CONVERDS:
THE COLLABORATIVE NETWORK
FOR VEGETABLE RESEARCH AND DEVELOPMENT
IN THE SOUTHERN AFRICAN REGION

JOINT PROJECT PROPOSAL

Participating Countries:

- ANGOLA  
- MALAWI  
- TANZANIA
- BOTSWANA  
- MOZAMBIQUE  
- ZAMBIA
- LESOTTO  
- SWAZILAND  
- ZIMBABWE

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I. BACKGROUND

The Technical Advisory Committee (TAC) of the Consultative Group for International Agricultural Research (CGIAR) has recognized the importance of improving vegetable production in the developing tropical countries since the early 1970s. Since then, it has commissioned several studies to determine how vegetable research could be institutionalized on an international scale in the same manner that had been done for several of the world’s major commodities.

In 1975, TAC commissioned a vegetable research appraisal mission followed by a vegetable research formulation mission the next year. A proposal to establish the International Vegetable Research Institute for the Tropics (IVRIT) was examined by the CGIAR in 1979 but because of the lack of consensus and financial constraints this was not developed further. In its 1985 review of CGIAR priorities and future strategies, TAC assigned the highest priority to research on vegetables in any new CG venture for which resources could become available and reported in its May 1986 meeting that it considers vegetables as a neglected commodity in which considerable impact could be made in the short and medium terms.

A conference on "Research and Development of Vegetables in the Tropics" was organized by Winrock International Institute for Agricultural Development in January 1986, following which TAC, assisted by a Winrock staff member, Dr. A. Colin McClung, began working on a proposal to create the International Service for Vegetable Research (ISVER). The proposal advocated the development of regional vegetable research networks supported by a small but critical mass of qualified experts.

The CGIAR, in its 1988 mid-term meeting in Berlin, endorsed in principle the need for vegetable research but it left for future consideration a number of substantive issues including the specific role of the AVRDC (Asian Vegetable Research and Development Center) in the proposed networks. In the following year's mid-term meeting in Canberra, the Group decided that while substantive issues on internationalizing vegetable research are being resolved, as an interim action a proposal to establish an African vegetable research network should be developed for consideration by TAC and the CG in its October 1989 meeting.

The above interim measure conformed well with the policy decision of the member states of the Southern African Development Coordination Conference (SADCC) to accord highest priority to horticultural research, particularly on vegetables, giving a policy directive to its research arm, SACCAR (Southern African Centre for Cooperation in Agricultural Research and Training), to launch a regional research initiative on vegetables on a priority basis. In response to this directive, SACCAR took action preparing a proposal to establish a regional vegetable breeding unit.

The formulation of AVRDC's strategic agenda for the years 1990 and beyond coincided with the above events, in particular, with respect to the Center's intention to reach out into the African continent in its future development efforts. In an initial exploration of potential collaborators in its African efforts, the Director General of AVRDC sounded out in a letter to the Director of SACCAR if there is an interest to have AVRDC as its partner on vegetable research and development in the southern African region.

Following the CGIAR decision in the May 1988 Canberra meeting to initiate vegetable research activities in Africa, and given the interest of SADCC, the CG secretariat organized a project identification mission to Southern Africa involving SACCAR, AVRDC and ISNAR (International Service for National Agricultural Research) from August 22 to September 12, 1989. An indicative
The proposal was developed by this mission to establish a regional collaborative network for vegetable research and development (CONVERDS).

The proposal was taken up by a group of donors in the annual CG meeting in October 1989. Start-up funding was allocated by some donors to enable SACCAR and AVRDC to organize a regional consultation workshop aimed at reviewing the CONVERDS proposal and developing the final proposal for the regional networking initiative. This regional workshop was held in Arusha, Tanzania on July 9-13, 1990. Details of this consultation meeting, i.e. scope, goals, workshop mechanics, representation and summary of recommendations are given in Annex I.

The present proposal is the result of the above consultation workshop and represents a consensus of the SADCC NARS on what they wish to see the network do for the benefit of the region's vegetable farmers and consumers and how the region's vegetable researchers should collaborate in the true spirit of equal partnership.

II. CONVERDS: THE COLLABORATIVE NETWORK FOR VEGETABLE RESEARCH AND DEVELOPMENT IN THE SADCC REGION

Mandate

CONVERDS is a regional technical organization within the framework of SACCAR charged with coordinating and promoting vegetable research and development in the SADCC countries, especially fostering research partnership among the region's NARS so that the scarce resources available to generate new technology would be utilized efficiently. Its full meaning is "Collaborative Network for Vegetable Research and Development in the SADCC Region". The acronym "CONVERDS" was deliberately chosen because it sounds like "converge", the coming and working together of various elements towards a common goal.

Goal

The general goal of CONVERDS is to provide a regional framework for collaborative vegetable research and development to solve the pressing problems of vegetable production and utilization in the SADCC region.

Objectives

The specific objectives which shall be pursued by CONVERDS to attain its general goal are as follows:

- to facilitate the generation and adoption of improved technologies for selected vegetable crops, through collaborative research, information exchange and scientific consultations;

- to develop and/or upgrade, the technical proficiency of the vegetable researchers and technicians in the NARS, the ultimate goal being to build the critical mass of scientists capable of responding to the national and regional needs for sustained vegetable production;
• to establish ways and means for collaborative research partnership among the SADCC country members, to attain better and more efficient use of expertise, technologies and the scarce resources available for vegetable research and development in the region;

• to establish and strengthen the linkages for exchange and acquisition of relevant technologies developed by regional and international centers, or any other external sources of technology; and,

• to develop an information and diffusion network in the SADCC region which will facilitate the assembly and dissemination of technical information to and from the region's vegetable researchers and eventually to and from their clienteles, the extension workers and the vegetable growers.

Functions of the Network

CONVERDS shall have the following general functions:

• provide the forum and mechanisms for improving communication and rapid exchange of technology derived from research;

• through consultation, identify research needs, set their priorities and encourage the NARS of the region to focus on these problems;

• foster collaborative and complementing research and technical exchanges, always taking into account the institutional strengths, weaknesses and needs of member NARS;

• minimize duplication of efforts and enable the formation of complementing vegetable research units that are able to address the production and utilization problems at the national and regional levels;

• hold periodic network meetings, as one of the means for developing collaborative plans, evaluating results, and fostering exchange of information;

• identify training needs at various levels and set priorities according to the needs of the member NARS;

• provide financial and technical support to enable the NARS with lead roles on specific commodities and/or cross-commodity network activities to effectively discharge their responsibilities.

Governance and Management

Organization and structure. As a collaborative effort, CONVERDS will require the cooperation and full support of several institutions and individuals at the regional, national and project implementation levels. The organizational chart of CONVERDS is given in Annex II. As may be noted, CONVERDS will be comprised of several functional bodies with distinct management and technical obligations to the network.

Technical Advisory Panel (TAP). This is the highest level of governing authority for CONVERDS and essentially functions as an oversight committee. Initially, TAP is proposed to be
comprised of eight members as follows: Director of SACCAR, Director-General of the executing agency (or a designated representative), Directors of Research of the NARS (initially four DRs) which are actively participating in network research activities, one selected representative from the regional faculties of agriculture, and a donor representative(s). Each DR in TAP will serve as the direct link between CONVERDS and the agricultural authorities of the NARS which are actively engaged in network research. TAP will be chaired by the DR of the NARS where the network team is deployed by the executing agency.

The main functions of TAP shall be as follows:

- To set policy and ratify the strategic plan of the network.
- To appoint the members of the Steering Committee.
- To review and approve the annual work plan and budget of the network, as presented by the Steering Committee.
- To seek funding resources through SACCAR for executing additional regional activities relevant to the network other than those of the regular program.

It is proposed that TAP meet once a year, preferably held as an extension of the SACCAR’s Board meeting (all Directors of Research of SADCC’s NARS are members of the SACCAR Board) to minimize additional travel and time expenditures of TAP’s members.

Steering Committee. This is an executive-technical committee whose main function is to provide direction to, program, monitor and develop the strategic plan of the network; prepare the annual work program; liaise between the policy-making body (TAP) and the operational (implementing) units of the network.

The Steering Committee shall be made up of the following members:

- one representative from TAP who will serve as the chairman of the committee.
- national vegetable program leaders (initially four team leaders) from NARS which are actively participating in network research.
- a representative from a faculty of agriculture in the region.
- a representative from the executing agency (normally, the network coordinator acting on its behalf).
- a representative from the extension service of the host country and invited observers from the private seed sector and training institutions.

The Steering Committee shall have a free mandate to invite any resource person it deems important in the conduct of its activities. It shall meet at least once a year (twice, if necessary) to review and help develop the annual plan of network activities, by consolidating the national and regional priorities.
Other important functions of Steering Committee shall be:

• to carry out for TAP, through delegated authority, executive functions in order to speed up the execution of network activities.

• to evaluate and assess new initiatives in collaborative research, training and information exchange.

Executing Agency. It is proposed that the Asian Vegetable Research and Development Center (hereafter referred to as AVRDC), an organization with long and valuable experience in the field of vegetable research, be designated as the executing agency of CONVERDS. As the executing agency, AVRDC is expected to provide the scientific, training and information resource base for the network. AVRDC will be an active partner in the network through the coordinator and the team of specialists who will work with their national counterparts.

The specific responsibilities of AVRDC shall be as follows:

• fiscal management of the network.

• deployment of a qualified team of experts composed of specialists in crucial areas of research to complement the NARS research as they gradually build their critical mass of technical staff.

• coordination of the network activities (through the network coordinator) including training, study tours, workshops, regional information build-up, etc.

• provision of genetic materials and other technologies for evaluation and adoption by the network.

• provision of an important venue for training of the NARS personnel on vegetable research and production methodologies.

• provision of liaison service with other specialized centers, institutions, universities and other external sources of knowledge deemed relevant to the objectives of the network.

• provision of technical backstop service for the network's research and training needs.

Network Coordinator. The network coordinator shall be mainly responsible for the overall coordination and execution of the network activities. In addition, the coordinator shall help provide scientific guidance, as well as serve as liaison between the Steering Committee and the implementing units of the network. The coordinator shall be contracted on a full time basis and shall be responsible to TAP with respect to general network responsibilities and to AVRDC in terms of the scientific and technical performance. The coordinator should be a well respected scientist with ample experience in the execution and management of research programs. The coordinator shall also take part in the execution of research activities, especially during the initial years of the project, until such time that the demands of coordination function become too heavy for him/her to continue to do so.
The functions of the coordinator, subject to any rules drawn up by TAP, include the following:

- to act as secretary of the Steering Committee.

- to formulate, in consultation with the NARS’ vegetable program leaders, the network’s annual program and budget.

- to supervise, monitor and evaluate the regional activities of the network.

- to supervise, with the assistance of SACCAR administrative officer, the program budget execution and insure efficient financial management in accordance with the budget allocated for the activities of CONVERDS.

- to provide the scientific and technical liaison with AVRDC, as well as, with other agencies or institutions of regional and international nature.

- to draw up the network’s strategic plan in collaboration with the NARS vegetable research program leaders acting in consultation with the key vegetable researchers in the NARS and the network’s expert team.

To accomplish the above functions, the coordinator will be assisted by a team of specialists. This team shall work full time in supporting specific research and development activities where expertise is still inadequate in the region or requires supplementary efforts.

The duties of the specialists shall be:

- in a close partnership with the coordinator, to plan, program and execute the activities of the network along with their national counterparts.

- to support and carry out activities aimed to improve the skill and expertise of their counterparts.

- to serve as a link with other external sources of knowledge in specific areas of his/her expertise.

Implementing Units. The NARS vegetable research program or its equivalent shall form the central core for the implementation of CONVERDS’ activities. The network will operate taking into account the mechanisms already established within the NARS, in terms of their organizational structures such as: the national coordinating committee in vegetable research in Tanzania; the Zambian vegetable research team in Zambia; the horticulture research institute in Zimbabwe; and in Botswana, the national vegetable research unit.

Each country with leadership role in the network will appoint a CONVERDS research leader (member of the Steering Committee), who will continue to function as a NARS country employee, but who, in addition, will take on regional responsibilities on behalf of the network. It is recognized that these additional responsibilities will make important regional demands on the appointed scientists; in such cases, CONVERDS will provide support services so that the leader can carry effectively out his/her national and regional tasks. In addition, it has been recommended and later ratified by the delegates that the NARS which has been vested the lead role for a particular commodity should be initially backed up by a specialist on that crop.
The duties and responsibilities of the CONVERDS research leaders within the regional network will include:

- to provide leadership and serve as the focal point of coordination for collaborative research and/or other network activities specifically assigned to his/her country.

- to design and formulate the annual work program and budget thereof with the cooperation of his/her fellow network researchers and the assistance of the network coordinator and the team of specialists.

- to collaborate with other country research leaders in carrying out the regional activities of the network.

- to maintain effective liaison among the vegetable researchers of the region, as well as with AVRDC and the specialists.

- to advise the coordinator on matters related to the research and activities undertaken on behalf of and for CONVERDS.

- to report on the results obtained as a part of their regional activities.

Operational Relationships

The national agricultural research systems actively participating in the network are the basic implementing units for collaborative research. A national vegetable program leader entrusted with research responsibilities for a specific crop, for example, will be the focal point for all network activities related to that crop. Expatriate specialists deployed by the executing agency will work closely with their national counterparts within the respective national research systems. The lead country for a specific commodity and/or activity is expected to collaborate with the other countries assigned different commodities and/or activities.

Legal, Political and Logistic Support

SACCAR, the research arm of SADCC, shall provide the legal and political umbrella for CONVERDS. SACCAR's main task will be to facilitate the provision of support services and functions as may be necessary in order to assist the coordinator, the team specialists, and the NARS leaders in the design, planning, monitoring and implementation of the network's program.

The responsibilities of SADCC/SACCAR will be as follows:

- to serve as a base for the governing body (TAP) of the network.

- to participate through representatives in the oversight committee (TAP) and the executive/technical committee (Steering Committee) in the overall planning, programming, budgeting and monitoring of the network.
• to draw up the memorandum of understanding (MOU) among all parties involved, i.e. SACCAR, AVRDC, NARS, to establish the network and enable its effective functioning.

• to provide assistance for obtaining donor support where required.

• to secure, in close interaction with AVRDC, the coordinator, and NARS, the overall political support of the regional network activities, particularly workshops, seminars and other activities which will help promote the rapid and continuous interchange and utilization of scientific and technical information in the SADCC region.

Administration and Funding Mechanisms

The network, according to its mandate, does away with the concept of independent research by the network specialists. Instead the team will engage in joint research with the vegetable research units in the NARS.

Such an arrangement and the fact that CONVERDS is a new regional approach to technical cooperation among different organizational elements (SACCAR; AVRDC; Southern African NARS; and donors) make imperative that the administration and, in particular, the funding and disbursement mechanisms be flexible, easy to carry out, and non-bureaucratic.

As CONVERDS will be partly autonomous of SACCAR in the sense that all its strategic decisions rest on TAP, the administration of funds shall be charged to an institutional element of the network which is vested with adequate experience to meet the fiscal management standards of the donors.

AVRDC is the network member which bears the infrastructure, expertise and credentials to administer the network's financial resources and is thus vested with this responsibility.

AVRDC, will, as a result, fulfill a dual role within the regional framework, i.e. as a technical resource base and as a fiscal administrator. It will receive the funds directly from the donors and disburse them according to the network's annual budget approved by TAP. AVRDC shall organize the proper account and auditing procedures, as well as submit the required accounting reports to the donor(s), as the case may be.

The director and the financial officer of SACCAR shall act as the administrative counterparts of AVRDC in terms of the mechanisms and procedures for the disbursement of the approved operational budget of the network.

The disbursement of approved budget for network operations shall be done through an "operating fund" to be handled by the financial officer of SACCAR, who in turn, shall insure that the financial resources are received in timely fashion by the all implementing units of the network, including the network team, through the network coordinator.

The use of a "revolving fund" under the responsibility of the network coordinator, is proposed to provide him/her and the team of specialists with sufficient latitude to operate; in such a case, the coordinator shall be accountable to the finance officer of SACCAR.

Salary and other benefits for all internationally recruited specialists and consultants, as well as acquisition of equipment and vehicles on behalf of the network, shall be directly handled by AVRDC.
Expected Output of CONVERDS

CONVERDS is to be viewed as an organization which will, out of necessity and design, evolve in stages, but with clear objectives to insure positive contributions in the short- to medium-term bases.

In the short term, the following results are expected from the initial activities of the network:

- sound assessment and priority setting for vegetable research and development at the national and regional levels;
- formulation of strategic technical and institutional approaches aimed towards resolving the major constraints of the vegetable industry in the SADCC region;
- establishment of a framework for research partnership among SADCC countries and with external technology sources such as AVRDC and other institutions engaged in vegetable research.

In the medium to long term bases, the expected accomplishments of CONVERDS are as follows:

- generation of concrete research findings in the form of improved cultivars, proper cultural practices, good quality seeds and others, for use by the region's vegetable growers;
- development of a nucleus of vegetable researchers in SADCC's NARS with improved capacity for research and interacting vigorously with each other and with researchers within and outside the SADCC region;
- promotion of centers of excellence in horticultural training (both at diploma and professional degree levels) in the SADCC region with an enhanced capacity to continually develop professional horticulturists, eventually to achieve the required critical mass of technical people in the NARS and in the region necessary to generate new technology;
- development of a center of leadership in vegetable research in the SADCC region to perform the future role of coordinating the activities of CONVERDS after its devolution from the external executing agency, and finally;
- placement of a long-lasting framework for collaboration in vegetable research in the SADCC region, with strong linkages among the member NARS and with other regional and international institutes, and serving as an excellent model of research partnership for the developing regions of the world.
III. RESEARCH AND DEVELOPMENT PRIORITIES OF CONVERDS

The SADCC NARS unanimously agreed during the regional consultation meeting in Arusha, Tanzania to conduct a number of network-based activities which are considered strategically important and which serve the common interests of all member countries of CONVERDS. Broadly speaking, these activities fall under three major areas—research, training and information.

Given the present scarcity of technical manpower in the region, the SADCC NARS recommended a gradual systematic build-up of the network, starting at the outset only with the most critical research and development programs, and utilizing at this time the resources of the NARS with comparative advantage in vegetable research who are asked to assume lead roles in the network. Initially, the network members recommended the deployment of a team of vegetable experts in the region, consisting of three experts based at HORTI-Tengeru in Arusha, Tanzania (identified by the SADCC NARS as the base for the network’s secretariat) and three other specialists to be based with the NARS assigned leading roles in vegetable research for the network. Together, this team constitutes the network’s coordinating unit. As the network members develop strength and gain experience, and as resources become available, the priorities will be reviewed and expanded to distribute responsibility and broaden participation more equitably among the NARS.

Priority Vegetables for Network Research

As a first step, the SADCC NARS agreed to confine the network research on a few strategically important vegetable species. Prioritization of vegetable species within the national systems based on popularity, consumption and extent of local production led to the identification of a few strategically important commodities.

The species that the NARS delegates agreed unanimously to consider for network research are as follows:

TOMATO, ONION, CABBAGE and INDIGENOUS VEGETABLES (the last considered as a group to include mainly native species such as amaranths, Corchorus, African eggplant, Cleome, etc)

Tomato is very easily the most popular vegetable in the SADCC region. It is popularly grown and consistently cited by every NARS among the most important vegetables in their national research agenda. ¹

Onions and cabbages are also prominently cited as vegetable species with great potential for the SADCC countries. ² Like tomato, these vegetables are invariably included in the NARS’ list of priority species.


The indigenous vegetables were chosen by the SADCC NARS for network research based on a number of considerations—nutritional contribution to the local diet; important role in food security; minimal production inputs; familiarity to most people, especially in the rural areas; and, local seed production possibilities. Furthermore, the indigenous vegetables have long been a part of the region’s cultural heritage.

Priority Problem Areas for Network Research

The network members considered two general problem areas within which priorities for research on selected network commodities need to be confined. These general areas are: a) Genetic Resources and Enhancements; and, b) Production Systems and Component Technologies.

The priority areas of research in each network commodity for each of the above general areas are given in the research component x commodity matrix of Table 1 below:

Table 1. Recommended research activities of CONVERDS on the network’s priority vegetable species

<table>
<thead>
<tr>
<th>Tomato</th>
<th>Cabbage</th>
<th>Onion</th>
<th>Indigenous vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Genetic Resources and Enhancements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Survey and exploration</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Collection*</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3. Germplasm characterization</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Cultivar evaluation</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5. Utilization</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>II. Production Systems &amp; Component Technologies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Cultural practices</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2. Plant protection</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3. Home gardens</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>4. Seed production</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5. Postharvest technology</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6. Socioeconomics</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

* = high priority; - = low priority (or absence of activity in some cases)
* Includes the collection of local landraces as well as improved modern-day cultivars for evaluation
Of the above research activities, some of the most important on genetic resources and enhancements that are planned to be conducted at the earliest possible time by the network are as follows:

- Exploration/survey of the local production of indigenous vegetables and prioritization of network research to the most important species.
- Collection of the local landraces of the priority commodities for maintenance, characterization, evaluation and utilization.
- Performance trials of introduced and local varieties especially of the conventional vegetables such as tomatoes, onions and cabbages.

The exploration, survey and collection of local germplasm will be carried out in close collaboration with the IBPGR’s regional office and the SADCC Regional Gene Bank (see Recommendation No. 18 in Annex I).

The lack of appropriate varieties has been a general problem of the region’s NARS so much so that one of the possible projects recommended under the horticultural development program in the region was the establishment of a regional vegetable research station charged with the task of developing good genetic materials and producing good quality seeds. It was recognized that the introduction, evaluation and adoption of advanced breeding lines will probably have the most immediate impact in improving the productivity of the network’s conventional vegetables (tomatoes, onions and cabbages). Advanced genetic materials that are high yielding, adapted to high temperatures and resistant to diseases are available at AVRDC and from other sources and could be immediately useful to the region. Thus, the introduction of improved germplasm will be a key activity of the network.

Among the components considered under the general area of production systems and component technologies, consensus among the SADCC NARS indicated that the most pressing needs are studies in the field of management practices and seed production. Under management practices, studies on plant protection methods to control harmful pests and diseases will have the highest priority. In particular, the transfer and adoption of technologies such as the integrated pest management (IPM) from centers such as AVRDC, promise to have an immediate and significant impact on the productivity and quality of vegetables in the SADCC region.

It was recognized that home gardens provide inexpensive and readily accessible supply of vegetables to low income families. A special effort needs to be launched so that home gardens, in particular the role of women therein in production and nutrition, is further promoted and enhanced. This will have to relate especially with the indigenous vegetable initiative of the network.

Postharvest losses in vegetables are very high in all countries including those of SADCC. The network will associate itself and take advantage of the strong regional program on horticultural postharvest handling and processing in Southeast Asia where essentially the same commodities are handled under fairly similar conditions.
Lead Countries for Network-based Research.

Consideration of the relative strength, resources and interests, and on-going research programs on network-mandated vegetable species among the SADCC NARS led to the following division of responsibilities on commodity research:

MALAWI-cabbage; TANZANIA-indigenous vegetables; ZAMBIA-onion; and, ZIMBABWE-tomato.

Consensus of opinion among the delegates during the Arusha workshop and from previous interviews of the region's researchers by the project identification mission clearly indicate the comparative advantage of Malawi in its research on leafy vegetables. Cabbage, among the leafy vegetables, is featured prominently in its research achievements.3

Tanzania's research agenda indicate the relative importance it places on the indigenous vegetables in the country.4 The 1989 project identification mission identified a number of already on-going research activities on indigenous vegetables in Tanzania, ranging from production and marketing studies; agronomy and genetic resources.

Onions have seed production problems that need to be addressed by the network on behalf of its members. Zambia has comparative strength in the area of seed production research among the lead NARS and considers onion among its priority vegetables.4,5

While tomato is invariably important in every SADCC NARS, the relative strength of Zimbabwe in cultivar improvement research4,6 with emphasis on climatic adaptability makes it a suitable choice by the SADCC NARS to take the lead on network research for this crop. Of particular importance is its research experience in the area of adapting tomatoes to the hot and humid subtropical conditions at Chidrezi.

Training Needs and Priorities

The lack of trained professionals in horticulture and the absence of a critical mass of researchers in each of the NARS was considered a primary constraint which the network should immediately address. All the countries represented expressed the need for BSc, MSc and PhD training but in addition, Malawi, Lesotho, and Swaziland felt that they still needed support at the diploma level.


The member countries agreed that the following types of training activities should be supported by the network:

* **Diploma Course.** This is a two-year course for general agriculture certificate holders as well as for high school graduates. This is available in some of the SADCC countries, one of which is the Tanzanian course at HORTI-Tengeru.

* **Intensive Course on Vegetable Production.** Horticultural research and extension officers in the region for the most part possess general BSc in agriculture backgrounds. This intensive 5-6 month course will provide them the additional training necessary to improve their competence in vegetable crops. The participants will go through at least one cropping cycle and will cover subject matter areas from sowing to marketing and processing. As a first step, this will be extremely useful in immediately upgrading the research skills of the present cadre of NARS vegetable researchers. Although designed to admit BSc holders, outstanding diploma holders and those with adequate experiences may also be admitted. In the medium term, this course will serve as a regional course for vegetable subject matter specialists, junior researchers and teachers of vocational agriculture. At some point in the future, the network will assist some of the NARS to organize similar national courses in order to broaden the opportunities for manpower development.

* **BSc and MSc in Horticulture.** Professional training in horticulture at the graduate level was deemed as better done at this time at the SADCC regional level. Moreover, the NARS delegates favored that in-depth specialization in the field of horticulture be conducted at the MSc level rather than start outright at the BSc level in order to avoid the narrowness of work scope of the BSc degree holders who are normally expected to handle non-horticultural crops as well in the field. However, horticultural training in the present BSc general agriculture curricula could be augmented by specific courses in the production of vegetables, fruits and ornamentals for which teachers possessing MScs in horticulture will be needed.

* **Special Research Skills Training.** In addition to the above, selected researchers from the NARS are envisaged to be sent for special research skills training. These will vary from one week to a few months research internship at AVRDC, other IARCs, developed country laboratories and at the network headquarters in HORTI-Tengeru. Examples of special skills training include culture/rearing of pathogens and insects and their predators and parasites; virus-indexing and cleaning-up of vegetable planting materials; quality and sensory evaluation of vegetables; management of germplasm; use of RFLPs and other biotechnology tools.
The NARS delegates identified and recommended to develop two centers of training in horticulture for the SADCC region as follows:

* **HORTI-Tengeru/Tanzania.** As this institute has the basic infrastructures for training and is currently already offering a diploma course in horticulture, CONVERDS' will use this center for the short-term intensive course in vegetable production and for the network-supported diploma course in horticulture.

* **University of Zimbabwe.** The NARS representatives recommended that the professional training in horticulture be conducted at the University of Zimbabwe.

**Information Needs and Priorities**

The delegates unanimously agreed and recommended to develop a vegetable information database for the SADCC region. Initially, the most pressing need is to compile the vegetable research information in the region, have them documented and distributed to the region's vegetable researchers. The development of this information base shall be among the immediate concerns of the network. Later, this database will be expanded to include the internationally available research information databases, including those that are already available at AVRDC. Other types of information services, e.g. newsletters, short communications, bibliographies, bulletins, manuals, videos and tapes etc., will be produced by the network coordinating unit for use by the horticultural research, teaching and extension services in the NARS.
IV. PROPOSAL FOR THE INITIAL FIVE-YEAR PROGRAM

The SADCC NARS agreed that a five-year project period is the minimum requirement at the outset to set the network in place, enable it to engage significantly on a number of strategic activities, and prepare the NARS to take more active roles in the future coordination and implementation of network-mandated tasks. The research and development activities that the participating NARS of CONVERDS put high priority on during the start-up five-year period (please refer to Section III. Research and Development Activities of CONVERDS) will require the resources as shown in Table 2. The major line items of this five-year budget are further elaborated below.

Expatriate Staff. At this stage, the network ideally will have six expatriate staff to establish a critical mass of experts to back up the network. They should represent the following disciplines: breeding, production and management, entomology, pathology socio-economics, and information cum training. The plan is to have three based at the network coordinating unit headquarters in Tanzania and one each at the three other lead NARS. One of the six will concurrently serve as Network Coordinator. The staff cost is based on a figure of $100,000 per person per year, covering benefits as follows: basic salary, post-differential, housing allowance, retirement and insurance, educational allowance, home leave and other support. An estimated 5% increase in personnel cost each year is projected. The full team is expected to be in place during the second year.

Capital Outlay. The network activities will be grafted into the NARS implementing units and this will enable the use of already existing facilities. The project will provide a modest amount to put up new complementing facilities and/or improve existing ones.

The network coordinating unit at HORTI-Tengeru will be able to share the existing training, laboratory, field and farm shop facilities of the Institute. However, the coordinating unit will need to develop a 20-hectare area of land as the existing developed experimental land is fully utilized for research and training activities. The land is available at the station but needs to be developed. Moreover, the coordinating unit needs additional training rooms and offices to supplement the existing facilities used by the on-going national diploma training activities.

Each of the lead NARS will likewise be provided with supplemental capital funds for experimental land improvement and renovation of works areas/offices as deemed necessary. The breakdown of capital improvements is as follows:

At HORTI-Tengeru

| Improvement of 20-ha land—levelling, irrigation, fencing and road improvement | $ 60,000 |
| Training classrooms cum offices | $260,000 |
| Workshed | $ 19,000 |

At three other lead NARS

| Land improvement and renovation of work areas and offices at $50,000 each | $150,000 |

**GRAND TOTAL** | **$429,000**
Table 2. Projected five-year budget requirements of CONVERDS

<table>
<thead>
<tr>
<th>BUDGET ITEM</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
<th>TOTAL</th>
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<tr>
<td>Expatriate staff cost</td>
<td>$300,000</td>
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<td>$30,000</td>
<td>$30,000</td>
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<td>$375,000</td>
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<td>$50,000</td>
<td>-</td>
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<td>-</td>
<td>$100,000</td>
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<td>$145,000</td>
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<td><strong>ANNUAL TOTAL</strong></td>
<td>$1,658,000</td>
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<td>$1,660,000</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>$8,240,000</td>
</tr>
</tbody>
</table>
Equipment. The major equipment needs of the network include the following:

- one (1) minibus for transport of trainees, three (3) four-wheel drive jeeps, one (1) pick-up truck and three sedans for the network coordinating unit;
- three (3) four-wheel drive jeeps and three sedans, for the three lead NARS, for use in daily operations;
- one (1) medium-size tractor and three (3) hand tractors for the network coordinating unit;
- one computer/printer each for the participating NARS for use in the information link-up
- assorted laboratory and field equipment for the network coordinating unit and lead NARS.

Operational Support of Network Activities. This amount is intended to augment the national research budgets and directly support those activities initiated in behalf of the network. It is estimated at US $60,000 per specialist and is broken down as follows:

- National support staff (project basis):
  - Two (2) research assistants and six (6) support personnel ................................................................. $35,000
  - Travel, supplies, communication, and miscellaneous expenses ................................................................. $25,000
  - TOTAL (per specialist per annum) ................................................................. $60,000

In addition, $15,000 per annum is included in the operational budget to be used in establishing the network’s information base and other essential communication activities.

External Review and Evaluation. Management and technical review of the network is programmed during the second year, to be repeated in the fourth year as preparation for developing its future plans after the five-year project period ends. The item includes travel, allowance (hotel and food), and honorarium (for invited experts) for a six-man external review team composed of representatives from SACCAR, AVRDC, NARS and invited expert(s). Interested donor representatives may also be invited. The review is programmed as a three-week activity, including the preparation of report and recommendations.

Annual Programming Meeting. The principal mechanism for coordination are the annual programming meetings. The meetings will involve the network coordinator, his/her team of specialists, and the national research leaders from NARS who have lead roles in network research. The budget item includes: transportation cost, travel allowance (hotel and food), and other meeting costs. The meeting is regularly scheduled as a two-day event and will be on a rotational basis among the actively participating NARS.

Regional Technical Review and Planning. Regional workshops are programmed in the third and fifth years. These workshops are to involve participants from various agencies as follows: SACCAR, AVRDC, the network coordinating unit, selected NARS delegates (three per NARS from the technical and policy sectors) from all the SADCC countries, and other interested organizations. These workshops are projected as one-week exercises. The estimated budget includes
transportation, travel allowance (hotel and food), publication fees and other essential services. Representation in the fifth year workshop may be extended to delegates from donor organizations and to experts invited for the purpose of overall review of the network activities and future planning. This review shall take into account the evaluation report and recommendations prepared by the external review panel in the fourth year.

Training. The network strongly emphasizes the upgrading of the NARS' capacity for research and development through degree-oriented and/or special skills training of personnel of the member countries. Budget estimates for this activity were calculated as follows:

- **Diploma training in horticulture.** This is a two-year course in horticulture proposed to be undertaken at HORTI-Tengeru which already offers it, mainly to Tanzanian nationals. A total of two students per NARS for the SADCC countries which expressed interest in diploma training are expected to complete this course during the five-year project period. The budget for this type of training is based on estimated living allowance of $210 per person per month and a round-trip airfare of $600.

- **Intensive vegetable production course.** This is an intensive five-month course on vegetable production to be offered at HORTI-Tengeru by the network coordinating unit, assisted by the institute's staff and other resource persons. The course will be offered mainly to BSc holders but could possibly be extended to diploma holders, if the need is identified. The budget item is based on an estimated living allowance of $210 per scholar per month and a round-trip airfare within the SADCC region of $600. At least 100 trainees from the research and extension services of SADCC are expected to undergo this once-a-year course over the five-year period.

- **Special research skills training.** This is a five-month research internship and/or vegetable production course at AVRDC and other suitable centers of training to upgrade the competence of the NARS staff in the network. Cost estimate includes the following: round-trip travel cost of $2,500 per scholar; training fee (including tuition, book allowance, board and lodging, insurance, etc) of $1,500 per month. Thirty-four (34) researchers from the SADCC NARS are envisaged to complete this program.

- **Advanced degree training in horticulture.** The budget for this professional level training (MSc level) at the University of Zimbabwe is estimated at $5,000 per student per year (includes living allowance, stipend, tuition, school supplies, etc). Transportation cost is estimated at $600 round-trip within the SADCC region. The projected training duration is two-years. After the completion of the two-year MSc course, each scholar will be sent on a 5-month special training program in a specialized laboratory abroad before resuming his/her duties in the NARS. Arrangements will be made with appropriate institutions in Europe and elsewhere where this “finishing up” training will be undertaken. At the end of the five-year project period, it is expected that thirty (30) professional horticulturists (MSc level) would have been added to the vegetable research cadre in SADCC. Provisions for PhD training will be incorporated in the network probably in the next phase after the doctoral program at the University of Zimbabwe is properly established.

V. ANNEXES

ANNEX I. REGIONAL CONSULTATION WORKSHOP
ANNEX II. ORGANIZATIONAL CHART OF CONVERDS
ANNEX III. LIST OF PARTICIPANTS TO THE CONSULTATION WORKSHOP
Date and Venue

The regional consultation workshop among SADCC NARS was held at Arusha, Tanzania on July 9-13, 1990.

Scope & Nature

The workshop provided contributed country papers on national agricultural policies and the current status of vegetable research and development in the national programs of the SADCC (Southern African Development Coordination Conference) region. As well, papers on home gardening, seed production, integrated pest management, and postharvest technology of vegetables were presented to provide an adequate background on substantive issues which affect the development of the vegetable industry. Together, these papers set the tone for the working group discussions and in-depth review of "CONVERDS", a comprehensive proposal for collaborative vegetable research and development in the SADCC region, and paved the way for developing appropriate recommendations and endorsing in principle the proposed collaborative network.

CONVERDS, which stands for "Collaborative Network on Vegetable Research and Development in the SADCC Region", was conceived by a joint project identification mission mounted by the CGIAR Secretariat (Consultative Group on International Agricultural Research), SACCAR (Southern African Center for Cooperation in Agricultural Research and Training), AVRDC (Asian Vegetable Research and Development Center) and ISNAR (International Service for National Agricultural Research) in August 1989. It is an attempt to band together the national agricultural research systems (NARS) into a cohesive and singularly effective group which addresses the strategic research and development needs on vegetable of the region as a whole. Individually, the NARS do not have the critical mass of resources to address the most important problems of their vegetable industries; together with the other NARS, however, their pooled resources would enable them to pay profound attention to a number of research and development issues that are strategically common to all NARS in the region.

The CONVERDS proposal was reviewed by a group of donors during the October 1989 CGIAR meeting, following which, funds were allocated for the regional consultation workshop by GTZ (the German Agency for Technical Cooperation), by the Government of France, and by CIDA (Canadian International Development Agency).

Goals

The consultation workshop had the following goals:

- to update the state of the art in vegetable research and development in the SADCC region;
- to gain a comprehensive understanding of the priorities in vegetable research and development of the member states of SADCC and of the region as a whole;
- to bring together vegetable researchers, educators, extension specialists and policy makers and secure a broad consensus on the priorities and mechanisms for collaborative research and development which will mutually benefit all member states of SADCC, and,
• to review the indicative proposal to establish CONVERDS, and develop a final proposal for a regional collaborative effort on vegetable research and development which will merit the support of the participating national governments and the donor community.

Participants

Each country in the SADCC region was represented by a delegation made up of one representative each from the following: policy-making body (also the head of the delegation); leading agricultural research institute; leading agricultural college or university; and, a key figure or official from the national extension service.

In addition, various organizations were represented in the workshop as follows: donor agencies; international agricultural research centers and other research and/or development agencies active in the SADCC region; private and non-government organizations; and, key resource persons invited to present background papers on a number of substantive issues affecting the vegetable industry.

The list of participants to the regional consultation workshop is given separately in Annex III.

Mechanics of Group Discussions

The participants were divided into two working groups. Group I dealt with the issues of national priorities--vegetable species, researchable problem areas, production systems, environments for vegetable production, and needs for human resource development and information. Group II tackled the issues of network modalities--objectives, functions or responsibilities, institutional arrangements, mechanisms of collaboration, management functions, linkages, role and contribution of the participating NARS, role and contribution of regional and international institutions, needs to deploy a small team of regionally and internationally recruited scientists based at one of the NARS and other related issues.

Summary of Recommendations

The recommendations developed by the participating NARS of CONVERDS during the workshop are summarized below.

A. Priority Vegetable Species. The priority vegetables identified by each member country, arranged in the order of importance, were as follows:

- Botswana--cabbage, tomato, onion, mustards
- Lesotho--cabbage, tomato, onion, carrots
- Malawi--tomato, onion, cabbage, indigenous vegetables*, mustards
- Swaziland--tomato, onion, carrot, cabbage
- Tanzania--indigenous vegetables, tomato, onion, cabbage
- Zambia--tomato, mustards, onion, cabbage
- Zimbabwe--tomato, onion, cabbage, mustards

Note: Delegates from Angola and Mozambique were not able to participate and thus, their priorities could not be reflected here.

* Indigenous vegetables include native species often growing as wild weeds such as amaranths, Corchorus, African eggplants, Cleome, etc.
The criteria used in determining priorities are consumption and local production. Accordingly, the above species may be arranged as follows in their order of importance in SADCC region: tomato, cabbage, onion, mustards, and indigenous vegetables. Based on the above exercise, the working groups agreed on the following recommendations:

**Recommendation No. 1.** The vegetables or group of vegetables for network consideration initially should include the following: tomato, onion, cabbage and indigenous vegetables.

**Recommendation No. 2.** Lead countries for each of the above network commodities are as follows: Malawi--cabbage; Tanzania--indigenous vegetables; Zambia--onion; and, Zimbabwe--tomato.

**B. Priority Researchable Problems.** Discussions on the most appropriate activities of the network for the priority species led to the identification of two general research areas, namely: 1) Genetic Resources and Enhancements; and, 2) Production Systems and Component Technologies.

**Recommendation No. 3.** Under each of these general problem categories, specific research components were identified for which individual crop priorities were made (see Table 1 of the main proposal for details of these components).

**Recommendation No. 4.** Indigenous vegetables are a diverse group. In view of this, it was further recommended that some prioritization in the species to be handled by the network will have to be done. This could come about after a preliminary survey and assessment of NARS activities on this group, their priorities, production figures and other relevant data.

**C. Priority Production Systems.** The environments identified by each NARS as important areas to which research should be directed by the network were as follows:

- Botswana--lowland
- Malawi--lowland and highland
- Tanzania--lowland and highland
- Zimbabwe--lowland and highland.

**Recommendation No. 5.** The SADCC NARS unanimously agreed that the vegetable technology packages to be generated by the network should focus on both home gardens and market gardens, although the recommendation should be applicable to any size of farm holdings practised by the majority of vegetable growers.

**D. Training Needs of the SADCC NARS.** Human resource development at various levels were identified by each NARS as necessary to enhance their capacities to carry out vegetable research in the years to come. These needs, as expressed by country representatives, are as follows:

- Botswana--BSc to PhD
- Malawi--diploma to PhD
- Tanzania--BSc to PhD
- Zimbabwe--BSc to PhD
- Lesotho--diploma to PhD
- Swaziland--diploma to PhD
- Zambia--BSc to PhD
Recommendation No. 6. Based on the training needs expressed by the member NARS, it was recommended that the network provide for the training opportunities listed below. Moreover, it was recommended that the first two courses be organized at the HORTI-Tengeru institute in Tanzania where there is an ongoing national training program, where some training facilities are already available and where the network coordinating unit will be based.

- **Diploma course.** This is a two-year course for general agriculture certificate holders as well as high school graduates. For reasons already stated above, this type of training will be conducted at HORTI-Tengeru.

- **Intensive 5-6 month course on vegetable production.** This type of training is preferably for general BSc degree holders but could be made open to diploma holders as well if the needs are identified. The aim of this training course is to enhance the capability of the general agriculturists who currently undertake most of the horticultural activities in the region. The course will be designed for vegetable subject matter specialists, junior researchers and teachers of vocational agriculture.

- **Special research skills training.** This is a five-month research internship and/or vegetable production course at AVRDC and other suitable centers of training to upgrade the research competence of the NARS staff in the network in specific research techniques and methodologies.

- **Advanced degree training in horticulture.** This type of degree training is an in-depth specialization in the field of horticulture at the MSc level at the University of Zimbabwe, identified by the SADCC as the regional center for professional training in horticulture.

Recommendation No. 7. The delegates recommended that degree training should start immediately since these types of training take long to complete. In addition, the delegates felt preparatory activities on training which can be initiated by CONVERDS could possibly involve the immediate identification of current research officers in the NARS for intensive research training at AVRDC.

Recommendation No. 8. It was likewise proposed that the above training programs be open to both the public and private sectors. However, candidates from the latter will have to be nominated by the national research leaders representing the NARS in the network; otherwise, the private sponsors will have to bear the training cost.

E. Information Needs of the SADCC NARS. The participants generally agreed that initially a database of vegetable research activities in the region should be compiled by the network secretariat. Later, this database could be expanded to include internationally available research information databases, including those that are already available at AVRDC.

Recommendation No. 9. In order to assist in collecting information available in the region, it was recommended that scientists in each country should be commissioned to prepare reviews of all past and present research reports on vegetables for inclusion in the network’s database. Bibliographies, abstracts, newsletter, etc. are to be published by the network secretariat for dissemination to the region’s vegetable researchers.
F. Objectives, Structures, Functions and Governance. All participating countries of SADCC unanimously resolved to participate in the proposed vegetable research network thus concurring, in principle, with the third objective of CONVERDS, i.e. "to establish ways and means for collaborative research partnership among the SADCC country members and to attain a better and efficient use of expertise, technologies and the scarce resources available for vegetable research and development in the region".

There was unanimous agreement on the general functions of the network as earlier proposed but two more general functions were recommended for inclusion.

Recommendation No. 10. The delegates recommended that the network should have the following functions:

- provide the forum and mechanisms for improving communication and rapid exchange of technology derived from research;
- identify research needs, set priorities and bring the appropriate NARS of the region to focus on these problems;
- foster collaborative and complementing research and technical exchanges, always taking into account the institutional strengths and weaknesses of the component NARS;
- minimize duplication of efforts and enable the formation of complementing vegetable research units that are able to address the production and utilization problems at the national and regional levels;
- hold periodic network meetings as one of the means for developing collaborative plans, evaluating results, and fostering exchange of information;
- provide financial and technical support to enable the NARS given the lead roles in specific commodity or cross-commodity areas to effectively discharge their enhanced responsibilities;
- identify training needs at various levels and set priorities according to the needs of the component NARS.

Recommendation No. 11. The delegates recommended that each lead NARS with specific commodity responsibility for the network to be backed up initially by an expatriate specialist in those particular crops.

Recommendation No. 12. The delegates resolved to adopt the networking mode of collaboration among the participating NARS.

The functions of SAVRECO (originally proposed as the oversight committee of the network) in the proposed organizational chart of CONVERDS were generally accepted by the delegates with the exception of the second function (see Recommendation No. 13 below).

Recommendation No. 13. The delegates recommended to delete the second function, "to review and confirm the selection of the network coordinator and network’s expert team by the executing agency", the same having been identified as a prerogative of the SACCAR Board.
Recommendation No. 14. It was proposed and accepted that the name SAVRECO be changed to TAP (Technical Advisory Panel) and ETCO, the executive and technical entity, to Steering Committee, in order that CONVERDS will conform with the existing system of SACCAR regional networks.

Recommendation No. 15. In addition, it was recommended and accepted that the membership in the Steering Committee be extended to include the following:

- a representative from the extension services of the host country and invited observers from the seed company as well as training institutions

There was also general agreement that the Steering Committee should have a free mandate to invite any resource person(s) in its meetings if they are considered important in the conduct of the committee’s activities.

The section on “Network Coordination” in the CONVERDS proposal was generally approved with minor modification on the first responsibilities of the IMPLEMENTING UNITS. This first responsibility should now read “to provide the leadership and to serve as the focal point for the collaborative research and/or other activities specifically assigned to a country”.

Recommendation No. 16. As noted earlier, it was recommended and accepted by the delegates that HORTI-Tengeru of Tanzania should host the expert team to be deployed by AVRDC, the executing agency, and that the five-month intensive training on vegetable production and the two-year diploma course in horticulture be conducted at the same site. The host country, Tanzania, was noted by the delegates to have the necessary quarantine facilities for importing and exporting plant materials to and from the member countries of CONVERDS.

Recommendation No. 17. The delegates recommended that SACCAR prepare an agreement or memorandum of understanding (MOU) between the NARS hosting the expert team and the executing agency on behalf of the expert team to be deployed there by the latter.

On linkages between the team of experts and the NARS, it was agreed that the national research leaders representing the NARS in CONVERDS should be responsible to the network coordinator.

Recommendation No. 18. On other issues, the delegates recommended that the network establish a strong relationship with the SADCC Regional Gene Bank (SRGB) in Zambia, and with IBPGR, in order to enable it to utilize the SRGB’s existing gene bank facilities, and to promote the collection, characterization, conservation and utilization of the region’s indigenous vegetable genetic resources. The participants also unanimously agreed that the region’s genetic materials should be sent and preserved at AVRDC as a backup collection.
ANNEX II

PROPOSED ORGANIZATIONAL CHART OF CONVERDS

AVRDC
Executing Agency

SADCC/SACCAR

Technical Advisory Panel

Steering Committee

Network Coordinator & Team of Experts

Implementing Units

NARS Team Leader
Commodity or Activity A

NARS Team Leader
Commodity or Activity B

NARS Team Leader
Commodity or Activity C

NARS Research Team

NARS Research Team

NARS Research Team

Collaborative/coordination relationship
Line of functional responsibility/accountability
Representation
ANNEX III

List of Participants

Botswana

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