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REPORT AND RECOMMENDATION OF THE PRESIDENT

TO THE EXECUTIVE BOARD ON PROPOSED

GRANTS

UNDER THE

GLOBAL/REGIONAL GRANTS WINDOW

TO

CGIAR-SUPPORTED INTERNATIONAL CENTRES

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS	iii
PART I – INTRODUCTION	1
PART II – RECOMMENDATION	2
ANNEXES	
I. INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS: COMMUNITY ACTION IN INTEGRATED AND MARKET-ORIENTED FEED-LIVESTOCK PRODUCTION IN CENTRAL AND SOUTH ASIA	3
II. INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS: GROWING OUT OF POVERTY: INTENSIFICATION OF SORGHUM AND MILLET SYSTEMS BY UNLOCKING THE POTENTIAL OF LOCAL BIODIVERSITY AND MARKET OPPORTUNITIES IN SEMI-ARID WEST AFRICA	11

ABBREVIATIONS AND ACRONYMS

CGIAR	Consultative Group on International Agricultural Research
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICRISAT	International Crops Research Institute for the Semi-arid Tropics
NARS	national agricultural research system
TAG	technical assistance grant

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

I submit the following report and recommendation on two proposed grants for agricultural research and training to international centres supported by the Consultative Group on International Agricultural Research in the amount of USD 2.4 million.

PART I – INTRODUCTION

1. This report recommends the provision of IFAD support to the research and training programmes of the following international centres supported by the Consultative Group on International Agricultural Research (CGIAR): the International Center for Agricultural Research in the Dry Areas (ICARDA) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

2. The documents for the grants for approval by the Executive Board are contained in the annexes to this paper:

- (i) ICARDA: Community Action in Integrated and Market-Oriented Feed-Livestock Production in Central and South Asia
- (ii) ICRISAT: Growing Out of Poverty: Intensification of Sorghum and Millet Systems by Unlocking the Potential of Local Biodiversity and Market Opportunities in Semi-Arid West Africa

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 IFAD's grant programme.

4. The overarching strategic objectives that drive IFAD's policy for grant financing approved by the Executive Board in December 2003 are:

- (a) promoting pro-poor research on innovative approaches and technological options to enhance field-level impacts; and
- (b) building the pro-poor capacities of partner institutions, including community-based organizations and NGOs.

5. Deriving from these core objectives, the specific aims of IFAD's grant support relate to: (a) IFAD's target groups and their household food-security strategies, specifically in remote and marginalized agroecological 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 the 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 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.

6. The grants proposed in this document respond to the foregoing strategic objectives. The Programme for Community Action in Integrated and Market-Oriented Feed-Livestock Production in Central and South Asia responds to overarching strategic objectives (a) and (b) by promoting adaptive on-farm participatory research and innovative approaches in feed-livestock production and the building of capacities of the national agricultural research systems (NARSs), as well as promoting community-based actions. The programme also responds to two of the specific aims of IFAD's grant support, namely: (a) by focusing on small farm enterprises and resource-poor small ruminant producers and (b) by testing technologies and management options for improved feed-livestock production systems.

7. The Programme for Growing Out of Poverty: Intensification of Sorghum and Millet Systems by Unlocking the Potential of Local Biodiversity and Market Opportunities in Semi-Arid West Africa responds to two of the specific aims of IFAD's grant support: firstly, (b), in that it is supporting the development of technologies for the efficient utilization of locally adapted biodiversity to create improved crop varieties, combining increased productivity and adaptation to local conditions through close interaction and collaboration with farmers and their organizations; secondly, it responds to (e) by enhancing the marketing capacities and options of farmers and farmer organizations, with a special focus on seeds.

PART II – RECOMMENDATION

8. I recommend that the Executive Board approve the proposed grants in terms of the following resolutions:

RESOLVED: that the Fund, in order to finance, in part, the Programme for Community Action in Integrated and Market-Oriented Feed-Livestock Production in Central and South Asia, shall make a grant not exceeding one million two hundred thousand United States dollars (USD 1 200 000) to the International Center for Agricultural Research in the Dry Areas (ICARDA) for a three-year programme 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 Programme for Growing Out of Poverty: Intensification of Sorghum and Millet Systems by Unlocking the Potential of Local Biodiversity and Market Opportunities in Semi-Arid West Africa, shall make a grant not exceeding one million two hundred thousand United States dollars (USD 1 200 000) to the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) for a three-year programme 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.

Lennart Båge
President

**INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS:
COMMUNITY ACTION IN INTEGRATED AND MARKET-ORIENTED FEED-LIVESTOCK
PRODUCTION IN CENTRAL AND SOUTH ASIA**

I. BACKGROUND

1. Livestock plays an important role in the Central Asian agricultural economies. However, livestock production has been severely affected by the economic transition, which has resulted in the disruption of the Soviet markets for traditional products such as wool and pelts, the fragmentation of large production units into small and unproductive flocks and herds, the collapse of production support services and animal health control, a lack of technology transfer services and disruption of livestock research. Emerging small household enterprises are inexperienced in operating farm businesses and have no capital to implement new farm enterprises and appropriate technologies. Feed supplies have been disrupted; there is inadequate access to rangelands, and the production and conservation of forages are limited. The disaggregation of large herds into small herds and the inability of farmers to practise seasonal grazing have led to the overgrazing of areas near villages and the undergrazing of remote ranges, thereby increasing the reliance on cultivated fodder.

2. In Pakistan, livestock provides up to a third of household income for small and landless farmers, contributes more than a tenth to GDP and has tremendous and recognized potential in any strategy aimed at poverty reduction. The increasing population, combined with higher household incomes, is expected to generate a rise in the annual demand for livestock, milk and meat products by more than 50%. In both Central Asia and Pakistan, for livestock production to increase and to address increasing demand and for the rural poor to benefit from the process, there must be progress in the development of the livestock sector.

3. In 1999, ICARDA initiated a technical assistance programme – Technical Assistance Grant (TAG) 425 Integrated Feed-Livestock Production in the Steppes of Central Asia – that created an integrated adaptive research framework with the active participation of farmers and the direct involvement of NARSSs. The lessons learned from TAG 425 led to the identification of new priorities for further action, including: (a) the need for a community-based approach; (b) the development of farmer organizations to facilitate access to services (credit, marketing, etc.), collective resource management (such as joint grazing) and technology testing and adaptation; (c) fuller analysis of rural livelihoods; (d) identification of avenues for production diversification; and (e) community action for sustainable rangeland management.

II. RATIONALE/RELEVANCE FOR IFAD

4. The experience and knowledge gained from the proposed programme would be of direct benefit for IFAD's growing investment portfolio in Central and South Asia. Ongoing development projects such as those funded by IFAD offer a unique opportunity to link technological interventions to a market-driven research framework to improve the livelihoods of farmers.

5. IFAD is currently in the process of developing a new subregional strategy for its lending programme in Central Asia, and the programme will provide synergies with the new activities. IFAD has also recently assisted the Food and Agriculture Organization of the United Nations in preparing a thematic review of livestock issues in Pakistan. IFAD and ICARDA are already involved in the Strategic Partnership Agreement for the Implementation of the United Nations Convention to Combat Desertification in Central Asia. The Canadian International Development Agency has approved a grant for a community-based rangeland management project in the Kyrgyz Republic that was submitted by the Global Mechanism of the convention and will be implemented by the United Nations Development Programme in Kyrgyzstan within the framework of the strategic partnership agreement.

ANNEX I

The programme will be of direct relevance to and is expected to cooperate closely with the following IFAD-financed operations in Central Asia and Pakistan through the provision of technologies and improved practices for integrated feed-livestock production:

- Kyrgyzstan: I-473-KG Agricultural Support Services Project;
- pipeline projects, in particular in Tajikistan; and
- the proposed microfinance innovation and outreach programme in Pakistan.

III. THE PROPOSED PROGRAMME

6. The programme would capitalize on the experiences gained during TAG 425. It would consolidate research on promising options in Kazakhstan and Kyrgyzstan in Central Asia and expand activities to Tajikistan, initiate a new programme of research in Pakistan, develop knowledge sharing with other countries in South Asia, strengthen national research institutions and link with key development projects for the more rapid achievement of goals.

7. The programme aim is to improve the livelihoods of rural communities in Central and South Asia. The programme purpose is to develop and promote community-based actions to support productive and sustainable livestock systems, access to market opportunities and the sustainable management of the natural resource base in the region. The programme would focus on emerging small farm enterprises in countries of Central Asia and resource-poor livestock (small ruminant) producers in rainfed areas of Pakistan.

8. The programme would develop productivity enhancing and market-oriented technologies and community-based strategies for the management of integrated crop (fodder crop)-rangeland-livestock production systems that can be utilized in IFAD's community development and agricultural support services projects. The programme would focus on the community level, with the full participation of livestock producers, as well as national programme scientists. It would test available technologies and production options together with farmers, evaluate their impact on farmer livelihoods and assess the need for support services and institutions, including those governing common property (rangeland) access and management, so as to promote the adoption of these technologies.

9. The programme would function through two "ecoregional intervention nodes" supported by a regional network and a virtual centre of information. Node I would include Kazakhstan and Kyrgyzstan, where the focus would be on the new priorities emerging from TAG 425 and the consolidation of achievements. Node II would include the new participating countries of Tajikistan and Pakistan, where the focus would be on identifying constraints, defining priorities and transferring available technologies.

10. In Kazakhstan and Kyrgyzstan, based on the information and results produced in TAG 425, communities would be selected in representative pilot sites. In Tajikistan, initial work on the characterization of production systems, constraint analysis and the assessment of market opportunities – all vital to the design of appropriate technology development – would be needed before the selection of representative communities. It is expected that the advances made in Node I can then be rapidly transferred to Tajikistan for adaptive research and testing. In Pakistan, ICARDA is already implementing the applied research component of the IFAD Barani Village Development Project in north-west Punjab Province and has also been subcontracted by the Food and Agriculture Organization to implement the applied research component of a project funded in neighbouring Balochistan by the United States Agency for International Development, GCP-PAK/095/USA Food Security/Poverty Alleviation in Arid Agriculture Balochistan, pilot project phase. This takes a community approach and includes activities in rangeland and livestock (small ruminant) management. The proposed new IFAD programme would link with and build on these ongoing activities in Punjab and Balochistan. At the same time, the programme will develop new links with the proposed microfinance innovation and outreach programme, undertaking adaptive research with the

ANNEX I

beneficiaries and holding annual workshops with partner organizations of the microfinance innovation and outreach programme, the Balochistan project and the Barani Village Development Project to ensure learning linkages.

11. The programme would implement adaptive on-farm participatory research to promote community action in the development of integrated feed (fodder crop and rangeland) and livestock production systems. The community-based adaptive research would include:

(a) socio-economic assessments

- rapid rural appraisals and baseline surveys to select communities in each country;
- detailed surveys with farm households in each community to determine production practices and constraints;
- analysis of livelihoods and identification of potential options for improving rangeland-livestock-cropping systems;
- assessment of community-based institutional options: (i) for the common management of resource use and (ii) to capitalize on economies of scale in income generation (e.g. village-based production and processing enterprises); and
- assessment of policies regarding land tenure, property rights and marketing with a view to enabling the take-up of improved livelihood options.

(b) community action in the development of management options for feed-livestock systems, including:

- testing by communities of annual and perennial fodder species adapted to local conditions; and
- community action in re-establishing rotational grazing and access to remote ranges and in rehabilitating areas around the villages.

(c) community action in testing options for market orientation and the diversification of production, including options to increase sheep and goat productivity, improve the quality of livestock products and adding value through community-based processing to target market opportunities more effectively, with particular attention to income-generating options among women.

12. The programme would also develop a web-based information centre to support researchers, technicians, extension workers, producers and IFAD project managers and provide training for national scientists. Regional workshops on cross-cutting issues will be organized.

IV. EXPECTED OUTPUTS/EXPECTED BENEFITS

13. Expected results would include:

- analysis of livelihood determinants and production constraints and tested technologies and management options for improved feed-livestock production systems;
- recommendations regarding the appropriate policies and institutional support required to enable the take-up of production options;
- establishment of a virtual information centre that would facilitate regional exchanges of information; and
- successful training of national scientists in the use of appropriate approaches and tools.

14. The programme would benefit resource-poor small ruminant producers in Central and South Asia by enhancing rural incomes and livelihoods, thus contributing to agricultural growth. The programme would contribute to IFAD's medium-term strategic goal of improving the competitive

ANNEX I

capacity of small-scale rural producers and to IFAD's priority areas for livestock and range management.

15. The widespread adoption of the programme's technologies and community-based production or marketing enterprises would require support from microfinance and credit services and other institutional support services that are beyond the scope of this programme. Thus, the impact of the programme would be achieved through the linkages with IFAD's agricultural services support projects and other development projects in the region.

V. IMPLEMENTATION ARRANGEMENTS

16. ICARDA will be responsible for managing and coordinating the programme, including the responsibility for financial management and donor reporting. Technical support will be provided by ICARDA and collaborating institutions. ICARDA has a well-established regional programme in Central Asia, with a regional office in Tashkent, and already works closely with the national programmes of the Central Asian countries. In addition, ICARDA has country offices in Pakistan, which will facilitate the management of the expanded programme.

17. The programme will be led by a regional coordinator, ICARDA's senior livestock research scientist. A scientist will be posted in Central Asia as programme manager to oversee programme implementation. The programme manager will also be responsible for overseeing implementation in Pakistan via ICARDA's country offices there. In addition, the programme will involve young, motivated scientists specifically to conduct research activities under the direct supervision of the programme manager. On this basis, the programme will form a cadre of scientists by recruiting seven research fellows at the level of national programme officers (four for Node I and three for Node II) in the areas of socio-economics, animal production and range-fodder production.

18. National activities will be discussed, and annual workplans and budgets will be developed at annual national coordination meetings. A mid-term and a final seminar on programme achievements will be held in alternating country locations to provide the opportunity for the participating national scientists, ICARDA and other collaborating institutions to exchange research results, technological developments and information, as well as to discuss, in the case of the mid-term plan, issues that require further regional attention. Intercountry cooperation will also be facilitated through the information network to be established by the programme, exchange visits among countries and travelling workshops.

19. A programme steering committee will be created, comprising national coordinators, ICARDA's regional coordinator, representatives of IFAD projects linked with the programme and the donor agencies. The steering committee will meet once a year to review, amend and approve the annual workplans and budgets developed during the national and regional meetings.

20. The Asia and the Pacific Division has the capacity to undertake supervision and will directly supervise this grant through its grant supervision budget.

VI. INDICATIVE PROGRAMME COSTS AND FINANCING

21. The total cost of this three-year programme is estimated at USD 2 131 665. IFAD's proposed contribution is estimated at USD 1.2 million. ICARDA's overhead for the grant is 12% of the cost, much in line with similar grants of this nature. The in-kind contribution of ICARDA is estimated at USD 308 465. The in-kind contribution of the participating NARSs will cover the salaries of scientists and the provision of research facilities, vehicles, etc. and is estimated at USD 623 200.

ANNEX I

**PROGRAMME COSTS AND FINANCING
(USD million)**

		IFAD	ICARDA	NARS	Total
	IFAD contribution				
1.	Personnel				
1.1	ICARDA	188 000	201 860		389 860
1.2	National	43 000		205 700	248 700
1.3	Partners	31 000			31 000
	Subtotal	262 000	201 860	205 700	669 560
2.	Travel	270 000			270 000
3.	Equipment, materials and supplies				
3.1	Capital	100 000		124 600	224 600
3.2	Materials and supplies	150 000		292 900	442 900
	Subtotal	250 000		417 500	667 500
4.	Training	70 000			70 000
5.	Workshops and meetings				
5.1	Regional workshops	60 000			60 000
5.2	Annual national coordination meetings	45 000			45 000
5.3	Annual regional coordination meetings	100 000			100 000
	Subtotal	205 000			205 000
6.	Reporting and publications	15 000			15 000
	Total direct costs	1 072 000	201 860	623 200	1 897 060
7.	Indirect costs	128 000	106 605		234 605
	Total IFAD contribution	1 200 000	308 465	623 200	2 131 665

LOGFRAME

Narrative Summary	Measurable Indicators	Means of Verification	Important Assumptions
<p>Goal: To improve the livelihoods of small-scale livestock producers in rural communities in dryland areas of Central and South Asia</p>	<ul style="list-style-type: none"> Improvement in national diets (calories and protein) Rise in national per capita incomes Improved resource management 	<ul style="list-style-type: none"> Published national economic indicators 	<ul style="list-style-type: none"> Government commitment to the goal The necessary accompanying capital investment and structural development programmes are undertaken
<p>Purpose: To develop and promote community-based actions to support productive and sustainable livestock systems, access to market opportunities and the sustainable management of the natural resource base in the region</p>	<ul style="list-style-type: none"> Increased output and farm incomes Establishment of community-based enterprises Improved natural resource (rangeland) management 	<ul style="list-style-type: none"> Reports by governments and external reviewers Surveys inside and outside pilot community lands 	<ul style="list-style-type: none"> Recommended policy and property right reforms are acceptable to governments Enabling conditions: physical, social and institutional infrastructure (e.g., markets, credit) are developed Governments and national extension staff support wide dissemination of pilot study results through ongoing development projects
<p>Outputs</p>			
<p>Output 1. Adaptive research: <i>Community-based research network</i></p> <p>1.1 A community-based on-farm network for adaptive and participatory research is operational in at least one community in each country</p> <p><i>Socioeconomic issues and community action</i></p> <p>1.2 Analysis of livelihood determinants and assessment of the socio-economic and environmental consequences of technical and public management options for rangeland-livestock-cropping systems in the study areas</p> <p>1.3 Assessment of appropriate policies regarding land tenure, property rights and marketing</p>	<ul style="list-style-type: none"> At least eight community-based research sites are operational Publications available on characterizations concerning socio-economic issues and range-livestock-cropping management options for all participant countries Publications available on assessments of existing policies 	<p>For all outputs:</p> <ul style="list-style-type: none"> Field visits when appropriate Interviews with farmers and training of staff when appropriate Annual programme reports Articles in scientific journals Conference proceedings Extension bulletins 	<p>For all outputs:</p> <ul style="list-style-type: none"> Posting of a part time scientist in the region who is funded by the project to oversee the programme National programme officers are hired by the programme to support research in specific areas Complementary activities in other programmes in the region will provide information to avoid the need for redundant literature reviews, policy and socio-economic background surveys Development projects are willing to establish a joint framework for training and technology testing and to allow access to available information

8

Narrative Summary	Measurable Indicators	Means of Verification	Important Assumptions
<p>1.4 Assessment in each community of complementarities for the management of resources and the marketing of products and testing of options for the exploitation of these complementarities for income generation</p> <p>1.5 Community action encouraged to re-establish rotational grazing, boost the access by farmers to remote ranges and rehabilitate areas around the villages and common-use grazing paddocks</p>	<ul style="list-style-type: none"> • The use of best practices based on complementarities between production systems is observed • Six communities observed using best practices in range grazing and management 		<ul style="list-style-type: none"> • Effective collaboration among programme components, scientists and associated institutions will take place • Adequate funding will be available • Appropriate technical and logistic support
<p><i>Testing of technological options</i></p> <p>1.6 Annual and perennial fodder species adapted to local conditions are tested by the communities, and options are investigated to allow access to these resources during critical periods of feed shortage by promoting community arrangements for production and marketing</p> <p>1.7 Options are tested, and cost-benefit issues are analysed for increased flock productivity and the improved quality of livestock products, including value addition, as a result of production re-orientation and diversification, for better targeting of market opportunities</p> <p>1.8 Recommendations for technology and management options are published</p>	<ul style="list-style-type: none"> • Improved practices for enhancing fodder production are available and in use in pilot communities • Proper documentation for the implementation of practices are available • Improved management options to increase flock productivity are available and in use in pilot communities with diversified production • Documentation on the application of practices are available • Published report available 		

Narrative Summary	Measurable Indicators	Means of Verification	Important Assumptions
<p>Output 2. Information and networking</p> <p>A virtual centre for information is constituted that can be accessed through the Internet and electronic mail and that contains scientific, technical and extension literature; databases on institutions, researchers and projects, a photo library, links and capacity for discussion fora</p>	<ul style="list-style-type: none"> • One centre for information accessible through the Internet is in operation 		
<p>Output 3. Skills improvement</p> <p>3.1 NARS scientists are trained in the use of appropriate socio-economic analysis and modelling tools; methods of feed evaluation, production and utilization, range rehabilitation and range and small ruminant management</p>	<ul style="list-style-type: none"> • Documentation of training efforts and ongoing application of improved skills to specific research activities • At least 14 NARS scientists trained in new livestock production research approaches with evident skill improvement 		
<p>3.2 Regional workshops conducted on research methodologies and impact evaluation</p> <p>3.3 National workshops conducted involving the communities, researchers and staff of IFAD development projects, when appropriate, to introduce PR methods and to train farmers in technological aspects</p> <p>3.4 Selected NARS scientists trained in specific subjects through short-term training overseas</p> <p>3.5 Technical staff of development projects are trained under cofunding arrangements</p>	<ul style="list-style-type: none"> • Three regional workshops are conducted, and outcomes are published • At least ten national community-based workshops are conducted, and outcomes are published • The number of training courses and trained development project staff 		

**INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS:
GROWING OUT OF POVERTY: INTENSIFICATION OF SORGHUM AND MILLET SYSTEMS
BY UNLOCKING THE POTENTIAL OF LOCAL BIODIVERSITY AND MARKET OPPORTUNITIES
IN SEMI-ARID WEST AFRICA**

I. BACKGROUND

1. Improving the livelihoods of Sahelian populations depends largely on increasing agricultural productivity and better access to local, regional and international marketing opportunities. Sorghum and millet, as the staple foods of the region, provide the foundation for food security, nutrition and the agricultural production systems of the region. Major new opportunities for significantly improving these systems and thus the livelihoods of 100 million impoverished Sahelian farmers are waiting to be tapped.

2. Firstly, conditions are ripe for change. Production systems are rapidly evolving as farmers seek to intensify production and become more aware of market opportunities. The vital role of agriculture as a motor for development is increasingly appreciated, as clearly indicated by the New Partnership for Africa's Development.

3. Secondly, a suite of new approaches offers real promise for enhancing the success and impact of agricultural research and development efforts. Most important are the approaches of: (a) the efficient utilization of locally adapted biodiversity to create improved crop varieties by combining increased productivity and excellent adaptation to local conditions through close interaction and collaboration with farmers and their organizations; (b) the enhancement of the marketing capacities and options of farmers and farmer organizations, with a special focus on seeds; (c) the enhancement of the capacities of farmers and researchers to create positive synergies by integrating the management of genetic and other natural resources in the context of specific production systems; and (d) the importance of collaboration and coordination across countries and institutions for achieving progress is leading to developments such as the West and Central African Council for Agricultural Research and Development.

4. Stakeholder meetings were held in Burkina Faso, Mali, Niger and Nigeria in preparation for this proposal. Farmers identified the following priority issues that would serve as the key axes for this proposed programme: (a) increasing system productivity; (b) improving the availability of seeds of more productive varieties; (c) improving soil fertility; and (d) enhancing marketing options for increased income generation.

II. RATIONALE/RELEVANCE FOR IFAD

5. Sorghum and millet improvement research conducted in West Africa by ICRISAT and national programme partners (farmers and researchers) has been substantially reoriented during the past six years. This reorientation seeks to realize the major opportunities being offered by new participatory tools developed specifically for this region and its rich biodiversity for improving the productivity and marketing of staple crops. The substantial knowledge-base developed through research on these tools and their implementation is now being integrated into "seamless" development activities that link variety development, seed production and dissemination, natural resource management (especially *Striga* control) and marketing. This progress, to date focused primarily in Mali, needs to be translated into new opportunities for farmers in similar sorghum and millet production zones throughout West Africa. The key opportunities that arise from this body of work are as follows.

ANNEX II

- The benefit of and need for regional collaboration among cereal research programmes are evident in achieving the effective exchange of locally adapted germ plasm and the robust testing of new innovations and materials within specific climatic zones of adaptation, taking advantage of advances made by individual countries;
- The benefit of and need for integrating the skills and knowledge of farmers are evident in the selection process for developing superior varieties for each target production zone. The involvement of rural women and women farmers, especially locally organized women's groups, in the research process is necessary for the progress of these efforts. While sorghum and pearl millet are traditionally men's crops grown for subsistence, women are increasingly marketing products processed from sorghum and pearl millet.
- The benefit of and need for increasing income generation in traditional cereal crops through new marketing opportunities are evident because food and feed processing industries are emerging in West and Central Africa. Creating institutional linkages among processors, producers and researchers is necessary to strengthen the marketing potential for traditional subsistence crops. Seed marketing efforts need to be linked to specific grain marketing channels in order to be sustainable and dynamic.

6. This programme targets enhanced agricultural performance, which is described as a prerequisite of economic development in the Omega Plan of the New Partnership for Africa's Development. It likewise addresses the first mission statement of the West and Central African Council for Agricultural Research and Development, which is the improvement of the efficiency and effectiveness of agricultural research in West and Central Africa by contributing to strengthening and coordinating the capacities of NARSs through cooperation among its members, development partners, regional and international organizations, the private sector, NGOs and the users of the research results.

7. The programme addresses key objectives of the IFAD strategic framework and the regional strategy for West and Central Africa by: (a) strengthening the capacity of the rural poor and their organizations for accessing, testing, adapting and spreading new research products; (b) creating technologies that raise agricultural and natural resource productivity; (c) creating new market opportunities for the crops and seeds of poor farmers, thus helping to increase rural incomes; (d) giving farmers new crop varieties and production options for managing key constraints, thus reducing the vulnerability of farmers to major threats; (e) strengthening platforms for improved access to technology, seeds and knowledge; and (f) implementing sound participatory practices for planning, conducting and evaluating programme activities, thus contributing to improvement in the pro-poor and pro-women focus of all partner institutions.

III. THE PROPOSED PROGRAMME

8. **Target group:** Ironically, the dryland cereal producers of semi-arid West Africa are both the providers of the staple foods for the region and a major portion of the low-income, food-insecure people of the region. Research efforts would be targeted at farmers, women and men in two zones: the Sahelian zone, which has 300-600 mm annual rainfall and in which mainly pearl millet is cultivated (northern Mali, Niger and northern Nigeria), and the Sudanian zone, which has 600-800 mm rainfall and in which sorghum is the predominant crop (Burkina Faso, Mali and northern Nigeria).

9. Key programme activities:

Participatory breeding

- (a) Five activities: (1.1) make broadbased, well-adapted sorghum and pearl millet populations available to farmers and NARSs as base material for the development of novel, superior varieties; (1.2) implement regional recurrent selection in sorghum and pearl millet through

ANNEX II

national breeders and with farmer participation; (1.3) implement the participatory selection of superior varieties of sorghum and pearl millet from broadbased populations; (1.4) increase the adaptation and productivity of new cereal varieties through more effective evaluation of photoperiod response and improved understanding of traits that determine potential for yield improvement; and (1.5) institutionalize large-scale variety testing among farmers in all countries.

Enhancing the local seed system

- (b) Three activities: (2.1) identify the specific strengths and weaknesses of the seed systems of farmers in each programme zone; (2.2) identify sustainable options for local seed production and dissemination; and (2.3) draw and communicate the lessons from seed system analysis and the successes across the programme region.

Enhancing system productivity

- (c) The diversity field forum and farmer field school platforms implemented through the joint International Plant Genetic Resources Institute-Food and Agriculture Organization grant are well suited to work with farmers on complex issues such as integrated soil fertility and water management. We propose three activities related to cereals cropping as units to be integrated within these platforms: (3.1) the scaling up of integrated *Striga* control for sorghum and pearl millet systems by broadening the scope of existing platforms for farmer research interactions, extension programmes and modern communication tools; (3.2) support decision-making among farmers with respect to different intensification options, e.g., fertilizer and manure application, seed treatment, intercropping and weed and insect management; and (3.3) assess the physiological feasibility of grain yield improvements through crop management and genetic enhancement.

Identify and test the marketing options

- (d) Four activities based on the same diversity field forum and farmer field school platforms: (4.1) understand the commodity chain; (4.2) identify promising marketing options for pearl millet and sorghum in the programme areas; (4.3) test and promote small-scale grain processing for urban use; and (4.4) enhance the capacity of farmers for the effective marketing of grain.

IV. EXPECTED OUTPUTS/EXPECTED BENEFITS

10. **Goal:** The livelihoods of farmers in the Sahelian and Sudanian zones of Burkina Faso, Mali, Niger and Nigeria are improved through the intensification of sorghum and millet systems using local biodiversity, creating new market opportunities and adapting biological knowledge.

11. **Objectives:**

- enhance gender-sensitive participatory processes throughout the entire research and development continuum, with an explicit focus on the enhancement of women's opportunities for income generation and increasing the capacity of women to provide healthy nutrition for their families;
- build on the local knowledge base by facilitating experimentation among farmers themselves and farmer-to-farmer exchanges of practices and innovations and by supporting specific research to facilitate the better use of local knowledge;
- strengthen the capacity of farmers to access, adapt and evaluate technological innovations for increased productivity and sustainability; and

- catalyse greater collaboration among national agricultural research programmes in West Africa that share common agroecologies and production systems.

V. IMPLEMENTATION ARRANGEMENTS

12. The programme will be managed by ICRISAT and coordinated by an ICRISAT scientist based at the institute's research centre in Bamako, Mali, under the direction of the ICRISAT director for West and Central Africa based at the institute's regional hub at Niamey, Niger. There will be three levels of implementation: regional, national and local.

13. At the regional level, a six-person multidisciplinary team of scientists (including the programme coordinator) will operate out of ICRISAT and the research centres of the Institute for the Environment and Agricultural Research (three at ICRISAT-Bamako (Mali), one at ICRISAT-Samanko (Mali), one at ICRISAT-Niamey (Niger) and one at the research station of the Institute for the Environment and Agricultural Research in Ouagadougou (Burkina Faso). Disciplines represented in this "regional team" would include plant genetic improvement (sorghum and millet), eco-physiology, *Striga*-weed management, economics and marketing. This regional team would carry out research both at ICRISAT research facilities and in collaboration with national partner institutions.

14. At the national level, five research institutions in four countries have agreed to be programme partners; the Rural Development Institute, in Mali; the Institute for the Environment and Agricultural Research, in Burkina Faso; the National Institute of Agricultural Research, in Niger; and the Lake Chad Research Institute and the Institute of Agricultural Research, both in Nigeria. The regional team would select a national team of scientists, in consultation with the national partner institutions. Four well-qualified and experienced national coordinators would be selected to supervise programme operations in each of the four countries under the overall control of the programme coordinator. National coordinators will receive a salary supplement from grant resources in recognition of their additional responsibilities.

15. At the local level, the programme would collaborate with development projects that have a common aim of improving rural incomes by increasing the productivity of sorghum and millet crops. At meetings held during the programme design process, interest in collaborating was demonstrated by IFAD-funded development projects: the Sahelian Areas Development Fund Programme (Mali), the Community-Based Agricultural and Rural Development Programme (Nigeria), the Project for the Promotion of Local Initiative for Development in Aguié (Niger), the Rural Microenterprise Support Project, the Sustainable Rural Development Programme and the Community Investment Programme for Agricultural Fertility (Burkina Faso). Development projects financed by other agencies and farmer organizations have also expressed interest in collaborating with the programme. Programme activities will be implemented in two or three areas of each country, chosen in conjunction with IFAD loan- and grant-funded projects. Facilitators in all the trial villages would receive regular training in technical matters, coordination and communication skills with the objective of enhancing the capacity of farmers to understand and adopt technical innovations.

16. National coordinators and national researchers from the partner institutions would work in conjunction with project management unit staff and service providers associated with the development projects. Within each project area, a site facilitator will be appointed to assure productive relationships between the villagers and researchers. At each programme site, programme partners will jointly develop yearly workplans, which will include monitoring visits by the appropriate partners and stakeholders. After each cropping season, the results, achievements, process outcomes and new opportunities will be discussed and used as a basis for discussion at the national planning meetings.

ANNEX II

17. The programme would also collaborate closely with other IFAD grant-funded programmes being implemented by other CGIAR centres in the region, including the World Agroforestry Centre and the International Plant Genetic Resources Institute. Using grant resources, ICRISAT would cofinance the employment of the marketing economist (paragraph 13), in conjunction with the World Agroforestry Centre. Memorandums of understanding would be established to facilitate this collaboration.

18. The programme will be governed by a steering committee, consisting of representatives of ICRISAT, the International Cooperation Centre on Agrarian Research for Development, IFAD and project partner institutions. The steering committee will meet annually to review the progress of the programme relative to objectives, approve annual workplans and budgets and make recommendations. The programme coordinator will perform the function of secretary of the steering committee. At the country level, national planning committees will be established in each of the four participating countries. Among the participants will be representatives of national programme partners, including relevant IFAD-funded development projects, farmer organizations, universities and NGOs. Meetings of the national planning committees will be held annually to review results and plan activities for the coming year. The national coordinators will act as secretaries at the meetings. The findings and recommendations of the national planning committees will be on the agenda of the annual steering committee meeting. Grant funds will not be used to support the participation of IFAD staff or the staff of IFAD-funded projects in any of the above meetings.

VI. MONITORING AND REPORTING ARRANGEMENTS

19. Programme partners will develop a logframe for each programme activity, showing specific achievements and the relevant indicators, as well as the means of verification. This will be used as a basis for programme monitoring (in addition to the standard performance monitoring indicators routinely used by partners). As most of the research will be undertaken at the site of IFAD investment projects, project monitoring and evaluation units will be involved as far as possible in monitoring activities.

20. Programme and financial reporting will be the responsibility of ICRISAT. The technical content of annual reports will be provided by the programme coordinator, drawing on reports of the four national coordinators. In addition to technical information based on programme activities, the reports will include financial reports based on annual audits of the programme accounts. Towards the end of the programme period, a workshop will be organized. One of the objectives of this meeting will be the presentation, discussion and consolidation of participatory plant breeding tools for West Africa.

VII. INDICATIVE PROGRAMME COSTS AND FINANCING

21. In addition to the proposed IFAD grant, the programme will be financially supported by ICRISAT, the International Cooperation Centre on Agrarian Research for Development, the Netherlands Development Organization (Dutch Ministry of Foreign Affairs) and national partner organizations (all in cash and in kind), as detailed in the table below.

22. ICRISAT has established internal financial controls and external auditing procedures to assure the appropriate use of the funds entrusted to it. Agreements and memorandums of understanding will be established with each partner organization; these will set out the financial and other responsibilities of each organization, the outputs and the agreed budgets. The continued dispatch of funds to national coordinators would be dependent on accurate accounting and records for agreed expenditures and the reporting of results. ICRISAT annually reviews the quality of the science of each of its researchers through a two-stage process. In addition, in-house reviews of regional projects and global themes and

ANNEX II

external reviews are organized on a regular basis. Similar procedures are in place for the international partners.

23. The procurement of goods and services from the proceeds of the IFAD grant would be carried out according to the ICRISAT procurement guidelines, which are based upon those of CGIAR.

PROGRAMME COSTS

CATEGORY	IFAD	ICRISAT	NARS	CIRAD	SNV	TOTAL
Personnel	390 000	490 000	350 000	250 000	200 000	1 680 000
Research supplies	190 000	150 000	100 000			440 000
Travel	74 000					74 000
Research equipment	77 000	110 000	50 000			237 000
Monitoring and meetings	90 000					90 000
Research subcontracts	86 000					86 000
Training	132 000					132 000
Administrative overhead	161 000					161 000
Total	1 200 000	750 000	500 000	250 000	200 000	2 900 000

CIRAD = International Cooperation Centre on Agrarian Research for Development.

SNV = SNV Netherlands Development Organisation.

LOGFRAME

Objectives	Verifiable Indicators	Means of Verification	Risks and Assumptions
Goal: Improve the livelihoods of farmers in the Sahelian and Sudanian zones of Burkina Faso, Mali, Niger and Nigeria through the intensification of sorghum and millet systems using local biodiversity, creating new market opportunities and adapting biological knowledge			
Purpose: The programme is designed to strengthen the capacity of West African farmers to intensify sorghum- and pearl-millet-based production systems by enhancing participatory processes, building on the local knowledge base, supporting specific research, strengthening the capacity of farmers and achieving collaboration among national research centres	Adoption of some new technologies in the farming system and linkages with new market issues	Field surveys	
Outputs			
1. Enhanced participatory processes	The staff of three large-scale investment projects are familiarized with the tools for participatory diagnosis of agricultural production issues Researchers and their staff are familiar with and using participatory approaches for technology evaluation and adaptation in all countries Eight graduate students are trained in participatory breeding	Visits, project and NARS reports	
2. Local knowledge used as a foundation	Three key issues central to the livelihood strategies of poor sorghum and pearl millet farmers have been documented and analysed	Reports and publications	
3. The capacity of farmers strengthened	The capacity of farmers to interact with researchers and obtain useful information and experiences has been enhanced through joint experimentation, more effective communication and exchanges with other expert farmers	Self-evaluation	
4. Regional research programmes integrated	The regional network of breeders is involved in the recurrent participatory selection; common activities are being carried out in plant physiology and economy	Joint journal articles	
Activities			
1. Participatory breeding			
1.1. Make broadbased, well-adapted sorghum populations available to farmers and NARSs for improvement	One population of sorghum and millet is used in each of the three or four agroecological zones	Field visits, NARS and ICRISAT reports	

Objectives	Verifiable Indicators	Means of Verification	Risks and Assumptions
1.2. Implement recurrent regional selection for sorghum and pearl millet with the participation of national breeders and farmers	At least one participatory plant breeder-graduate student in each country or state of Nigeria is involved in the activity; regional coordination meetings among breeders are being held; one progeny trial per crop and country is successful each year	Field visits, NARS and ICRISAT reports	
1.3. Implement the participatory selection of superior varieties of sorghum and pearl millet from broadbased populations	In each country or state, at least two farmer breeders for each crop practice mass selection in a population of their choice	Field visits, NARS and ICRISAT reports	
1.4. Increase the adaptation and productivity of new cereal varieties through more effective evaluation of photoperiod response and improved understanding of traits that determine the potential for yield improvement	The relationships between photoperiod sensitivity and panicle size are understood; the genetic variability for the character is known	Journal articles, reports	
1.5. Institutionalize large-scale variety testing with farmers in all countries	The seeds of five varieties for each crop and ecological zone are available and have been distributed to 100 farmers in each country	IFAD development project reports, NARS and ICRISAT reports	
2. Enhancing the local seed system			
2.1 Identify the strengths and weaknesses of the seed systems of farmers	The participatory assessment of seed management practices among farmers is being carried out; strategies in villages that are interested in pursuing variety selection and seed production and dissemination efforts are in place	Field visits and surveys, ICRISAT training reports	
2.2 Identify sustainable options for local seed production and dissemination	With at least two interested partners (organizational, or entrepreneurial farmers) per crop and ecological zone and country, financial solutions for effective seed marketing have been negotiated and tested At least 100 farm communities have been trained in seed production technologies; ten small farm enterprises are operational at the project scale, and one seed producer association is active in each country	Field visits and surveys, ICRISAT training reports	
2.3 Draw lessons from seed system analysis and enhancement across the programme region	One regional comparison of pertinent experiences with seed marketing efforts has been carried out	Reports, journal publications	
3. Enhancing system productivity			
3.1. Scaling up integrated Striga control for sorghum and pearl millet systems by broadening the scope of existing platforms for farmer research interactions, extension programmes and modern communication tools	500 farmers per country or state have received intensive training in <i>Striga</i> physiology and integrated pest management 10 000 farmers per country or state have received information about <i>Striga</i> physiology and integrated pest management through radio and other communications	Field surveys and IFAD development project reports	
3.2. Support decision-making among farmers with respect	100 000 farmers have been trained in innovative methods for	Field surveys and IFAD	

Objectives	Verifiable Indicators	Means of Verification	Risks and Assumptions
to different intensification options, e.g., fertilizer and manure application, seed treatment, intercropping and weed and insect management	intensification; 10 000 farmers have adopted at least one of these methods	development project reports	
3.3. Assess the physiological feasibility of grain yield improvements through crop management and genetic enhancement	Participatory agronomical trials have been carried out in the target communities, carefully recorded and analysed, examined with the farmers and published	NARS and ICRISAT reports, journal articles	
4. Identify and test the marketing options			
4.1. Understand the commodity chain	Local level enquiries have been conducted at two sites per zone and country or state on key issues of the commodity chain for the two crops National-level analyses of demand, supply and the relative benefits of different uses, as well as country-specific opportunities for marketing grain, have been carried out One regional overview of key issues in grain marketing and trading exists	Reports and publications	
4.2. Identify promising marketing options for pearl millet and sorghum in the programme areas	In each country, information has been compiled, and the potential demand, quality requirements, grades and standards for one new marketing option have been studied, e.g., poultry feed in Mali	Reports, publications	
4.3. Test and promote small-scale grain processing for urban use	New pilot small-scale units have been implemented in towns in Burkina Faso and Nigeria Participatory testing of the new processing and marketing option in three communities in each country has been carried out	Visits, NARS reports	
3.4. Enhance the capacity of farmers to market grain effectively	Experiences have been exchanged among countries in inventory credit and other cooperative steps to promote marketing skills among small-scale farmers	Community surveys, reports and journal articles	