TaCRI as an effective and sustainable research institution are greatly reduced. There are a large number of other technical and social constraints that limit the rejuvenation and development of the coffee industry. The workshop successfully identified actions to be taken in relation to many of these for incorporation into the TaCRI Strategic Action Plan.

The consensus of the participants was that the key objectives and outputs of the workshop were achieved and that these form a strong platform from which the detailed Strategic Action Plan can be developed.

TaCRI's mandate to be involved in "… *all matters relating to coffee production, pulping, processing, curing, liquoring, quality, farming systems and systems of husbandry of other crops as are associated with coffee*…"[4] together with "*training and extension*" has been reaffirmed by the coffee industry, as represented by the workshop participants. It is now TaCRI's responsibility to "think big" and "act big" by undertaking effective research FOR development.

[4] Excerpt from the Memorandum of Association of the Tanzania Coffee Research Institute

Annex A: Workshop Logical Framework

Strategic Action Plan Workshop

22-23 August 2002

Moshi

Goal: to improve the productivity and profitability of the coffee industry throughout Tanzania

Aim: to develop a successful, cost effective and sustainable coffee research institute capable of supporting the rejuvenation and continued development of the coffee industry in Tanzania.

Purpose of workshop: to identify and agree the priority research, extension and training activities to be undertaken by TaCRI, in partnership with other stakeholders, over the next five years.

Outputs:

- Policy, farm level, technology transfer and other constraints to the development of the coffee industry identified and prioritised.
- Actions needed to overcome the constraints identified and prioritised.
- Priority research for development, technology transfer and training activities to be undertaken by TaCRI and other agencies identified.

Objectively verifiable indicator: by the end of day two of the workshop substantial agreement is reached on the priority activities to be undertaken by TaCRI over the next five years for incorporation in the Strategic Action Plan.

Means of verification: summary of workshop proceedings; Strategic Action Plan

Risks and assumptions: representative and key stakeholders attend the workshop and contribute positively to the discussions

Annex B: Workshop Methodology & Timetable

This workshop was the second stage of the stakeholder analysis required under the terms of reference of the TaCRI Strategic Action Plan consultancy. It followed on from the orientation phase in July 2002 during which previous consultancy and other reports on coffee research in Tanzania were synthesised, and a stakeholder analysis was conducted.

During the stakeholder analysis key stakeholders in Mbinga district, Kilimanjaro, Arusha and Kagera Regions and in Dar es Salaam were interviewed to identify their needs and constraints. The cross section of stakeholders included smallholder and estate coffee growers, coffee buyers, processors, exporters, marketing specialists and regulators, policy advisors, researchers, extension service providers, inputs suppliers, non government organizations (NGOs), and financiers.

Key individuals representing the entire cross section of stakeholders were then invited to the workshop. The principal coffee growing areas were represented. About 45 key stakeholders including the consultancy team members and senior TaCRI staff attended and contributed actively[5] to the proceedings. The workshop facilitator was a member of the consultancy team. The workshop was conducted in both English and Swahili to ensure the maximum opportunity for participation.

A summary of the stakeholder analysis was presented at the workshop as an input to the discussion on the constraints coffee industry in Tanzania. The participants then had an opportunity to comment on this analysis.

The workshop process was built on stakeholders' involvement and participation. There were two group discussion sessions with well-defined outputs[6]. During the first session, participants identified a prioritised list of constraints to the coffee industry under five topic headings (input stage; production stage; markets, marketing and trade; processing, quality and value adding; and policy environment). In the second session the groups identified and prioritised actions to be taken by TaCRI and other agencies.

Each group presented their outputs during plenary sessions giving the opportunity for all participants to comment on and affirm the recommendations.

Finally, workshop participants evaluated the workshop to provide feedback to the organisers on the strengths and weaknesses of the process[7].

[5] See Annex E for a detailed list of workshop participants.

[6] See Annex A for the logical framework for the workshop.

[7] See Annex D for the workshop evaluation.

Workshop programme for developing a Strategic Action Plan (SAP) for the Tanzania Coffee Research Institute

Thursday 22 and Friday 23 August 2002
Lutheran Uhuru Hostel, Moshi
Facilitator: Professor Nuhu Hatibu

TIME	ACTIVITY	RESPONSIBLE PERSON
DAY 1 **08.00**	**Welcome address by the Chief Executive of TaCRI**	**Prof. J.Teri**
08.15	**Introductory remarks by the Chairman TaCRI Board of Directors**	**Mr.E.Mtei**
08.45	**Purpose of the workshop**	**Facilitator**
09.00	**Participants pair-wise introductions**	**Facilitator/all**
09.45	**Health break**	**All**
10.00	**Presentation of issues identified during stakeholder analysis**	**Prof. M. Carr & Ms.A. Nyanga**
10.30	**Participants responses**	**Facilitator/all**
11.00	**Coffee break**	**All**
11.30	**Group discussions I (identification and prioritisation of constraints)**	**Facilitator/all**
12.30	**Lunch break**	**All**
13.30	**Group discussions I (continued)**	**All**
15.00	**Coffee break**	**All**
15.30	**Group presentations I**	**All**
17.30	**Close**	
DAY 2 **08:00**	**Introduction**	**Facilitator**
08.15	**Group discussions II (prioritised activities to be undertaken by TaCRI and other agencies)**	**All**
10.00	**Coffee break**	**All**
10.30	**Group discussions II (continued)**	**All**
12.30	**Lunch break**	
13.30	**Group presentations II**	
15.00	**Conclusions: workshop evaluation**	**Facilitator/all**
15.30	**Closing Remarks**	**Chairman of TaCRI Board**
15.45	**Coffee and depart**	

Annex C: Workshop Outputs

The following pages reproduce the outputs of the discussion groups focussing on he Policy Environment; Markets, Marketing and Trade; Processing and Quality; Production; and Inputs. The output from each group was presented and verified in a plenary session.

Policy Environment

Constraint	Actions		
Poor policy advocacy for the coffee industry	Formalise transfer of ownership of Annual Coffee Conference to coffee stakeholders immediately (Govt)	Create a strong and effective stakeholder forum (TaCRI & others)	Operationalise the forum (Govt./ TaCRI & others)
Inconsistency in coffee policy and application	Revisit existing policies on coffee (TaCRI & others)	Advise the Govt. accordingly and follow-up (Forum)	Treat all players equally (Forum)
TCB under liberalised marketing system not efficient nor effective	Review the need of TCB and restructure accordingly (Govt./ Forum)		
Lack of timely decision making	Ensure timely decision making and accountability (Govt./ Forum/ TaCRI)		
Over regulated coffee industry/ Multiple and excessive taxation	Review existing rules & regulations and streamline (Forum/ Govt.)	Consult rules and regulations in other coffee producing countries (Forum)	
No crop subsidy to farmers	Prioritise allocation of resources (Govt.)		
Too many players in the industry without clearly defined roles	Clarify and assign roles (TaCRI/ Forum)		
No one line of command in coffee extension	Determine focal point of extension delivery (Govt. / Forum)	Facilitate and coordinate coffee extension services (Govt./Forum/ TaCRI)	
Inadequate performance of farmer organisations (not really policy issue)	Promote & assist formation of farmer groups/associations (Govt./others)		
Ailing farmer cooperatives	Follow-up on initiative being undertaken by Ministry of Co-operatives (Govt.)	Co-operate and liaise with Ministry of Marketing - training of crop officers in coffee quality issues (TaCRI)	Depoliticise crops. Avoid nepotism in recruitment of staff. Engage competent staff.
Shortfall in human and financial resources for effective research	Finalise coffee research strategy (Consultants/ TaCRI)	Secure adequate funding for identified priority areas of research (TaCRI)	Recruit necessary and qualified research staff (TaCRI) Conduct effective research (TaCRI)
Inadequate motivation to researchers/ extensionists	Ensure adequate scheme of motivation and implement (TaCRI)		
Land ownership/ tenure not attractive to investment	Review the right of land ownership in favour of the market (Govt.)		
Lack of incentives to move into high potential areas where land is not a constraint	Provide enabling environment (Govt.)		

Markets, Marketing and Trade

Constraint	Actions	Responsible
Low world market prices	1. Change regulations	TCB, Co-ops, TCA
	2. Look for niche markets	
	3. Reduce costs	
No differential prices for quality of parchment coffee	1. Promote grading at farm level	PCBs, Co-ops, TCB
	2. Train and employ "Experts" at buying points	
	3. Strictly pay according to quality	
No differential prices for quality hard coffees (including Robusta) whether in cherry or hulled form	1. Promote grading at farm level	PCBs, Co-ops, TCB
	2. Train and employ "Experts" at buying points	
	3. Strictly pay according to quality	
Little or no aggressive promotion of Tanzanian Coffees domestically or internationally	1. Allocate adequate funds for promotion annually	TCB, local roasters, TCA
	2. Utilise all forms of publicity including the internet	
	3. Participate in international promotional events aggressively	
Over regulated marketing system thereby reducing our competitiveness in the world market and paid to the farmer	Review and streamline rules and regulations	TCB, MAFS, Ministry of Cooperatives, Ministry of Finance, TaCRI
The current auction system is not transparent enough and is ineffective	Review auction system and take appropriate action	TCB, MAFS, Ministry of Cooperatives
Inadequate production quantities to attract serious buyers, particularly for quality coffees	Tackle input & production constraints effectively	TaCRI & others
Very little market information, if any, reaches the farmer in an understandable form	1. Improve market information in both Swahili & English	TCB, District Councils, Media, TaCRI
	2. Monthly or quarterly information bulletins distributed to growers	
Inadequate market research	Initiate plans & programmes for market research	TCB, TaCRI, TCA
Grading system not in harmony with current international practices in both hard (including Robusta) and mild coffees	Review our system and harmonise with international system	TCB, TCA
No price stabilisation mechanism	Institute mechanism when prices go up	TCB, Govt.

Processing and Quality Control Stage

Constraint	Actions	
	Actions	Responsible
Inadequate number of central pulperies resulting in poor quality coffee production by smallholders	1. Rehabilitate existing pulperies 2. Promote construction of new pulperies 3. Later enforce use of central pulperies	TaCRI & others
Inadequate number of machines at farm level for hard coffees (incl. Robusta)	1. Promote on-farm hulling of hard coffees 2. Develop appropriate & affordable hulling machines 3. Provide credit facilities to acquire them	TaCRI & others
Lack of quality consciousness at primary processing level	1. Intensify farmer education 2. Pay differential prices for quality	TaCRI & others
Clean water shortage for processing in many areas	1. Rehabilitate and protect water sources & systems 2. Construct boreholes and reservoirs 3. Promote water harvesting	TCB, PCB, NGOs, Local Govt., individuals, donors
High cost of electricity and fuel for processing	1. Find alternative sources of energy 2. Promote fuel efficient machinery 3. Lobby for tariff reduction	TaCRI & others
Poor quality coffees from some curing factories of hards (incl. Robusta)	1. Modernise old factories	TCB & others
No research on the use of coffee by-products	1. Include research on use of by-products in TaCRI action plan	TaCRI

Production Stage

Constraint	Actions	Actions		
		TaCRI	TaCRI + others	Others
1. Low productivity				
1.1 Poor cultural practices	Training of trainers	TaCRI	Kilimo, NGOs University	
	Education of farmers	TaCRI	Kilimo, NGOs University	
	Demo plots	TaCRI	Kilimo, NGOs University	
	Conduct on-farm trials on improved cultural practices	TaCRI	Kilimo, NGOs University	
1.2 High incidence (infestation) of pests and diseases	Pest and disease surveys	TaCRI	Kilimo	
	Germplasm enhancement	TaCRI	ARI	
	Breed resistant varieties	TaCRI	ARI	
	Integrated Pest Management studies	TaCRI	Kilimo, Universities, ARI	
	Training on identification and control of pests and diseases	TaCRI		
1.3 Too old coffee trees	Identification of the problem and drawing up the programme of replacement	TaCRI		
	Increase nursery output	TaCRI	Kilimo, Stabex, NGOs	
	Replacement of the old coffee trees	TaCRI	Kilimo	Farmers
	Feasibility study for use of tissue culture facility to urgently produce seedlings	TaCRI	Central Govt	
1.4 Frequent moisture stress	Breed drought resistant varieties	TaCRI	ARI	
	Training farmers on cultural and husbandry practices	TaCRI	Kilimo, NGOs	
	Irrigation		Kilimo, Local & central Govt.	
	Legislation		Local govt.	
2. Insufficient knowledge				
2.1 Poor extension services	Train more SMS on coffee	TaCRI	Kilimo, NGOs	
2.2 Poor application of inputs	Motivation	TaCRI	NGOs	
2.3 Inadequate skills in production & primary processing	Strengthen research - extension - farmer linkages.	TaCRI	Kilimo	
2.4 Limited awareness of the importance of quality to the coffee industry	Payment according to quality grades			
3. Inadequate finance				
3.1 Poor infrastructure leading to high costs of production and marketing	Improve feeder roads and communication			Local & Central Govt.
3.2 Demoralised farmers	Reduce over-taxation and levies			Local & Central Govt.
	Extend credit			Banks & Coops
	Reliable markets			TCB & Co-ops
	Subsidise farmers			Coffee industry, donors, central govt.
3.3 Coffee production not attractive to the young	Improvement of rural life			
	Educate the youth to appreciate farming			
	Make agriculture profitable and dynamic industry			
	Undefined land tenure system			
4. Uneconomic farm sizes	Identify and document minimum economic farm sizes	TaCRI		
	Encourage farmers to move to other areas			Local & Central Govt.
	Pool land resources			Farmers
5. Competition from other enterprises	Improve returns from coffee	TaCRI		TCB, Govt., Co-ops, Farmers

Input Stage

Constraint	Actions		
	TaCRI	TaCRI + others	Others
Unavailability of improved coffee varieties	Accelerated multiplication of improved coffee cultivars and distribution	Accelerated multiplication of improved coffee cultivars and distribution	Accelerated multiplication of improved coffee cultivars and distribution
Research results not adequately and appropriately disseminated	TaCRI to package and disseminate clear and adequate technical messages	TaCRI to package and disseminate clear and adequate technical messages	
Outdated recommendations	Review, update and disseminate	Review, update and disseminate	
Inadequate research and extension linkage	Review and strengthen	Review and strengthen	
Use of inputs not cost effective	Continued research for appropriate interventions		
Unrealistic credit facilities	Develop and recommend appropriate interventions	Develop and recommend appropriate interventions	
Excessive management cost	Advocate review and adjustment of agric. Services delivery system		
Low effective demand for agro-inputs in rural areas	Promote credit systems	Promote credit systems	Promote credit systems
Shrinking farm land in traditional coffee growing areas	Socio-economic research for higher returns per unit area	Socio-economic research for higher returns per unit area	
Land degradation		Advocacy for intensified land use practices	Advocacy for intensified land use practices
Poor field trials follow-up	Improved participatory field trials	Improved participatory field trials	
Producers not involved in the development of research programmes	Develop mechanisms for producer involvement in research programmes		
No specialised coffee training short course		Develop specialised training courses for all stakeholders	
Shortage of expertise	Develop manpower training needs and appropriate scheme of service		

Annex D: Workshop Evaluation

Table 4. Most liked features of the workshop

Item	Frequency	(%)
Lively and openness of discussion, participatory environment and effective participation by key stakeholders	9	25
Involvement of cross section of participants, diversity of their involvement in coffee industry and variety of high quality knowledge	9	25
Moderation clarity, conduct and excellent facilitation of the workshop	7	19
Organisation of the workshop	5	14
Good cooperation between organisers and participants	3	8
Appreciation of the role of TaCRI to Coffee Industry	1	3
Pair-wise introductions	1	3
Programme	1	3
Totals	**36**	**100**

Most participants appreciated the involvement of a wide cross section of key coffee stakeholders in the identification of constraints and in developing TaCRI Strategic Action Plan. The facilitation skills of the moderator, participatory approaches used during the workshop and organisation of the workshop was as well acknowledged.

Table 5. Most disliked features of the workshop

Item	Frequency	(%)
None	7	27
Poor participation, late arrival and absence during some sessions by Tanzania Coffee Board (TCB) representatives	5	20
Short time for workshop and plenary	4	16
Very few participant contributed to TCB related issues	3	11
Disturbance from cell phones	3	11
Late arrival of some participants and late finishing	2	7
The fact that what we have done may not help us quickly enough	1	4
Type of food served no " *Nyama Choma"*	1	4
Totals	**26**	**100**

Many participants felt that they did not dislike anything about the workshop. However a significant number noted that there was poor participation by representatives from TCB. A few considered that the two days allocated for the workshop was too short. Finally, one participant disliked the exclusion of *nyama choma* from the menu!

Annex E: List of participants

Name	Organisation	Address	Email
Hussein Mongi	Alpha Seed Co	Box 1743, Moshi	mongiast@africaonline.co.tz
Amir Hamza	Amir Hamza (T) Ltd	Box 617, Bukoba	amimza@yahoo.com
Jackson Nkuba	ARDI-Maruku	Box 127, Bukoba	jmnkuba@yahoo.com
Philip S Mbogela	Coffee Management Unit	DSM	kwiilondo@hotmail.com
Martin L Kyomo	Consultant	Box 2258, Morogoro	dasp@suanet.ac.tz
Anna W Nyanga	Cranfield University – SAP consultant	TRIT, Box 2177, DSM	mtrs@twiga.com
Herbert Van der Vossen	Cranfield University – SAP consultant		vossham@tref.nl
Mike Carr	Cranfield University – SAP consultant		Mikecarr.rtcs@freeUK.com
Nuhu Hatibu	Cranfield University – SAP consultant		
William Stephens	Cranfield University – SAP consultant	Silsoe, Bedford MK45 4DT, UK	w.stephens@cranfield.ac.uk
Damian R. Salla	DARAJ Magazine	Box 1887, Moshi	damianlinktz@hotmail.com
Phares Kinyawa	Directorate of Research and Development, MAFS	Ministry of Agriculture and Food Security, DSM	drd@ud.co.tz
Otmar L. Mbepera	Farmer	Box 10, Mbinga	
Godfrey Makonganya	Isayula Co-op Union	Box 402, Mbozi	
Gabriel E. Kagaruki	JUDEA/ farmer	Box 1526, Bukoba	Judea-tz@twiga.com
Edward K Sannda	Kilimanjaro Coffee Co	Box 2606, Arusha	kcc@habari.co.tz
Leonard M Kimati	Kilimanjaro Native Cooperative Union	Box 3022, Moshi	
J.M. Mbogela	Kilimo	Box 94, Mbozi	
Sosthenes K Njunwa	Kilimo	Box 3, Tarime	
Donough J Mahon	M'ringa Estate	Box 34, Arusha	
Nick G Emmanuel	Maruku Estate	Box 52, Moshi	
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Annex 7 : Terms of Reference

CONSULTANCY TO DEVELOP STRATEGIC ACTION PLAN (SAP) FOR TANZANIA COFFEE RESEARCH INSTITUTE (TaCRI)

TERMS OF REFERENCE

INTRODUCTION

The Tanzania coffee stakeholders, recognising that research is the "salvation" of the industry ("UTAFITI NDIO UHAI WA ZAO LA KAHAWA"), have recently formed their own independent coffee research institute – the Tanzania Coffee Research Institute (TaCRI). The rationale behind this was that, the coffee stakeholders were not receiving technological packages from the then Lyamungu Agricultural Research and Training Institute (LARTI), which was perceived to be weak, ineffective and not responding to the needs of the restructured coffee industry.

TaCRI was incorporated in 2000 under the Companies Ordinance (CAP. 212) as a company limited by guarantee. TaCRI, with Head Office at Lyamungu, Moshi, (formerly LARTI) became legally constituted and operational in September 2001. TaCRI has sub-stations at Maruku (Lake Zone), Ugano and Mbimba (Southern Highlands Zone).

TaCRI is required to undertake research that is focused, relevant and result oriented. Major emphasis is in producing coffee varieties and hybrids that are resistant to CBD and CLR for distribution to growers with supporting work in soils and plant nutrition, agronomy, plant pathology, entomology and nematology, technology transfer and training and economics. TaCRI is thus geared for demand-led, participatory process of technology development and dissemination to increase coffee productivity and quality and lower costs of production to increase incomes and profits of coffee growers.

TaCRI is now in the process of identifying consultants to provide assistance in the development of its Strategic Action Plan (SAP**)** to provide technical input/advice to ensure a focused results-oriented Strategic Action Plan that is demand-led and market oriented.

OBJECTIVES

The objective of the SAP consultancy is to assist TaCRI in the formulation of the medium-term (3-5 years) R & D strategy in order to rejuvenate the Tanzania coffee industry through appropriate participatory technology development and dissemination.

The study is to develop a comprehensive, results oriented Strategic Action Plan with Annual Action Plans (Work plans) for TaCRI.

TASKS TO BE UNDERTAKEN

- Develop an Institute-wide holistic focused and prioritised Strategic Action Plan (SAP) including costing broken down to show specific tasks for each of the six research and extension departments using the logical framework approach (to be attached as annex).

- Develop Annual Action Plans for each of the six departments mentioned above with budgets for 2002/2003 to 2006/2007. The consultants shall describe the goals (wider, longer-term objectives) to which the departments mean to contribute and specific outputs of the departments. They shall be specified in what they contain, how much to be achieved, where and by what deadline, and for whom, resources required and at what cost. It should be shown that achievements of these objectives will result in the availability to farmers of improved coffee cultivars that are resistant to pests and diseases and, especially for Arabica coffee, improved cultivars resistant to CBD & CLR. The expected departmental results (outputs) which are needed to accomplish their objectives shall be specified and quantified with their potential impact in reducing costs of production and improve quality and therefore incomes.
- Planned departmental activities and components shall be described and the inputs specified.
- Design a management information system for TaCRI.
- Recommend appropriate IT system for TaCRI in support of its R & D activities
- Recommend capacity building programs for TaCRI, identify and specify in detail resources required by TaCRI in order to successfully implement the SAP to achieve identified results.
- Recommend an appropriate and effective research organisation to achieve the intended results.
- Identify credible partners among government, the private sector, non-government organisation, community based groups, regional and international networks and organisations and advanced research institutes focusing on expanded partnership and collaboration to achieve TaCRI goals and objectives.
- The consultant shall assess and recommend the extent to which the stakeholders are likely to participate actively in the whole process of technology development and dissemination.
- A summary of the expected total project costs, with an indicative spending profile by calendar year and the Tanzanian fiscal year shall be set out with the detailed estimates on which it is based in an annex.
- Project costs will be set out in constant prices ruling at the time of project preparations. In addition, the consultant shall calculate the local costs including an allowance for price increases. As far as these local costs are concerned an annual rate of inflation applicable at a time of consultancy shall be applicable.

METHODOLOGY

It is the Consultant's prerogative to develop an acceptable methodology and timetable for delivering the outputs specified here; but the following is suggested:

- Orientation, which will include meeting with stakeholders; reviewing and synthesising the following (and any other relevant) reports:
  - PriceWaterhouseCoopers. 2000. Drawing up a Staffing and Financing Plan for Institute of Coffee Research and Extension, MAFS/CMU-STABEX.
  - Agrisystems (Oversees) Ltd. 1998. Coffee Sector Strategy Study – 3 volumes.
  - MoA/CIRAD. 1994. Project Proposal for Coffee Research, 1994-2000.
  - Snoeck, J. et al. 1991. Report on Coffee Research and Coffee Cultivation in Tanzania.

- Wrigley, G. 1989. Study to identify coffee research priorities in Tanzania
- LARTI. 1988-2000. Annual Coffee Research Reports, Lyamungu.
- TaCRI seminar reports and minutes

- Facilitation of a 3 days workshop to define with relevant stakeholders the strategic plan using the logical framework approach
- Preparation of comprehensive, results oriented Strategic Action Plan with Annual Action Plans (Work plans)

OUTPUTS
The consultants will provide a strategic plan and two reports. The first progress reports shall cover the orientation phase. The first report setting out the activities, outputs, observation and recommendations shall be submitted at the end of the orientation period. The strategic plan and the final report will be presented at the end of the assignment. The final report shall follow the format of the progress report and shall in addition contain final conclusions and recommendations. The latter draft reports shall be submitted not later than two weeks before the end of the assignment.

EXPERTISE REQUIRED
It is the Consultant's prerogative to put together a Team that will deliver the outputs specified above. The Team to be under the leadership of a Senior Strategic Planner/Economist shall cover the following areas of expertise:

- Research planning and priority setting (preferably in coffee);
- Participatory project design;
- Workshop facilitation/moderation:
- Baseline studies, monitoring and impact assessment with reference to agricultural research;
- Partnership development and project development;
- Coffee crop research: preferred area of expertise is in plant breeding, agronomy or plant pathology, but must include extensive experience in one of the research thrusts of TaCRI: plant breeding, plant pathology, entomology/nematology, agronomy, economics;
- Participatory technology development and dissemination/extension;
- On-farm research;
- Research-extension-farmer linkages;
- Management Information Systems (MIS); and
- Information Technology.

All team members must have appropriate academic and/or professional qualifications and have extensive and demonstrated practical experience in their field(s) of expertise. The research specialist should be a scientist with a Ph.D. and long standing coffee research experience in the areas indicated.

DURATION
The consultancy is estimated to have a duration of approx. six to eight weeks and is expected to start not later than April 2002. It is estimated that a total of 80 man-days is required to execute the consultancy.

Terms of Reference: Completion and Presentation Phase

INTRODUCTION

During the period July – September 2002, Cranfield implemented a Service Contract to develop a Strategic Action Plan for TaCRI (Contract No. SER/STAB/TACRICO93/01).

Following submission and acceptance of the draft final report / Strategic Action Plan, Cranfield were requested by the EU Delegation, Tanzania, to undertake additional work to:

1. Visit the Mbimba Agricultural Research Station in Mbozi District to assess its value and potential as TaCRI substation serving the Southern Highlands;
2. Meet with key stakeholders in Dar es Salaam, including the Ministry of Agriculture and Food Security and the EU, to consider issues arising from the draft SAP;
3. Meet with the Director General Meteorological Department to agree protocol for meteorological data collection and reporting in principal coffee production areas;
4. Address further principal points raised by stakeholders at meeting to consider draft final report (Strategic Action Plan);
5. Support TaCRI staff in the development of detailed action plans/work programmes for each designated TaCRI Department (five), expanding on the logical frameworks incorporated in the draft final report (SAP);
6. Consider the need for external management support to TaCRI during its formative years;
7. Provide detailed costings for the work programmes/action plans; and
8. Incorporate the outputs of the above into a revised Strategic Action Plan and present to TaCRI Board of Directors.

It is proposed that the above outputs are delivered by the end of January 2003.

SCHEDULE OF INPUTS

Person	Location	No. days
Mike Carr	TZ UK	10 12
William Stephens	TZ UK	10 6
Herbert Van der Vossen	NL	2

Notes:

1. All dates include travel days

2. UK days are intended for preparation and for revisions to the report

REPORTING

The consultants will provide an updated strategic plan and a final report, to be presented at the end of the assignment, but no later than three weeks after completion of the field work.

An electronic version and a number of hard copies each of the reports are to be made available as follows:

TaCRI	6
NAO	2
Head of Delegation	2

Annex 8 : References

The references are listed in date order.

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25. Ng'homa, N. and Ndege, L.J., 2002. Report on organic coffee management training at Ibwera and Kachwezi primary cooperative societies in Kagera Region of Tanzania. Field note 146, Maruku Agricultural Research Institute, Bukoba.

26. TAGREF, 2002. Tanzania agriculture research endowment fund. Proposal to the Government of Tanzania.

27. The United Republic of Tanzania, 2002. Coffee Industry Act.