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REPORT AND RECOMMENDATION OF THE PRESIDENT

TO THE EXECUTIVE BOARD ON PROPOSED

TECHNICAL ASSISTANCE GRANTS

FOR

AGRICULTURAL RESEARCH AND TRAINING

BY

CGIAR-SUPPORTED INTERNATIONAL CENTRES



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ABBREVIATIONS AND ACRONYMS

ACIAR	Australian Centre for International Research
CFC	Common Fund for Commodities
CGIAR	Consultative Group on International Agricultural Research
CSIRO	Commonwealth Scientific and Industrial Research Organisation
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IER	Institut d'économie rurale (Rural Development Institute)
ILRI	International Livestock Research Institute
INERA	Institut de l'environnement et de recherches agricoles (Institute for the Environment and Agricultural Research)
INRAN	Institut national de recherches agronomiques du Niger (National Institute for Agricultural Research)
IPM	Integrated pest management
LEGOFTEN	Legume on-farm trial and nurseries
NARS	National agricultural research systems
NARES	National agricultural research and extension system
NGO	Non-governmental organization
NLO	National liaison officers
ROCARS	Réseau ouest et centre africain de recherche sur le sorgho (West and Central Africa Sorghum Research Network)
ROCAFREMI	Réseau ouest et centre africain de recherche sur le mil (West and Central Africa Millet Research Network)
SPC	Sustainable endoparasite control
TA	Technical assistance



**REPORT AND RECOMMENDATION OF THE PRESIDENT OF IFAD
TO THE EXECUTIVE BOARD ON PROPOSED TECHNICAL ASSISTANCE GRANTS
FOR AGRICULTURAL RESEARCH AND TRAINING BY
CGIAR-SUPPORTED INTERNATIONAL CENTRES**

I submit the following Report and Recommendation on two proposed technical assistance (TA) grants for agricultural research and training to CGIAR-supported international centres in the amount of USD 2 375 000.

PART I - INTRODUCTION

1. The present report recommends the provision of IFAD support to the research and training programmes of two CGIAR-supported international centres: the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Livestock Research Institute (ILRI).
2. A description of the TA grants for approval by the Executive Board is contained in the annexes to this report:
 - I. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT): Farmer Participatory Testing of Technologies to Increase Sorghum and Pearl Millet Production in the Sahel
 - II. International Livestock Research Institute (ILRI): Development and Testing of an Integrated Approach to the Control of Gastro-Intestinal Parasites in Small Ruminants in South and South-East Asia
3. The objectives and content of these applied research programmes are in line with the evolving strategic objectives of IFAD and the policy and criteria of its TA grant programme for agricultural research and training.
4. The strategic objectives of IFAD's support for technology development relate to: (a) IFAD's target groups and their household food-security strategies, specifically in remote and marginalized agro-ecological areas; (b) technologies that build on traditional knowledge systems, are gender-responsive, and enhance and diversify the productive potential of resource-poor farming systems by improving productivity and addressing production bottlenecks; (c) access to productive assets (land and water, financial services, labour and technology, including indigenous technology) and sustainable and productive management of such resources; (d) a policy framework that provides the rural poor with an incentive to reach higher levels of productivity, thereby reducing their dependence on transfers; and (e) an institutional framework within which formal and informal, public and private-sector, local and national institutions provide services to the economically vulnerable, according to their comparative advantage. Within this framework, IFAD also intends to develop commodity-based approaches to rural poverty alleviation, specifically targeting those items that are produced and consumed by the rural poor. Finally, the establishment of a consolidated network for knowledge-gathering and dissemination will enhance the Fund's capacity to establish long-term strategic



linkages with its development partners and to multiply the effect of its agricultural research and training programme.

5. The TA grants proposed in this document respond to the foregoing strategic objectives. The ICRISAT programme seeks specifically to respond to strategic objectives (a), (b) and (c) to the extent that it addresses smallholder resource-poor farmers in the Sahel, helping them gain access to good quality seeds of improved varieties of sorghum and pearl millet, and developing sound management techniques for soil restoration, control of insect pests and diseases. The ILRI programme aims specifically at responding to strategic objectives (a), (b) and (e), among others, in that it seeks to directly benefit smallholders in Asia through developing an integrated approach to the control of gastro-intestinal parasites in small ruminants. This will be achieved by technology development and diffusion of existing control options and the development and testing of new integrated approaches to worm control.

PART II - RECOMMENDATION

6. I recommend that the Executive Board approve the proposed technical assistance grants in terms of the following resolution:

RESOLVED: that the Fund, in order to finance, in part, the Farmer Participatory Testing of Technologies to Increase Sorghum and Pearl Millet Production in the Sahel, shall make a grant not exceeding one million five hundred thousand United States dollars (USD 1 500 000) to the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented to the Executive Board in this Report and Recommendation of the President.

FURTHER RESOLVED: that the Fund, in order to finance, in part, the Development and Testing of an Integrated Approach to the Control of Gastro-Intestinal Parasites in Small Ruminants in South and South-East Asia, shall make a grant not exceeding eight hundred and seventy five thousand United States dollars (USD 875 000) to the International Livestock Research Institute (ILRI) upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented to the Executive Board in this Report and Recommendation of the President.

Fawzi H. Al-Sultan
President



**INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID
TROPICS (ICRISAT): FARMER PARTICIPATORY TESTING OF
TECHNOLOGIES TO INCREASE SORGHUM AND PEARL MILLET
PRODUCTION IN THE SAHEL**

I. BACKGROUND AND RATIONALE

1. Sorghum and pearl millet are staple food crops across the sahelian agro-ecological belt of West and Central Africa and are grown by millions of resource-poor, mainly subsistence, farmers. Both crops are genetically adapted to the harsh drought-prone sahelian environment and are capable of producing grain and fodder where few other crops can even survive. Besides providing food for humans and feed for livestock, sorghum and millet stems are used for a wide range of purposes, including: the construction of walls, fences and thatches; and production of brooms, mats, baskets, fish-traps, sun shades, etc. They are also used as fuel and as a soil additive to improve its fertility. Some varieties of sorghum can be “malted” to produce a nutritious foodstuff for infants and for use in bakery products. Malted sorghum can be also used in small-scale traditional beer production, an important income-earning activity for village women.

2. Population pressure and declining soil fertility in the Sahel is having a negative impact on sorghum and millet production. Higher productivity, pest resistance and better grain quality is needed. Some improved varieties exist but their use is very limited as they are either unknown to the farmers or their seeds are unavailable. In some countries, especially Ghana and Nigeria, surplus sorghum is available, over and above family food requirements. In such circumstances, “dual purpose” sorghum varieties, suitable for both food and malting, could be grown; and surplus grain could be sold for malting to generate cash income. The use of locally-produced sorghum-malt is developing quickly in both Ghana and Nigeria but processors find it difficult to obtain reliable quantities of suitable grain.

3. The main focus of the proposed programme is to increase production of staple food, thereby contributing to alleviating rural hunger, and to remove the main constraints on widespread adoption of improved varieties by strengthening seed multiplication and distribution systems. Farmers will be encouraged and supported to establish sustainable farmer-participatory seed production systems. The programme will target 100 food and income-deficit villages in the Sahel, following the successful approach developed by ICRISAT in Southern Africa where suitable varieties and improved agronomic practices were identified and developed in conjunction with farmers. Several new sorghum and pearl millet varieties were adopted, resulting in increased grain production. In a number of cases, sustainable non-governmental organization (NGO)-led on-farm seed production systems were developed to become a valuable part of the national seed production system; whereas, in others, private seed companies took up the task of multiplying new varieties. ICRISAT has had similar success in India with the IFAD-funded Legume On-Farm Trial and Nurseries Project (LEGOFTEN) under TA grant number 181-ICRISAT (On-farm Research on Groundnut, Pigeonpea, Chickpea and Transfer of Technology to Semi-Arid Tropics (SAT) Farmers of India).



II. THE PROPOSED PROGRAMME

4. In conjunction with the national agricultural research and extension system (NARES) of the participating countries – Burkina Faso, Ghana, Mali, Niger and Nigeria – ICRISAT will undertake the programme of on-farm technology development and testing. Farmers, extension agents, researchers and policy makers will be involved in the preparation of annual work programmes and in implementation and evaluation. Governmental agencies and NGOs will participate. By using this approach, the technologies developed under these conditions are expected to have a better chance of adoption by the end-users.

5. As a result of previous crop improvement work by ICRISAT and other organizations, some improved sorghum and millet varieties suitable to different regions of the Sahel already exist, many with farmer-preferred characteristics such as early maturing, drought tolerance and pest and disease resistance. The programme will:

- develop and refine technology options to improve sorghum and millet. (Options here include soil management practices such as tillage, application of fertility enhancements such as rock phosphate, farmyard manure and crop residues, intercropping and rotation with legumes and use of optimal plant densities);
- develop and test integrated pest management (IPM) procedures to combat, inter alia, stem borers (sorghum), downy mildew (millet) and *Striga* infestation;
- test and validate existing and new varieties of millet and sorghum using farmer-participatory techniques; and
- multiply significant quantities of seed of varieties most likely to be adopted by farmers.

6. The programme will work in close coordination with the Common Fund for Commodities (CFC)-supported sorghum malt project that focuses on Ghana and Nigeria, and address issues related to the commercial use of sorghum grain in all participating countries to prepare for crop surpluses. Ghana and Nigeria make significant imports of malt, and the programme will provide an income-earning opportunity both for farmers in areas of surplus (through the sale of sorghum grain) and for village women (through the production of malt for biscuits, bakery products and traditional beer).

III. EXPECTED OUTPUTS/EXPECTED BENEFITS

7. The major outputs of the programme will include:

- (a) Increased yields of sorghum and pearl millet in Burkina Faso, Ghana, Mali, Niger and Nigeria.
- (b) Improved food production, reduced hunger in target villages and less dry-season migration of small farm households to cities.
- (c) Greater availability of improved variety seed (including malting sorghums in Ghana and Nigeria) produced by farmers.
- (d) A cadre of farmers trained in farmer-based pilot seed production systems for sorghum and pearl millet initiated and assessed.



- (e) Pilot private seed enterprises initiated.
- (f) Greater awareness among farmers of the importance of both seed quality and production constraints such as pests, poor soil fertility and land degradation.
- (g) Greater awareness on the part of sorghum and millet researchers and extension workers with regard to consumer preferences.
- (h) Increased use by farmers of technology innovations, such as improved seed, IPM and better agronomic practices.
- (i) Village women in Ghana and Nigeria trained in malting techniques for locally-grown sorghum (CFC parallel project).
- (j) Reduced imports of malt by Ghana and Nigeria (CFC parallel project).

IV. IMPLEMENTATION ARRANGEMENTS

8. The programme will be implemented by ICRISAT in partnership with the national agricultural research institutions of Burkina Faso (Institute for the Environment and Agricultural Research (INERA)), Ghana (Savanna Agricultural Research Institute), Mali (Rural Development Institute (IER)), Niger (National Institute for Agricultural Research (INRAN)) and Nigeria (Institute for Agricultural Research). ICRISAT's Natural Resource Management Programme, which operates out of its sahelian base at Sadore, Niger, will be responsible for supervising implementation. Joint planning workshops will be conducted with the national research institutions. The millet and sorghum networks (West and Central Africa Millet Research Network (ROCAFREMI) and West and Central African Sorghum Research Network (ROCARS)) have agreed to become involved. Winrock International, Sasakawa Global 2000, World Vision, CARE International and other NGOs will play a key role by assisting in the selection of villages and research sites and in the implementation of key aspects of the programme - especially on-farm seed production, of which a number of NGOs have considerable experience in the target countries.

9. A national team leader will oversee and coordinate the programme within each participating country. Reports prepared at the national level will be consolidated by ICRISAT into periodic programme progress reports and a final report. To initiate the programme, the institute will carry out baseline surveys to assemble socio-economic and agronomic information on production and use of sorghum and millet. Planning and training workshops will be organized at an early stage. In partnership with farmers and NGOs, ICRISAT will organize and conduct agronomy trials in farmers' fields. Farmers will be intimately involved in the selection of varieties to be multiplied and in screening new lines in order that their socio-cultural preferences and agronomic considerations have a bearing on the selection and bulking of material. Breeder and foundation seed will be multiplied in conjunction with the national research institutes. Finally, farmers in conjunction with NGOs will be trained in village-scale seed production, using a participatory approach.

10. The programme will have a steering committee (including representatives of IFAD, ICRISAT, participating national research institutions, the sorghum and millet networks, selected NGOs and representatives of both farmers and processors), which will review workplans and budgets, evaluate work in progress and provide general guidance. Progress will be monitored on the basis of indicators agreed at the stakeholders' workshop. These will include: (a) number of farmers participating; (b) number of trials; (c) number of varieties adopted by farmers; (d) area of seed plots at different stages of multiplication (breeder seed, foundation seed, on-farm seed plots); and (e) yields of millet



ANNEX I

and sorghum (of both food and malting types) at the farm and village levels (compared with yields at the time of the baseline survey). The programme will be reviewed at mid-term and again during the final year. Staff of IFAD's West and Central Africa Division will be involved in supervising the programme and will participate in steering committee meetings to ensure that close linkages are developed with IFAD-financed development projects in the sahel region at the outset of the programme. The programme will be implemented over a period of three years.

11. A comprehensive stakeholders' workshop, attended by 58 individuals, was held in February 1999 at ICRISAT's sahelian base near Niamey, Niger. The programme was planned using the logframe approach, and roles and responsibilities at the local, national and regional levels were agreed.

V. INDICATIVE PROGRAMME COSTS AND FINANCING

12. The programme will be cofinanced by ICRISAT and the participating research institutions from the five target countries. Total programme costs will amount to USD 3 000 000, of which IFAD will contribute 50%. Some 52% of IFAD's contribution will be distributed to participating research institutions (with ICRISAT administering the funds under a memoranda of understanding) and 48% will be provided directly to ICRISAT, the latter financing selected activities by the sorghum and millet networks and NGOs (selected/agreed by national research institutions) from IFAD funds. As agreed with CFC, some USD 305 000 of IFAD's funds will be directed to supporting the CFC sorghum malt project in the form of parallel financing. Of this USD 80 000 will be used for Ghana and another USD 80 000 for Nigeria. ICRISAT will use the balance of USD 145 000 mainly to support NGO-supervised on-farm seed multiplication and production. NARES funding will be mainly in kind.

ESTIMATED COSTS AND FINANCING PLAN (THREE YEARS) (USD)

Cost Category	ICRISAT	NARES	IFAD	Total
Research staff	420 000	300 000	507 000	1 227 000
Operational costs	250 000	250 000	366 000	866 000
Travel	30 000	20 000	67 000	117 000
Equipment and supplies	80 000	50 000	77 000	207 000
Training, workshops, exchanges and publicity	50 000	30 000	229 000	309 000
Other costs and contingencies	10 000	10 000	66 000	86 000
Overheads	-	-	188 000	188 000
Total	840 000	660 000	1 500 000	3 000 000



**INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI):
DEVELOPMENT AND TESTING OF AN INTEGRATED APPROACH TO THE
CONTROL OF GASTRO-INTESTINAL PARASITES IN SMALL RUMINANTS IN
SOUTH AND SOUTH-EAST ASIA**

I. BACKGROUND

1. Approximately 10% and 29% of the world's population of sheep and goats, respectively, are to be found in South-East Asia. Haemonchosis, a disease caused by blood-sucking stomach worms, has been identified as the most serious endoparasite constraint on small ruminant production in South-East Asia. It is difficult to combat this disease as conventional parasite control with drugs is affected by increased anthelmintic resistance. Modern control methods, e.g. an investigation of host genetic resistance, are promising tools but benefits will take some time to realize.

2. In 1998, a research project, jointly funded by the Australian Centre for International Research (ACIAR) and the International Livestock Research Institute (ILRI), was initiated in The Philippines. The major focus of the project was to adapt an assay for anthelmintic resistance to tropical conditions and investigate the use of resistant genotypes of sheep and goats as contributors to sustainable endoparasite control (SPC) strategies. The proposed programme, which builds on the ACIAR/ILRI project, is expected to expand activities to countries not currently involved in ACIAR/ILRI research in order to develop integrated strategies for endoparasite control for adoption by smallholder farmers. The proportion of sheep and goats produced by smallholders is very high in the ten countries participating in the proposed programme, and ranges from 50% to 99% (between 95% and 99% in five of the countries).

II. RATIONALE/RELEVANCE TO IFAD

3. The only way to combat the increasing resistance in anthelmintic parasites of sheep and goats is to give greater attention to the development of integrated SPC strategies. SPCs include a strategic anthelmintic treatment, genetically-resistant hosts, improved management, vaccines, supplementary feeding and biological control. Development of integrated control strategies requires knowledge of the individual and combined effects of alternative control options. Experiments have shown that improved nutrition (supplementation with high protein diets) amplifies the level of genetic resistance. More comprehensive experiments are required to investigate interactions among different control options.

4. Rapid recognition of anthelmintic resistance at an early stage in its development is the key to the formulation of recommendations for better use of anthelmintics, e.g. strategic drenching. This ensures also that quarantine recommendations can be timely developed to minimize the spread of resistant parasites to areas that have not yet been infected.

5. The proposed four-year programme will allow for establishment of a concrete outreach mechanism/methodology for delivery and application of the SPC package of options to smallholders. It will also allow for measurement of attitudinal change before and after programme training and awareness activities; provide two full annual cycles of small ruminant production and parasite control; measurement of parasite impact and epidemiology; and full analysis and assessment of programme impact.



ANNEX II

6. Nine ongoing IFAD projects have been identified to benefit from the programme. The technology to be developed aims at providing self-reliance and increased prosperity for those using small ruminants as sources of security and income, primarily smallholders and landless poor. The proposed programme targets 10 countries in the region, but the nature of helminth parasitism is that the parasites and the solutions that can be devised to solve the problems they cause to small ruminant production are common to production systems in all countries. Sheep and goat production is often in the hands of women and children for whom there are direct benefits: increased milk and meat production for home consumption, and greater disposable income and capital security.

III. THE PROPOSED PROGRAMME

7. In collaboration with national agricultural research systems (NARS) and other partners, ILRI will carry out an assessment of available, but scattered and fragmented, information on methods of use and application of anthelmintics, management practices and nutrition as a means of controlling worm parasites in small ruminants. Some of the SPC options will be tested in the field as best-bet practices. These will include ex ante economic impact studies involving trials on the economic effects of infection in sheep and goats and on-farm evaluation of SPC systems. Information from these studies will be provided as an ongoing updatable resource for extension services to be directly disseminated to farmers and smallholders.

8. A diagnostic survey of the causes of continued mortality of goats, such as seasonal variations in feed, poor hygiene and management, and diseases, including internal parasites in particular, will be undertaken at the outset of the programme. The commencement of activities in Nepal will be contingent upon the results of the multi-site survey showing that internal parasites constitute a major cause of mortality and affect the productivity and livelihood of smallholders.

9. The programme will concentrate on the development and testing of SPC strategies in tree-livestock and crop-livestock production systems in the rainfed ecological zones of South-East Asia. Available SPCs are: genetically-resistant hosts, rotational grazing systems, strategic nutritional supplementation (high protein supplements and anti-parasitic feed compounds, e.g. tannins), strategic drenching, improved hygiene in intensive pen-feeding systems and biological control. On-farm research will be carried out at a number of benchmark sites that are representative of the different agro-ecological zones and farming systems in South-East Asia and therefore have broad recommendation domains.

10. The second group of activities will include the adaptation and improvement of an existing computer model for use by research and extension agencies in assessing worm control options in different agro-ecological zones and farming systems in the tropics. A computer model called WORMWORLD, developed in Australia to assess the impact of resistance to anthelmintics on the control of worm parasites on pasture-based systems, will be adapted to the requirements of animal husbandry in the target regions. A further objective will be to adapt the model to non-pasture-based systems.

11. At the benchmark sites, on-farm research will be accompanied by training of villagers in the various SPC options in order to develop a cadre of auxiliary extension workers, village vaccinators and veterinary auxiliaries, bearing in mind that a large number of beneficiaries will be poor rural women. Workshops, with a strong training component and planning and review functions, will be held at the beginning and end of the programme. National liaison officers (NLOs) and NARS specialists will attend these workshops and take part in in-country assessments of needs and options for SPC strategies and their implementation. National workshops will be conducted with programme support.



12. **Assessment of impact.** An ex ante impact assessment has been undertaken of ILRI's current research on breeding for endoparasite resistance as part of sustainable parasite control strategies for African small ruminants (owned and raised mainly by poor smallholder farmers). The estimated present value of the breed characterization research is USD 52 million, with a rate of return of 42% and a benefit/cost ratio of 29:1. Actual returns are expected to be much higher, however, and for several reasons: the productivity increases in sub-Saharan Africa could be larger and more widespread; and this analysis accounts only for sheep in sub-Saharan Africa while the research should produce results applicable to sheep and goats in other tropical regions of the world. Similar arguments can be made for small ruminant production in Asia with similar rates of return, the major beneficiaries being smallholder farmers and consumers who mostly constitute the rural poor.

13. **Proposed ex-ante and ex-post assessment.** It is proposed to further assess the impact of nematode parasites on sheep and goat production by initiating on-farm studies on the long-term effects of infection. In addition, two further strategies will be followed: (a) to measure the impact of control interventions in different smallholder farming systems – for example, by comparing production of stock tethered on a rotational system with others grazed by conventional tethering; and (b) to evaluate changes in the attitudes of farmers, extensionists, educators and their students as one of the key objectives of the proposed programme. A survey of attitudes will be undertaken in major production systems and countries at the start of the programme (as part of the consultative and diagnostic process) and repeated in the fourth year. Success will be measured by both increased awareness of SPC principles and adoption of improved practices. Both assessments will be carried in programme years (PYs) 1 and 4 and will involve assistance from ILRI and NARS scientists specialized in these fields. Special attention will be paid to impact of control interventions through local capacity developed for delivery and application.

IV. EXPECTED OUTPUTS/EXPECTED BENEFITS

14. The major outputs of the programme are expected to include:

- Increased awareness and skills among national parasite control staff and smallholders with regard to sustainable approaches and options for worm control by PY 3.
- A decision-support package appropriate to regional and in-country needs developed by PY 2.
- Computer model adapted and developed for the assessment of worm control options in the tropics by PY 1.
- SPC strategies developed, tested and implemented by PY 3.
- A nucleus of national staff trained in improved integrated control of helminths of sheep and goats, with capacity to undertake national training workshops by PY 3.
- Improved epidemiological information on small ruminant helminths in the region by PY 2.
- Established regional SPC network by PY 4.
- Stakeholders' completion workshop conducted, and impact assessed by end of PY 4.

**V. IMPLEMENTATION ARRANGEMENTS**

15. As implementing institution, ILRI will have overall responsibility for all components. An ILRI scientist based in The Philippines will act as programme coordinator and coordinate regional activities under the direction of the lead scientist based in Nairobi, Kenya. The programme will support a post-doctoral scientist recruited from the NARS in the region to assist the ILRI programme coordinator implement the programme. Potential participating countries are Cambodia, Fiji, Indonesia, Laos, Malaysia, Nepal, Papua New Guinea, Philippines, Thailand and Viet Nam, which will be represented by senior scientist/advisors on parasite control designated as NLOs. A steering committee comprising representatives of ACIAR, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for Australia, IFAD, ILRI, the NARS (NLOs) and other collaborators and donors (e.g. the Food and Agriculture Organization of the United Nations and the Electronic University) will help facilitate the legal, technical and organizational needs of the programme. A large proportion of the research will be undertaken by the NARS. Where possible and feasible, the programme will provide training for NARS scientists and extension workers.

16. A network of NARS scientists, extension workers and veterinary and animal science teachers already exists as a result of the sister SPC project, related ACIAR and ILRI projects in the region and bilateral contacts among the scientists involved. The ongoing SPC activities in Indonesia are on-farm, and involve the full participation of smallholder farmers in the design and implementation of research and the uptake of new technology.

17. A start-up workshop will be conducted in order clearly to define the mode of programme operation in each country and formalize establishment of linkages and production of feedback through existing extension and training programmes involving the NARS institutions with whom the programme will be working. Feedback will be taken both from national surveys of SPC practices and from the post-implementation workshop. In addition, most of the field research under this programme will be conducted directly with the smallholder farmers and feedback from them will be elicited through existing extension personnel and the NLOs.

VI. INDICATIVE PROGRAMME COSTS AND FINANCING PLAN

**COST TABLE
(USD)**

Item	IFAD	ILRI	ACIAR	NARS	CSIRO	Total
Scientific staff ¹	150 000	300 000	60 000	65 000 ¹	41 000	616 000
Consultants	80 000		20 000			100 000
Technical support staff (100% NARS)	75 000	75 000	11 500	20 000		181 500
Research expenses (100% NARS)	105 000	150 000	142 000			397 000
Capital equipment (100% NARS)	60 000		26 000	100 000		186 000
Travel and workshops (100% NARS)	105 000	30 000	112 000			247 000
Training and capacity-building	60 000					60 000
Programme coordination (100% NARS) ²	120 000 ²	150 000				270 000
Incremental administration and technical backstopping	120 000	125 000		100 000	165 000	510 000
Total	875 000	830 000	371 500	285 000	206 000	2 567 500

¹ Based on 10 steering committee members (25% of their time, one from each country) and 30 scientific specialists (15% of their time, three from each country). All the NARS budget constitutes in-kind contributions of people and facilities.

² Funds to support a NARS post-doctoral scientist.