

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH
TECHNICAL ADVISORY COMMITTEE

For comments

Item 8 : Other Business

(a) CGIAR Strategy for Central Asia and the Caucasus

This background document, prepared by the CDC Task Force for CAC, is a revised version of the paper discussed at TAC 74 and subsequently at TAC 77. The Committee will discuss this revised paper and make recommendations to the CGIAR.

**CGIAR STRATEGY FOR
SUSTAINABLE AGRICULTURAL DEVELOPMENT
IN CENTRAL ASIA AND THE CAUCASUS**

29 FEBRUARY 2000

**CGIAR COLLABORATIVE PROGRAM FOR CENTRAL ASIA AND THE CAUCASUS
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EXECUTIVE SUMMARY

The break up of the Former Soviet Union brought with it many problems for the countries of Central Asia and the Caucasus (CAC). The agricultural sector, which is the mainstay of CAC economies, was adversely affected by the ensuing lack of inputs and the break up of the large farms into smallholdings. Productivity has fallen and living standards have decreased within CAC. However the agricultural sectors have the potential to provide both the required products for national food security, which is now a policy objective, and the basis for economic growth needed to assist the transition towards market driven economies. Agricultural research can provide the technology and training on which agricultural growth can be based but support will be required for the National Agricultural Research Systems (NARS) which all suffer from lack of resources, isolation and management systems in need of reform.

A decision was made, following the Ministerial Meeting held in Lucerne, to expand the geographic mandate of the CGIAR so as to include CAC countries. A series of joint CGIAR Center and NARS meetings followed through which constraints to, and possibilities for, agricultural production and research management reforms were identified. Those research activities necessary to solve problems were outlined through which CGIAR could assist NARS to develop the sector.

Because of its access to readily available technology, expertise in training and well-established global links, which facilitate information flow and exchange, the CGIAR has a comparative advantage in addressing research priorities of this nature. The strategy of the CGIAR centers in assisting research in CAC will be to:

- Concentrate on high priority problems identified by CAC NARS
- Operate in a collaborative mode
- Concentrate on projects producing results that will have a rapid impact
- Strengthen NARS leadership capacity to build self reliance
- Strengthen linkages and levels of cooperation between CAC NARS
- Engage the attention of national leaders as to the value of research in order to enhance the level of national support

A Regional Collaborative Program was established in 1998. The Program is designed to meet national goals by increasing agricultural productivity, improving natural resource management and conservation of genetic material, and strengthening agricultural research management and policy procedures. Cooperation will be fostered between CAC countries and between them and international research organizations. The partners in the Program are eight NARS, nine CGIAR Centers, donors, NGOs and other international and national research and development institutions.

A Program Steering Committee (PSC) will provide overall Program management, with responsibility for guidance, information exchange, progress monitoring and review of research results. The PSC will consist of one representative from each NARS, CGIAR Center and major donors and also one representative from TAC. It will be assisted by an Executive Committee (EC) which will consist of two CGIAR Directors, two representatives from NARS, two from the donors, and one representative from TAC. The EC will be elected from within PSC and will report directly to it. It will oversee funding issues and review progress. A Program Facilitation Unit (PFU) which is located in Tashkent will support both committees. In addition to administration, the PFU will arrange for technical appraisal of

research project proposals before they are submitted to EC and PSC. A CGIAR CDC Task Force is responsible for oversight of CGIAR inputs and liaison between the participating Centers.

Research projects at the country level would be managed and conducted by National Coordinators. Coordination at national and regional level will be arranged through regular planning and review meetings

The Collaborative Program was approved by CGIAR and \$US 2.0 million was allocated to establish the PFU, implement three research projects (conservation, adaptation and enhancement of germplasm; on-farm water management; and national research organization and management) and to support the planning and design phase of three more projects (agricultural research policy setting, livestock production, and watershed management). Co-financing has been acquired for other projects and additional projects are now in the pipeline. Funds have been secured which cover US\$6.0 million of the originally estimated budget, and an additional US\$ 10.0 million is required for continued support for the Program over the next phase.

INTRODUCTION

This document outlines a strategy for the continued support of agricultural research in the countries of Central Asia and the Caucasus (CAC). The CGIAR's research program in CAC is an outcome of a series of initiatives beginning with a Ministerial-Level Meeting in Lucerne at which it was recommended that the CGIAR should consider an involvement with the agricultural research needs of the southern part of the former Soviet Union (FSU). A CGIAR task force was established which, in 1996, proposed an expansion of the geographic mandate of CGIAR and the development of an overall strategy for CAC. A series of workshops/consultation meetings and studies followed, which outlined problems facing the agricultural production and research systems of the CAC countries, possible research activities in need of additional support, and a strategy by which CGIAR could assist the National Agricultural Research Systems (NARS) in CAC in both institutional development and the development of the policies and technology needed for the revival and future development of the agricultural sector.

The current document provides the strategy for implementation of the CGIAR research program in CAC. It also provides information on progress achieved during the start-up phase and reflects some changes in operational procedures that resulted either from experience or from comments received from TAC, CGIAR Centers and NARS. The overall aims and plan of action remain largely similar to those of the approved program and this document includes a request for further financial support to enable those projects already approved and initiated to continue and others in the pipeline to be launched.

1. RATIONALE

1.1 Agriculture in Central Asia and the Caucasus

The Region

Central Asia and the Caucasus (CAC) is comprised of the five republics of Kazakstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan in Central Asia, and the three republics of Armenia, Azerbaijan and Georgia in the Caucasus. The region covers an enormous area - 418 million hectares of which about 70 % are classified as agricultural land. Of this, only 15% are arable land, of which 24% is irrigated. Wheat, cotton and livestock are important agricultural products. About 275 million hectares are classified as rangelands. The environment is characterized by low and variable rainfall and extremes of temperature. The landscape is a mixture of mountain, desert and steppe.

All the republics in the region are in transition from a centrally organized economy towards a market driven economy. These changes have in many cases brought with them a decline in living standards in these eight CAC republics. Output and food consumption per capita of all items, except bread, has decreased. Per capita GNP in the CAC countries is now less than the overall average for developing countries. According to official statistics, 25 to 40% of the population of the region is living below the poverty line.

Importance of Agriculture

Agriculture is of paramount importance in the region as a whole. On average, it is the source of employment for a third of the labour force and its percentage contribution to GDP has increased since the republics gained their independence, but this is due to a decline in other sectors rather than an increase in agricultural production. The region has vast resources and great agricultural potential.

In the former Soviet Union (FSU), the CAC region was essentially a commodity-producing component of a larger system, importing inputs from elsewhere and exporting its produce back. After independence, each country is facing the challenge of developing a "stand-alone" economy, a process that has required enormous efforts for changes at the political and economic policy levels. These have had repercussions in the agricultural sectors in each of the republics. Efforts towards implementing structural adjustment and particularly in the privatization of large-scale state and collective farms (and the subsequent move of production to the smaller private holdings) have resulted in a variety of problems. Disruption of input supplies and imports, the deterioration of irrigation system infrastructure and the disintegration of the formerly centrally operated marketing and supply systems have all contributed to the decline in productivity and production. The levels of yields and production are well below those of other countries. Also, annual productivity and production show great variation, partly due to the harsh and variable climate and short growing season. This variation is also visible from republic to republic.

But the region also has strength in several areas. The region has diverse agriculture, the potential of which is great. There are enormous intellectual resources built on a long history of agricultural research in the region. There are many institutes and farms, often very large. The NARS are experienced and long established. Agriculture could thus play a large role in the revitalization of the national economies. Since their independence each country has begun to restructure its agriculture to meet national goals and needs although there are large differences in the approach taken and the progress made among the eight republics. Restructuring will require substantial diversification in agricultural production. Agricultural research can provide the technology on which development can be based.

1.2 The Current Status of NARS

Under the FSU, the importance of agricultural research in providing the technology for productivity gains was well recognized and there was a long history of successful research. Well-trained scientists benefited from the cooperation and communication that existed between the research institutions located in what are now the independent republics. Today, national research programs are facing financial stringency. Operating funds have been cut, salaries have stagnated in an environment of inflation, and research management efficiency has been adversely affected. In these circumstances the traditional approach to research problems through discipline based, centrally directed, programs has been maintained and newer approaches through collaborative multidisciplinary teamwork and program management have not been introduced. There has been a resultant exodus of qualified staff from the NARS. In addition, the creation of independent NARS has increased isolation of the scientific community, both from each other and from the scientific community at large, so that many scientists are now unaware of modern developments in their research fields.

External support to the NARS will provide the information and technology on which to base increases in agricultural production, rural development and in the long run poverty alleviation. Rapid action is therefore needed, with international assistance and collaboration, to address the problems that have been identified by the NARS themselves in the areas of policy reform, institutional redirection, and technology generation suitable for the present situation.

2. THE CHALLENGE

In the post-FSU, there has been deterioration in the physical and institutional infrastructure. This has had severe repercussions on the national agricultural sectors of the CAC countries. Food imports no longer supplement production in these countries as they did in the past. This has led to a drive for food security and thus a concentration on domestic production of major food crops. This is being done by intensification, and expansion of area. The former has caused monoculture and without adequate use of fertilizers had resulted in lower soil fertility, while the latter has reduced crop diversity.

Environmental damage is being aggravated by excessive monoculture of crops. Inadequate crop rotations cause reduced soil fertility and increased pests and diseases, and salinity has resulted from lack of land drainage. Vast rangelands are being irrationally used and neglected. This has added to feed and fodder supply problems, which are resulting in a decline in livestock numbers. A general reduced availability of inputs, the deterioration of irrigation system infrastructure, the disintegration of the formerly centrally operated marketing and supply system and inadequate attention to agrarian reforms and socio-economic problems have all contributed to a decline in productivity.

Currently, the NARS in CAC are in serious financial difficulties and do not receive adequate attention and commitment from their national governments. They need reorientation to meet the new challenges facing these countries. Similarly, the current professional isolation of the CAC agricultural scientists due to poor linkages with the global scientific community needs to be examined and rectified. The NARS, thus, urgently need to be strengthened to meet the challenges of their new national agriculture policies and agricultural development.

3. CGIAR COLLABORATION WITH CENTRAL ASIA AND THE CAUCASUS

The CGIAR was involved, to a limited extent, with the Central Asia and Caucasus (CAC) region before the break-up of the former Soviet Union. Subsequently, a number of CGIAR Centers (ICARDA, CIMMYT, IFPRI, IPGRI, ISNAR and ICRISAT) carried out missions to CAC countries. Follow-up activities included the organization of workshops with NARS scientists. There was also a limited amount of germplasm exchange mainly through ICARDA and CIMMYT.

In 1995, ICARDA organized a workshop in collaboration with BMZ/GTZ of Germany, with participation from other CGIAR Centers (CIMMYT, IPGRI and ISNAR) to identify the agricultural research needs of CAC. The workshop brought the key scientists and research managers together and emphasized the need for regional collaboration to tackle priority problems in agricultural production and natural resources. This was followed by two consultation meetings in 1996; one on the livestock situation in Central Asia and the other on plant genetic resources conservation in CAC. Both workshops identified broad areas for collaborative research. In addition to workshops, CIMMYT, ICARDA, ICRISAT, IFPRI,

IPGRI and ISNAR staff have visited the region, and NARS scientists have attended seminars, international meetings and conferences.

The CGIAR's major involvement in CAC developed with a series of initiatives beginning with a Ministerial-Level Meeting in Lucerne at which it was recommended that the CGIAR should consider an involvement with the agricultural research needs of the southern part of the former Soviet Union (FSU). A Task Force was established which, in 1996, proposed an expansion of the geographic mandate of CGIAR and the development of an overall strategy for Central Asia and the Caucasus (CAC). A series of Workshops and studies followed which outlined problems facing the research systems of the CAC countries, and NARS priorities.

4. ANALYSIS OF CONSTRAINTS AND OPPORTUNITIES

The following is a synthesis of findings of the CGIAR Task Force/NARS 1996 Consultation, and other workshops and meetings between CGIAR Centers and the national programs of the region.

4.1 Constraints and Opportunities in Agricultural Production

The region can be divided into basic ecological zones determined by latitude, which determines climate, and altitude (plains, mountains and upland valleys). Adding to this the availability of water, which determines the primary land use, four agroecological zones can be defined: lowland rainfed; lowland irrigated; lowland semi-arid rangeland; and mountains (mountain pastures supporting extensive livestock, with irrigated crops in the valleys). Production constraints differ between agroecological zones.

- In rainfed areas, inputs are low and problems are developing in maintaining soil fertility under the predominant cereal-based systems in the absence of fertilizers. The emerging small farmers need assistance with enterprise development and the introduction of new crops and rotations. Considerable potential exists for developing mixed farming based on the integration of crop and livestock production.
- In irrigated areas, salinization and waterlogging are major problems due to either the lack of drainage systems or poor maintenance of existing drainage systems and rising water tables. Management of former state-operated large-scale irrigation systems is collapsing. Opportunities exist for intensifying irrigated agriculture, but only if appropriate water management systems are applied for delivery of water to private holdings and appropriate irrigation practices are employed to maximize the productivity of water.
- The vast areas of semi-arid non-arable steppe lands provide rangeland for livestock. Previously controlled by the state agricultural enterprises, the redistribution of these common lands is leading to problems of open access and overgrazing and degradation in some areas. Cutting of trees and removal of woody species for fuel is exacerbating the problem. The traditional arrangements that controlled access and grazing prior to collectivization have long since disappeared. Opportunities exist for improving the productivity of rangelands, but only if suitable access and grazing systems are implemented.

- In mountain areas, foothills and upland valleys support dryland farming. Productivity is low and the farming communities are among the poorest in the region. Harsh conditions promote out-migration and land abandonment. Subsistence is obtained from drought resistant crops, such as barley, and transhumant flocks of small ruminants that move to the mountain pastures in the summer. Much of agriculture is conducted on sloping land and soil erosion by water run-off is a localized but major problem. More productive, but resource conserving, modes of land use are needed.

Other problems cut across these major agroecological zones. With the collapse of trade within the former Soviet Union, the governments of CAC are giving priority in agricultural production to securing the domestic supply of basic food commodities, but average yields are far below those achieved in agroecologically similar regions of the world, reflecting the decline in inputs. Furthermore, because only a few varieties from the central breeding programs were distributed, and are widely grown, crops are highly vulnerable to the outbreak of new diseases. All countries of the region face similar problems in seed supply due to the collapse of the former large-scale seed production on state farms. No replacement systems have been put in place to ensure the diffusion and adoption of new varieties that may flow from research.

Since independence, livestock numbers have been reduced drastically in all countries. Reduced shipments of imported feed concentrates to supplement limited winter grazing led to a general reduction in herd size; prices for products (milk, meat and wool) plummeted and markets have shrunk with the reduction in consumers' incomes and a decline in processing facilities, while feed costs have risen. With the redistribution of state owned farms, livestock were transferred into the private sector and disposed of quickly for immediate income. There is considerable scope for improvements in livestock production, including the genetic improvement of stock for adaptation to specific environments and for specific products (milk, meat or wool), and better on-farm feed production and feeding practices.

Central Asia and the Caucasus are the center of origin of a number of important crops and possess a wealth of genetic diversity. Under the former Soviet system, all crop genetic resources work was coordinated by the N.I.Vavilov Research Institute of Plant Industry (VIR) in St. Petersburg. With the break up of the USSR, the regional institutes have lost their guidance. Lack of funds for research has in some countries led to closure of research institutes responsible for plant genetic resource conservation, with the danger that existing gene banks, herbariums and *in situ* conserved resources will be permanently lost.

Agrarian reform and attention to socio-economic problems have progressed at different rates in different countries in the CAC region. Those countries that have moved ahead with decollectivization and privatization of land are encountering problems arising from the fragmentation of land, particularly in the management of large-scale irrigation schemes. The shift from large-scale state and collective farm systems of production to privatization raises issues of land tenure, access, and use rights, and agricultural employment. The emerging farmers are inexperienced in operating a farm business, need help in developing new farm enterprises and the rational use of land and water. There is a general lack of awareness about the need for sustainable use of natural resources, and its implications for future production. Finally, effective extension, farmer advisory services, credit facilities, and marketing arrangements need to be established.

4.2 Constraints and Opportunities within the Agricultural Research System

The collapse of the former Soviet Union has not only disrupted production and trade, it has also had considerable impact on the research systems. Many of the constraints facing the research sub-sector are unique to particular republics. However, there are several that are common to all and these could be addressed on a regional basis. These major constraints are to be found in research policy, organization and structure, financial resources, linkages with users, access to information and materials, and the effects of restructuring the agricultural sector in a transition towards a market economy.

- Research policies are still largely based on the previous centrally planned system, though a number of countries have begun to reformulate policies in the light of new national goals. However, national scientists have little experience in formulating policies to meet these goals, or in assessing these policies at the farm level. Data sources are inadequate. NARS require assistance in the preparation of policies for such issues as food security, land use and land tenure, sustainable land use, institutional linkages etc.
- Agricultural research has not received the support it deserves from Governments and has been starved of operating funds. Steps are needed to educate the high-level decision makers as to the benefits of research in order to obtain a higher financial allocation for its operation.
- Organization and management of research also reflects the central Soviet scheme. Several institutions deal with agricultural research in each country. Under the Soviet system each of these was linked to its counterpart in the other Soviet Republics, rather than with the other institutions within the same country, and hence the level of coordination and linkages between institutions within a national system are weak. Rapid action is needed in order to establish linkages between scientific institutions, provide research workers with a continuous flow of information, improve research management and strengthen linkages between research and extension services.
- Research systems have been staffed, for the most part, with highly trained scientists, but shortages of funds have led to a significant exodus of staff from research. Most scientists are not familiar with the research needs of the smallholder production systems that have replaced the large state farms. Assistance is needed in research planning and priority setting.
- Lack of contact with the international scientific community has caused a technology lag and prevented scientists from keeping abreast of current scientific achievements. A need for training in the new scientific technologies and computer technology is recognized. There is also a critical need for English language training to improve access to current scientific literature and communication with the international scientific community. Information resources are scarce and need to be developed at all levels. Physical facilities need upgrading urgently. Modern equipment is needed to make research more efficient and computer facilities are needed to aid data management. While such infrastructure development is expected to be provided through development projects, support would be needed in many training aspects.

5. NARS PRIORITIES FOR RESEARCH

The following is a summary of the output of the CGIAR Task Force's special Working Group on *Research Priorities: Needs and Opportunities*.¹ There is currently little capacity for priority setting in the research systems of CAC due to lack of experience, the discontinuities of the transition period, and the inadequate coordination between ministries, academies and other entities involved in agricultural research. At consultations held in Tashkent in 1995 and 1996, agricultural research leaders from the countries present were asked to give an indication of their national priority program areas.

The Working Group, comprised mainly of representatives from the Academies of Agricultural Sciences of the countries concerned and some CGIAR Center representatives, defined six broad research areas and prioritized them in the following order: 1. Crop Improvement; 2. Policy and Institutional Development; 3. Resource Management; 4. Livestock Improvement; 5. Capacity Building; and 6. Rangeland Management. Within each of these broad areas, country representatives then indicated their priorities.

For crops, cereals and forages ranked highest. Crop activities given high priority included seed production and breeding. For policy and institutional development, the group ranked research finance, research policy, and research management in that order. Resource management issues were ranked by most countries in the following order: soils, water, biodiversity. Soil fertility and irrigated lands were given highest priority, and there was an expressed need for both *in situ* and *ex situ* biodiversity conservation. For livestock, cattle ranked higher than small ruminants. Livestock research activities were prioritized as feeding, breeding and health. Capacity building dealt with a range of issues with widely varying degrees of importance assigned by different countries. They included: specialized training, language training, participation in international meetings, degree training, communications and library facilities. For rangeland research, priority was evenly split between rehabilitation and management.

The CGIAR Task Force identified five levels of potential activity for CGIAR in the CAC region, varying in their complexity and investment requirements. These included:

- access to information, to overcome the major constraint of lack of up-to-date information in the NARS and is an area where the CGIAR can assist through the distribution of publications, literature, training, materials, etc.;
- access to genetic resources including distribution of germplasm for assessment and evaluation, inclusion of national programs in international plant genetic resource networks and expanded involvement of IPGRI and other IARCs in the development and improvement of national genetic resource conservation systems;
- transformation of national agricultural research systems, a common need being assistance in restructuring and improving the effectiveness of NARS in responding to a rapidly changing agricultural sector;
- expansion and intensification of existing and potential CGIAR activities in the region;
- development of a coordinated long-term CGIAR strategy for the region

¹ Report of the CGIAR Task Force on Central/Eastern Europe and the Former Soviet Union. International Centers Week 1996. CGIAR, October 10, 1996.

6. STRATEGY FOR RESEARCH IN CAC

6.1 Comparative Advantage of the CGIAR

Many of the problems facing the crop and livestock production systems and the improvement of policy and management in CAC fall within the CGIAR research mission to alleviate poverty through improving agricultural productivity while protecting the resource base. The CAC countries have per capita GNP levels below the average for all developing countries and therefore on this basis alone they qualify for CGIAR assistance and support.

In CAC, solutions are required for both national and regional problems in the agricultural sector and in agricultural research in particular. While the national problems in agricultural research vary between republics depending on the state of the economy and degree to which the policies and strategies of the "transition" have been implemented, there is also a range of common problems that warrant a regional approach. The task of assisting the NARS is so great that it would be beyond the capabilities of a single institution or research center. Connections on a bilateral basis are unlikely to produce the menu of options that will be needed throughout the region as a whole. An international approach is necessary.

While there are other providers of research and development assistance operating in the region, the CGIAR has a proven advantage in being able to draw on wide ranging experience both with agricultural research in the agroecologies relevant to the various needs of the different developing countries and in tailoring research management techniques and institutional development to the needs of different developing countries. CGIAR can offer a flexible approach and intensive support to the CAC region. It can mobilize support from many of its International Agricultural Research Centers (IARCs) for a collaborative program. It can foster strategic alliances among CAC counties and between these and a global network of experienced scientists. It is experienced in working in the partnership mode and can assist in forging links with other international organizations, advanced research institutes and national research programs which would be unaffected by the political considerations common to many bilateral arrangements. CGIAR involvement in assisting the development of agricultural research in NARS would be the most effective way of making new technology and policy elements available to NARS and of avoiding the wastage of effort and resources in duplicating the research necessary for the development of new technologies. There are few alternative sources of expertise that could be rapidly mobilized and which could provide the CAC countries with the support and assistance they require.

6.2 The Key Elements of the Strategic Plan

The strategy to be followed for the overall development of the CGIAR research program in CAC is:

- to concentrate on the high priority research problems as identified in collaboration with the NARS in response to CAC Government policies (as identified in section 4);
- to operate in a collaborative mode and involve other research and development agencies so as to capitalize on the widest possible range of experience and expertise;
- to select projects capable of rapid completion and of yielding technology which will have an early impact;

- to strengthen NARS leadership by capacity building to enhance self reliance, coordination, collaboration and effective planning and execution of agricultural research;
- to strengthen the linkages and enhance the levels of cooperation among CAC NARS; and
- to engage the attention of national decision-makers in order to increase the status of the research operations and therefore the level of support which will be made available in future, and to contribute to enhancing policy reform, research organization and scientific approaches.

6.3 Partnerships

A close partnership with NARS is the basis of CGIAR collaboration in agricultural research with developing countries. Collaboration between the CGIAR and CAC countries predates their independence in 1991 and through arrangements with the All Union Academy of Agricultural Sciences; it mainly focused on exchange of germplasm and scientific visits in the area. After 1991, visits to the region were maintained by certain CGIAR Centers in addition to the continued supply of improved germplasm. Later activities (see section 4) led to the establishment of the agreement to work in partnership between CGIAR and CAC-NARS and finally the decision that all Program research projects would be carried out in a partnership mode.

The decision to collectively tackle the agricultural problems facing the CAC countries resulted from an agreement among nine CGIAR Center Directors at the International Centers Week in 1997 to form a CGIAR Center Consortium for CAC. Subsequent informal discussions between Center Directors and a meeting held at ICARDA in 1998 at which both Directors and research staff were represented resulted in the formulation of the Collaborative Program. The basis for joint coordinated action is notably strengthened by the frequent interaction and the free exchange of information that is occurring at the field level between the individual scientists from different Centers who are engaged in on-going research. These complementarities among the CGIAR Centers help to generate synergy for the Program

Several coordination meetings and specialized workshops organized by ICARDA, CIMMYT, ILRI, IPGRI, IFPRI, IWMI, ICRISAT and ISNAR provided the basis for many of specific research proposals originating from within the current consortium of CGIAR Centers involved in the Program. The Program serves as an umbrella for partnership and collaboration in agricultural research for the NARS of CAC with the CGIAR.

The Program also provides an avenue for collaboration with the large number of international organizations (donor agencies, international development agencies and NGOs) operating in the CAC region with significant research and development activities directly or indirectly related to agriculture and natural resource management. e.g., World Bank, ADB, IFAD, FAO, some NGOs, and other international agricultural programs/organizations such as GL-CRSP of USAID, and USDA/ARS.

Such partnerships may take two forms: (i) other international research and development agencies or NGOs may participate as partners with projects operated within the CGIAR funded program, providing additional resources and expertise, or (ii) CGIAR partners may provide input into projects operated by other agencies, the outputs of which may contribute to

the overall aims of the CGIAR Collaborative Program. For instance, the CGIAR Collaborative Program has no funding to support activities in seed production, but ICARDA has been invited to provide consultancy advice to two international agencies; (i) an appraisal mission for seed sector investment project within the World Bank Agricultural Support Services Project in Kyrgyzstan; and (ii) a seed sector study in Kazakhstan in partnership with the COWI consultancy firm for DANIDA. Such partnerships have added to ICARDA's knowledge of the problems facing the seed sector in the region and opened potential avenues for achieving the stated aims of the Collaborative Program through partnerships with other programs. Similarly CIP is developing partnerships with USDA in Armenia, the Aga Khan Foundation in Tajikistan, Helvetas in Kyrgyzstan and with other NGOs in Armenia. Partnerships of this nature may result from individual contacts in the region, opportunistic meetings and other informal mechanisms. The collaboration between NARS working collaboratively in individual Program projects will assist in revising the linkages between countries that were weakened by the collapse of FSU, and use these links to forge research programs that are important to the region as a whole.

NGOs help to provide links with the farming community as technology is reaching its outreach stage and trials are needed on farmer's fields. Successful joint operations have been concluded with the Armenian Technology Group, the Agha Khan Foundation and CARE International.

A partnership between equal partners in the implementation of the Program is expected to have benefits in ensuring compliance with Program aims, developing complementary associations and strengthening linkages between NARS, CGIAR Centers and other research agencies. It is intended to involve some NGOs in the technology extension stages. Many of the partners will bring specialized knowledge and experience to the Program and contributions to project operations have been organized so as to involve as many as possible in each. The activities of the partners will be complementary, both at the design and the field implementation stages. Each will contribute its expertise for the successful operations of the Program and the research projects. In this way the potential for synergy has been put in place, and is expected to occur, not only among Centers but also among the NARS.

6.4 Institutional Strengthening of NARS and Mobilization of National Resources for Research

Institutional strengthening is needed at the Research System level, not only to introduce modern methods of organization and management, but also to encourage the introduction of research programs that are demand driven, field oriented and multidisciplinary in approach. In order to influence a wide range of decision makers in Government Ministries of Planning and Finance and national leaders responsible for the allocation of national funds, and stimulate greater financial allocations for the support of agricultural research the strategy will be to provide a template for change by demonstrating the results and positive impact of research, by keeping national decision makers closely informed on project progress and by raising public awareness by a series of meetings, seminars and discussions.

6.5 Expected Impact

The strategy is to operate within the national policies and plans laid down by the governments for the eight countries. Each country is in a unique stage of developing a market driven economy and this is complicated by the variability among republics in their

agricultural production systems, economic development, level of poverty and the policy decisions followed by national leaders. The agricultural economy of the region is in a state of flux. The strategy is to provide packages of technological innovations and policy changes, which are tailored to the changing situation. The vision is of a CAC with improved overall food security, income and employment: economic growth, environmental sustainability and reduced poverty. Productivity levels would be raised to levels exceeding those prior to independence, agricultural production would be diversified and the research activities of the NARS, which have been adversely affected by uncertain direction and out-dated operating modes, would be invigorated.

The strategy is to design a Program intended to serve short-term, medium-term and long-term goals. Given the urgency of the situation, the focus in the near-term will be on the transfer and adaptation of existing technologies for rapid impact on agricultural production, while at the same time strengthening the capacity of national institutions to undertake strategic research and technology generation. Focusing on adaptive research on existing technologies in benchmark sites will ensure rapid impact, which will serve to demonstrate the value of research to contribute to agricultural development and encourage further resource allocation.

In the medium-term the Program will provide the information, plans and assistance necessary for the reform of the operation and management of the CAC NARS. National agricultural development and policy planning activities will be strengthened in accordance with the move towards a market-based economy. Well-trained and well-informed research workers will raise the standard of the research efforts in national institutions, enabling them to contribute to the development of the region as a whole.

In the longer term, the Program is intended to build a strategic partnership in research between the national programs of CAC and the CGIAR Centers, and establish a program of long-term research in germplasm enhancement and natural resource management that will support both agricultural production and environmental sustainability. It will also introduce and employ biotechnology, especially molecular markers, as a modern technique in breeding and selection. A continuing partnership between CGIAR Centers and NARS will encourage the adoption of a problem-oriented research program that addresses NARS needs of the emerging privatized agricultural sector and small farmer in the region. Reforms of the agricultural research system will also include a sustainable delivery system for technology generation and transfer.

7. THE COLLABORATIVE RESEARCH PROGRAM.

A proposal entitled "Collaborative Research Program for Sustainable Agricultural Development in CAC" was developed in May 1998 by a consortium of nine CGIAR Centers involved in agricultural research development in the region (CIMMYT, CIP, ICARDA, ICRISAT, IFPRI, ILRI, IPGRI, ISNAR and IWMI) in close cooperation with the CAC-NARS. The proposal was approved by the Financial Committee of the CGIAR, and thus the collaborative Program was initiated in September 1998.

7.1 Program Objectives

Goal

The proposed Program will contribute to achieving the overall goal of food security, economic growth, environmental sustainability and poverty alleviation in the countries of Central Asia and the Caucasus.

Objectives

The immediate objective of the Program, based on NARS priorities, is to assist the CAC countries to achieve sustainable increases in the productivity of crop and livestock systems through the adaptation and transfer of production technologies, natural resource management and conservation strategies, by strengthening agricultural research and by fostering cooperation among the CAC countries and between them and international research organizations. In order to obtain a rapid impact on agricultural production, the initial emphasis is on the introduction of technologies, already tested and proved in climatically similar sites, that can be introduced in the shortest time and with the minimum need for adaptation.

Expected Outputs

- Improved productivity and sustainability of key crop production systems that are critical for food security.
- Diversification of agricultural production systems and improvement and integration of feed and livestock production.
- Strengthened national seed production programs.
- Greater water productivity through improved irrigation, drainage, and water basin management and on-farm water management strategies.
- Strengthened national plant and animal genetic resources programs, including crop, rangeland and forest resources, and domestic livestock.
- Recommendations for policy options to support national objectives in agrarian reform and agricultural development in the transition to a market economy.
- Institutional strengthening through the establishment of national agricultural research strategies and program plans, and the necessary organization and management of national research systems.
- Strengthened human resources in the region, through the provision of training, workshops, meetings and exchange visits.
- Enhanced cooperation among agricultural research and educational institutions at the national and regional level and with other relevant regional and international organizations.

The task is huge and a long-term effort will be needed to accomplish these aims. The required investment in terms of finance and manpower is beyond the resources available to CGIAR through the operation of the proposed Program. The aim would be for the Program to demonstrate the efficiency of the collaborative multidisciplinary approach to agricultural

research and to lobby both larger donor agencies and national governments in order to raise the visibility and status of research to a level that would invite increased financial support both from the national financial sources and from the donor agencies.

7.2 Strategic Research Issues

Based on an analysis of the constraints, opportunities, and NARS' priorities identified in the various consultations, meetings and workshops held with the national research programs of CAC (see sections 3, 4 and 5), participants in the meeting of CGIAR Centers in Aleppo, Syria, 27-28 April 1998, developed a matrix of research priorities according to (a) the major agroecological zones (as identified under section 3.1, above) and (b) the five major undertakings in the CGIAR research agenda. This matrix of research priorities (presented in Table 1) represents a broad and diverse research agenda. Furthermore, the research problems are often inter-related and the development of solutions necessitates a multidisciplinary research strategy that integrates crops, livestock, natural resource management and the necessary policies to support improvements. The following strategic research issues were arranged under the five major themes, which reflect the five major undertakings of the CGIAR-agreed agenda:

- (1) Productivity of Agricultural Systems**
 - 1.1 Germplasm Enhancement
 - 1.2 Strengthening National Seed Supply Systems
 - 1.3 Cropping Systems Management and Agricultural Diversification
 - 1.4 Livestock Production Systems and Integrated Feed/ Livestock Management

- (2) Natural Resource Conservation and Management**
 - 2.1 Irrigation, Drainage and Water Basin Management
 - 2.2 On-Farm Soil and Water Management
 - 2.3 Rangeland Rehabilitation and Management

- (3) Conservation and Evaluation of Genetic Resources and Biodiversity**
 - 3.1 Plant Genetic Resources
 - 3.2 Animal Genetic Resources

- (4) Socioeconomic and Public Policy Research**
 - 4.1 Constraints on the Uptake of Innovations
 - 4.2 Market Reforms
 - 4.3 Land Reforms and Common Property Rights

- (5) Strengthening National Programs**
 - 5.1 National Research Organization and Management
 - 5.2 Human Resources Development
 - 5.3 Information Technology, Data Management, Information Exchange and Networking

Table 1: Matrix of research priorities for Central Asia and the Caucasus, by agro-ecosystem and CGIAR activity (as agreed at the meeting of CG Centers, Aleppo, Syria, 27-28 April 1998).

Agro-ecosystem	LOW LANDS		RANGELANDS	MOUNTAIN	CROSS-CUTTING
	Irrigated	Rainfed			
CGIAR Activity					
Production	Cotton Wheat Rice Maize Pulses Forages Potatoes Breeding Water Productivity Production systems	Wheat Barley Forages Pulses Cattle	Small ruminant management Range rehabilitation	Wheat Barley Forages Potatoes Horticulture	Crop-livestock integration Income diversification Peri-urban agriculture Seed production
Protecting the environment: natural resource management and conservation	Salinity	Water use efficiency Wind erosion	Rehabilitation	Soils erosion by water Soil fertility	Landscape management Measurement and costing of degradation
Saving Biodiversity	Evaluation Salinity	In-situ conservation Collection On-farm conservation Evaluation	In-situ conservation Collection	In-situ conservation Collection On-farm conservation	Ex-situ conservation National documentation systems Legal frameworks
Socio-economics and policies	Water management policies				Macro & trade policies; Input/output market; Privatization; Land markets Farm economics; Property rights Community organizations; Seed sector
Institutional strengthening					Human resource development National research organization & management Information, technology National plans

8. PROGRAM MANAGEMENT AND IMPLEMENTATION

8.1 Program Management

In line with its collaborative nature, the Program is managed by a Program Steering Committee (PSC) which consists of one representative each from the nine participating CGIAR Centers², the eight CAC NARS, CGIAR, TAC, and current major donors such as World Bank, IFAD, Asian Development Bank, and USAID. The PSC, which is the highest authority for Program management, is co-chaired by one of the Directors General of the CGIAR Centers and a NARS representative from the PSC on a yearly rotation basis.

The PSC meets annually to review ongoing and new collaborative research initiatives for CAC and to ensure that they are within the framework established under the Program and do not duplicate other efforts. It provides guidance on technical matters, monitors progress, reviews the results of research and helps to resolve programmatic, operational and financial issues. It serves as a forum for the free exchange of information between all participants.

The forum includes discussion of potential projects and ensures that they are submitted to appropriate donors for financial support. The PSC is kept informed of progress in the projects, which are formulated or are underway by various CGIAR Centers in conjunction with CAC-NARS through the Program Facilitation Unit (PFU). It also arranges through PFU for the collection, analysis and dissemination of information (experiences, data and reports) from other agencies and NGOs operating projects in CAC countries that are considered to have important implications for the design, operation and modification of the Program.

The PSC is responsible for allocating those funds that are provided by CGIAR for the support of research projects (selected according to the criteria established at the first SC meeting described in section 9.2) and for the support of PFU. Additional funds may be sought by CGIAR Centers and/or NARS for specific projects that meet the aims of the overall Program and are in agreement with mandates and priorities. Each Center and/or NARS is responsible for informing the PSC, through PFU, of funding obtained in order to facilitate monitoring of the funding status for the Program as a whole. The management and monitoring of these projects will be subject to the requirements of the respective donors, but, if implemented within the overall Program, the projects will provide reports to PSC through PFU in the same manner as for the CGIAR-financed projects so that total Program activities can be monitored.

Considering its large size, the PSC will be supported by an Executive Committee (EC), which will consist of two CGIAR Center Directors (one of whom will be the chairman of the CDC Task Force and the other the Co-chair of the PSC), a PSC NARS representative from each of the Caucasus and Central Asian sub-regions (one of them will be the NARS Co-chair of PSC), one representative from TAC, and two representing major donors. The EC, which may meet more frequently than the PSC, will oversee activities relating to Program fund-raising, proposals on fund allocation and monitoring of the Program, and will report to the PSC. The EC will also follow-up on the recommendations of the PSC and will make recommendation to the CGIAR Finance Committee

² At this stage they are CIMMYT, CIP, ICARDA, ICRISAT, IFPRI, ILRI, IPGRI, ISNAR and IWMI but others may also be involved based on need and interest

8.2 Linkages with CGIAR and among CGIAR Centers

In order to maintain a linkage with the administrative and planning functions of the CGIAR system, a CDC (CG Center Directors' Committee) Task Force has been formed of four Center Directors (CIMMYT, CIP, ICARDA and ISNAR), with ICARDA's Director General as the current Chair. This Task Force is responsible for the oversight of the CGIAR inputs into the Program, liaison between the participating CGIAR Centers and the Program and the non-participating Centers, coordination of the contribution of CGIAR Centers to the Program and promoting the financial commitment of the CGIAR and the donor agencies. An important function of the Task Force is to ensure effective complementary collaboration among CGIAR Centers and that research initiatives undertaken in CAC on the identified priority topics are conducted under the umbrella of the CGIAR/CAC-NARS Collaborative Program.

8.3 Program Facilitation

A Program Facilitation Unit (PFU) supports the PSC. This consists of a unit head with minimum support staff. The annual work program and budget of PFU is approved by PSC. PFU provides secretariat support for PSC meetings, and the head of the unit reports directly to PSC. PFU is hosted by ICARDA's Regional Office for CAC in Tashkent, Uzbekistan. PFU provides support services necessary for effective use of Program resources, including organization of meetings and workshops, language translation and interpretation, internal travel arrangements, communications, etc. It functions as a central documentary and information exchange center and as a repository for Program documents and publications. PFU, in consultation with implementing institutions/agencies, shares information between Program participants and other stakeholders through a monthly "Update on Activities" and a quarterly "CAC Newsletter". It is also in the process of putting in place mechanisms for information exchange through direct contacts, brief reports, a new journal on agricultural research in CAC, and the use of appropriate information technology.

PFU serves as liaison office for research proposals between CGIAR Centers and the CAC countries. It ensures that research problems identified by NARS are presented to the appropriate CGIAR Centers (or a group of them if considered necessary) for collaborative project preparation with the NARS. It arranges for a technical appraisal of research project proposals through the appointed focal point Center (see 8.4 below), before the proposals are presented to the EC of PSC for adjudication. The focal point Center shares the responsibility with PFU for ensuring that all likely Program participants are informed of dates and locations of planning workshops so that the maximum participation in research projects is obtained. Those informed should include the participating NARS, privately owned production farms/companies, extension agencies and NGOs, all of which are expected to take an important role in the dissemination of the improved technology expected to be generated in this Program. PFU also maintains contacts with institutions conducting research activities in the CAC, which are outside this Program and funded by external agencies and by private industry.

The PFU is responsible for establishing linkages on behalf of the Program with other international agencies operating in CAC, and for identifying potential partners. The individual partners in the Program (CGIAR and NARS) are encouraged to develop potential partnerships where this is practical and feasible.

8.4 Program Implementation

The Program is implemented through projects, developed and operated according to a sequence of well-defined steps and in close cooperation with the various partners of the Program, CAC-NARS, CGIAR Centers and other research organizations, and the donors.

Each research project contributing to Program themes is coordinated by a CGIAR Center, which is designated as a "focal point". At the national level the projects involve major research and educational institutions and are managed and coordinated by national agricultural research scientists (National Coordinators - NCs). They are responsible for the implementation of the workplan, project management, and coordination of project activities. The Program relies on the full or part-time efforts of individual national scientists to implement its activities according to a preset annual workplan and budget. The work plans are developed by national scientists in multidisciplinary sessions. The proposed research plans are discussed and finalized in the annual National and Regional Coordination/Network Meetings with participation of scientists from national programs, CGIAR and other research organizations. Coordination of project activities is facilitated by regional working groups and networks. For this, an annual Regional Technical Research Coordination and Planning Meeting or other appropriate meetings by the participating Centers are organized in collaboration with NARS in alternating country locations. Collaborating scientists from the national institutions and the CGIAR Centers review the project results from past work and finalize plans for the coming season. Each research project includes a list of readily monitorable indicators of progress, either through field visits or publications. The focal point Center agrees to thus verify the progress made and report on success or failure to the PSC through PFU, according to procedures presented in 8.5, below.

8.5 Monitoring

Monitoring within the Collaborative Program is conducted at both the project and the Program level by PSC. All projects under the Program include a monitoring system designed to satisfy the requirements of stakeholders (CGIAR Centers, NARS Institutions and donor agencies). The approved project proposals include a list of monitorable output indicators and the Project Leaders together with the National Coordinators and CGIAR Center scientists are responsible for ensuring compliance with these indicators through field visits, regional traveling workshops and regular meetings with the project participants. Annual reports will be prepared for each project and copied to PFU. The schedule and a pro-forma for these reports and meetings are agreed before project implementation. At the annual co-ordination meetings the Project Leader reports on progress and achievements, the problems encountered during project implementation, identifies outputs that are ready for utilization and interacts with other projects to make sure that these outputs are integrated into the activities of other projects (e.g. new varieties into irrigation research and agronomic trials). The collaborating CGIAR Centers, donors and focal point representatives also attend the annual Coordination Meetings as seen appropriate. Additional Program monitoring will be conducted through external review mission every three years and through the external reviews periodically performed through donor agencies or the Program itself. Results of monitoring activities will be reported to PSC through PFU.

The monitoring of the Program as a whole is the responsibility of PSC, through the EC, and based on the annual reports collected by PFU. The EC reports on monitoring to PSC for final assessment. These reports include information on the linkages developed with donors and

other international organizations. Oversight of the total Program activities permits the identification of any problem areas, such as overlapping activities, lapses in interaction (within CGIAR and between CGIAR and NARS), changes in research aims etc. and enables the PSC to introduce operational changes to encourage complementarity and additional efforts to fill gaps in the research agenda.

9. CURRENT STATUS OF RESEARCH PROGRAM

9.1 Research Projects

The Collaborative Research Program is implemented through a series of projects within the themes developed in the Program document. Below, these projects are arranged in three groups:

- Those projects financed by CGIAR start-up funds in the initial phase
- Those projects currently operational and co-financed by non-CGIAR financial support
- "Pipeline" projects: these include (i) proposals prepared during the initial phase for consideration for CGIAR support and (ii) proposals prepared subsequently for CGIAR or non-CGIAR support. Some of these have already been submitted to potential donors; others are seeking financial support.

These three groups of projects (both current and planned) combine to fulfill the aims of the overall Program within the complex matrix of NARS research priorities, CGIAR mandates, CGIAR themes and overall national and regional research efforts.

Linkages between objectives (Themes), research projects, participating CGIAR Centers and the allocation of financial resources are shown in Annex 1. Project profiles are given in Annex 2.

9.2 Projects Financed by the CGIAR's Contribution

Following approval of the Program, the Program Steering Committee (PSC) in its first meeting held in Tashkent, 28-29 September 1998, reviewed submissions of project proposals for implementing the various research components of the Program. The following criteria that were agreed upon by NARS, CGIAR Centers and donors were used to identify these priorities:

- Relevance to NARS priorities
- Relevance to CGIAR themes (see 6.2)
- Contribution of specific commodity/topic to regional/national economy or institutional development
- Rapidity with which impact can be achieved by the activity
- Promotion of regional rather than bilateral activities
- Ability to build on ongoing research projects
- Contribution to capacity building
- Wide involvement of collaborators and partners

Thus, the following priority research topics were identified:

- institutional development, organization and management of national research systems;
- cropping systems improvement, including germplasm conservation and enhancement and the introduction of new rotations for agricultural diversification;
- soil and water management, including soil fertility, management of large scale irrigated systems under decollectivized systems, rehabilitation and management of areas suffering from salinization and waterlogging, efficient irrigation methods to optimize the productivity of water, and, in mountain areas, soil conservation measures to combat soil erosion by water;
- livestock production systems, including the improvement and integration of feed crop production and livestock management;
- rehabilitation and management of rangelands; and finally
- research to develop policy options to support agrarian reform and the emergence of small farmers in the transition to a market economy.

The CGIAR allocated US\$ 2 million for initial funding of the Program, US\$ 1 million to support the PFU and US\$ 1 million to support initiation of research activities in 1998/99. The PSC allocated the initial CGIAR financial support as follows:

(a) Germplasm Conservation, Adaptation, and Enhancement for Diversification and Intensification of Agricultural Production.

Implementing Centers: A consortium of five CG Centers: CIMMYT, CIP, ICARDA, ICRISAT, and IPGRI, with ICARDA as the coordinating Center.

Start up funds: US\$ 600,000

(b) On-farm Soil and Water Management for Sustainable Agricultural Systems

Implementing Center: ICARDA. Start up funds: US\$ 150,000

(c) Strengthening National Programs: National Research Organization and Management: Implementing Center: ISNAR. Start up funds: US\$ 100,000

(d) Other Activities: IFPRI, ILRI, and IWMI were provided with seed money of US\$ 50,000 each to initiate the planning and design of Socio-economic and Public Policy Research (IFPRI), Livestock Production (ILRI) and Irrigation and Watershed Management (IWMI).

Current activities supported by the CGIAR contribution and Centers' own resources include the following projects. Additional support is now sought in order that these projects and activities can be continued and the impetus for research development under the Program maintained.

Theme 1. Productivity of Agricultural Systems

Theme 1.1: Germplasm Enhancement

The project will provide access to improved germplasm for a range of crops important in the different agro-ecological areas, and assist local breeding programs to introduce and employ modern breeding techniques.

Projects: Spring Wheat (CIMMYT)	<i>Status: on-going</i>
Winter Wheat (CIMMYT/ICARDA)	<i>Status: on-going</i>
Barley (ICARDA)	<i>Status: on-going</i>
Food Legumes (chickpea, lentil, groundnut) (ICARDA/ICRISAT)	<i>Status: on going</i>
Feed legumes (<i>Vicia</i> sp. and <i>Lathyrus</i> sp.) (ICARDA)	<i>Status: on-going</i>
Potato (CIP)	<i>Status: on going</i>

Theme 1.4: Livestock Production Systems and Integrated Feed/ Livestock Management

ILRI is developing plans for research in livestock production systems, together with ICARDA and IFPRI. *Status: planning*

Theme 2. Natural Resource Conservation and Management

Theme 2.1: Irrigation, Drainage, and Water Basin Analysis

IWMI held a consultation meeting with NARS in 1999 and a proposal for activities in "Water management to improve performance of irrigation schemes in the Central Asian Republics" has been prepared. *Status: planning*

Theme 2.2: On-Farm Soil and Water Management

Application of technologies that improve water and nutrient efficiency. (ICARDA).

Status: on-going

Theme 3. Conservation and Evaluation of Genetic Resources

Theme 3.1: Plant Genetic Resources

The projects will result in the conservation and sustainable exploitation of genetic resources throughout the CAC region, through collection, exploration, sampling, seed and in-vitro storage, evaluation, documentation and development of national conservation policies.

Status: on-going

Theme 4. Socioeconomic and Public Policy Research

In collaboration with Tashkent State Agrarian University and the Ministry of Agriculture and Water Resources, Uzbekistan, IFPRI organized a regional workshop in July 1999 on "Food Agriculture, and Natural Resource Policy Research – Setting Priorities". Based on the outcome of the workshop a project proposal has been prepared *Status: planning*

Theme 5. Strengthening National Programs

Theme 5.1: National Research Organization and Management

Within its project on Transforming NARS in the Newly Independent States of CAC, ISNAR organized an expert consultation on Agricultural Research Policy, Organization and Management in Central Asia and the Caucasus in 1998 and highlights of this meeting were published in 1999. In addition ISNAR provided technical assistance support to Georgia and Kazakhstan to prepare a strategy for reform of the national agricultural research, education and extension.

The project includes the following activities:

- (i) NARS description and assessment of its strengths and weaknesses, comparative assessment of alternative NARS, and assessment of regional cooperation.

Status: on-going

- (ii) Developing national strategies for NARS reform and developing opportunities for regional networks. *Status: on-going*
- (iii) Supporting the implementation of national strategies for NARS reform and the development of regional networks. *Status: Pending*
- (iv) Summary analysis and policy recommendations. *Status: Pending*

Theme 5.2: Human Resource Development *Status: on-going*

Theme 5.3: Information Technology, Data Management, Information Exchange and Networking *Status: on-going*

All projects include on-going elements of human resource development and information exchanges, in addition to services provided Program-wide by the PFU.

9.3 Co-Financing from Non-CGIAR Sources

A major objective of the Program is to mobilize financial support from sources outside the CGIAR for support of the research priorities identified under the Program. The following projects represent co-financing to the Program by other donors. It should be noted that some projects cut across themes/sub-themes. For instance, projects on integrated feed/livestock management include aspects of range management and crop diversification; projects on on-farm soil and water management also have relevance to cropping systems management. All projects include elements of human resource development.

Theme 1. Productivity of Agricultural Systems

Theme 1.1: Germplasm Enhancement

- East European winter wheat trial. *CG Center: CIMMYT. Donor: USAID*

Theme 1.2: Strengthening National Seed Supply Systems

- Cooperation with COWI, Denmark, in a seed sector study in Kazakhstan. *CG Center: ICARDA. Donor: Danida, Denmark.*
- Cooperation with the World Bank in a seed sector investment project in Kyrgyzstan. *CG Center: ICARDA. Donor: World Bank.*
- Support to the wheat seed sector in Tajikistan –Technical assistance. *CG Center: CIMMYT. Donor: GTZ Germany.*

Theme 1.3: Cropping Systems Management and Agricultural Diversification

- Improving the Productivity, Profitability and Sustainability of the Wheat Industry in Kazakhstan. *CG Center: CIMMYT. Donor: World Bank.*

Theme 1.4: Livestock Production Systems and Integrated Feed/ Livestock Management

- Integrated feed and livestock production in the steppes of Central Asia *CG Center: ICARDA. Partners: ILRI, IFPRI, GL-CRSP. Donor: IFAD.*
- Monitoring karakul sheep flocks in Karnap range in Uzbekistan *CG Center: ICARDA. Partners: ARS-USDA/Idaho. Donor: USDA*
- Survey of karakul sheep production in Uzbekistan and Kazakhstan *CG Center: ICARDA. Partners: Univ of California, Davis. Donor: USAID GL-CRSP*

Theme 2. Natural Resource Conservation and Management

Theme 2.2 On-Farm Soil and Water Management

- On-farm soil and water management for sustainable agricultural systems in Central Asia
CG Center: ICARDA. *Donor:* Asian Development Bank.

Theme 2.3 Rangeland Rehabilitation and Management

- Monitoring of range and its vegetation in Karnap rangelands of Uzbekistan
CG Center: ICARDA. *Partners:* ARS-USDA/Idaho; University of California, Davis.
Donors: USDA and USAID GL-CRSP
- Range and Sheep Evaluation in Uzbekistan and Kazakstan,
CG Center: ICARDA. *Partners:* ARS Range Sheep Production Efficiency Unit and the ARS Forage and Range Research Laboratory). *Donor:* USDA

Theme 3. Conservation and Evaluation of Genetic Resources

Theme 3.1 Plant Genetic Resources

- Development and conservation of plant genetic resources from the Central Asian Republics.
CG Center: ICARDA. *Donor:* ACIAR, Australia.

Theme 4. Socio-economic and Public Policy Research

Theme 4.2 Market Reforms

- Study on the competitiveness of Kazakstan's wheat sector and sources of future productivity growth. *CG Center:* CIMMYT. *Donor:* World Bank.

Theme 5. Strengthening National Programs

Theme 5.1 National Research Organization and Management

- Transforming NARS in the newly independent states of CAC
CG Center: ISNAR. *Donor:* IFAD.

9.4 Pipeline Projects

Theme 1. Productivity of Agricultural Systems

Theme 1.1 Germplasm Enhancement

- Development of wheat cultivars with durable resistance to yellow rust
CG Center: ICARDA. *Partners:* CIMMYT. *Status:* Submitted for consideration by the Islamic Development Bank. Links Central Asian countries with other West Asian countries.

Theme 1.2 Strengthening National Seed Supply Systems

- Strengthening and integration of the national seed programs of Central Asia and the Caucasus. The project supports the restructuring of the seed national seed programs of the region by providing technical backstopping, interaction between national programs, exchange of information, training and advising on policy and institutional aspects of seed

supply systems. *CG Center:* ICARDA. *Status:* Submitted to 1st PSC Meeting for consideration for funding under CGIAR contribution. No funding acquired.

- CIP is involved in the development of proposals for supporting seed potato production in Armenia, Kyrgyzstan, Tajikistan. These are in planning or under discussion with a number of bilateral development institutions seeking CIP's technical support. Realistic budget estimates are not yet available as the institutions developing these projects are at different stages of the planning process. *CG Center:* CIP. *Status:* Proposals under development.

Theme 1.3 Cropping Systems Management and Agricultural Diversification

- Research and technology development to promote sustainable wheat cropping systems in Central Asia. *CG Center:* CIMMYT. *Partners:* ICARDA, IFPRI, Advanced Research Institutes. *Status:* Draft proposal developed. Some activities initiated by CIMMYT.

Theme 1.4 Livestock Production Systems and Integrated Feed/ Livestock Management

- Proposal under development by ILRI, for research in livestock production systems, including (i) increasing feed resources and improving utilization and conservation of natural resources, (ii) characterization, conservation and utilization of indigenous cattle and sheep, and (iii) analysis of policy options for enabling improved smallholder livestock production.
CG Center: ILRI. *Partners:* ICARDA and IFPRI. *Status:* under development.

Theme 2: Natural Resource Conservation and Management

Theme 2.1: Irrigation, Drainage, and Water Basin Analysis

- Water management to improve performance of irrigation schemes in the Central Asian Republics. Proposed activities include (i) institutional reforms in the irrigation sector, and (ii) water resources management, including basin hydrology, irrigation system performance, water savings in cotton production, and salinity and waterlogging
CG Center: IWMI. *Status:* Draft proposal developed. Some activities initiated by IWMI.

Theme 3. Conservation and Evaluation of Genetic Resources

Theme 3.1 Plant Genetic Resources

- In-situ/on-farm conservation of agricultural biodiversity in Central Asia.
CG Center: IPGRI. *Status:* proposal under development for submission to Global Environment Facility through OIC/COMSTECH. Some activities initiated by IPGRI.
- In-situ conservation of crop wild relatives through enhanced information management in field application. A global project which involves Armenia and Uzbekistan. *CG Center:* IPGRI. *Status:* proposal is submitted for consideration to Global Environment Facility
- Regional Documentation Network for CAC. *CG Center:* IPGRI and ICARDA. *Status:* proposal being submitted to interested donors.

Theme 4. Socioeconomic and Public Policy Research

- Public Policy Research in CAC. The project will assist in the identification and implementation of agricultural policy reforms needed for the transition from a centrally directed to a market directed economy, and also assist in the revision of agricultural

research policies in CAC countries. *CG Center*: IFPRI. *Status*: Draft proposal developed. Some activities initiated by IFPRI.

- Future productivity growth and constraints in the wheat sector- individual reports for Uzbekistan, Kyrgyzstan, and the Caucasus region.
CG Center: CIMMYT. *Status*: Activities to begin spring 2000.
- CAC regional outlook for wheat productivity and competitiveness.
CG Center: CIMMYT. *Status*: Activities to begin spring 2000.
- Farm level production structure, incentives, and technology use for wheat production in Kazakstan. *CG Center*: CIMMYT. *Status*: Draft proposal developed.

Theme 5. Strengthening National Programs

Theme 5.1 National Research Organization and Management

- Transformation of Agricultural Research Systems in the Newly Independent States of CAC. *CG Center*: ISNAR. *Status*: Proposal developed. Some activities initiated by ISNAR utilizing CGIAR start-up funds, and ISNAR core funds.

10. PROGRAM BUDGET

The original Program budget for the major themes and Program management is presented in Table 2. Out of the total budget of US\$ 15,985,500, the CGIAR Finance Committee contributed in May 1998 a total of US\$ 2 million. As indicated above these funds were used to establish the Program Facilitation Unit (PFU) and as seed money for supporting specific research activities and research management. The current status of the Program by themes, sub-themes and projects is presented in Annex 1. Additional support has been obtained from external sources but many gaps in the Program remain to be funded. A further commitment is now needed in order to maintain the projects started and to ensure the continued operation of the PFU over the next five years.

Table 2. Full CGIAR Program Budget

THEMES & ACTIVITIES	CGIAR US\$ '000	NARS US\$ '000	TOTAL US\$ '000
1. Productivity of Agricultural Systems	2,922.0	3,350.0	6,272.0
2. Natural Resource Conservation & Management	1,427.0	1,510.0	2,937.0
3. Conservation & Evaluation of Genetic Resources	926.0	1,050.0	1,976.0
4. Socioeconomic and Policy Research	434.5	450.0	884.5
5. Strengthening National Programs	1,211.0	1,260.0	2,471.0
Total for Themes	6,920.5	7,620.0	14,540.5
Program Management:			
Program Steering Committee	305.0		305.0
Program Facilitation Unit	1,140.0		1,140.0
Total Management	1,445.0		1,445.0
Total for the Program	8,365.5	7,620.0	15,985.5

11. LOOKING AHEAD

Having received approval from TAC and CGIAR the Program is already under implementation. A number of collaborative research activities, approved by the PSC in its meeting held in September 1998, have been initiated with the CAC NARS (Annex I). In addition, other activities that are relevant to the objectives of this Program have been initiated by CGIAR Centers through funds provided by donor organizations and collaborating international organizations. A number of additional projects have been developed by different CGIAR Centers (Annex 1) and are awaiting approval and others are in the process of obtaining donor support.

Program aims and procedures are not expected to change in the near future. Since funds were initially made available for a start-up phase of the Program, only a limited number of the possible projects have been implemented but the accomplishments thus far have demonstrated convincingly to the participating NARS, CGIAR Centers and donors the validity of the approach used in this Program for the development of agricultural research in CAC. Most importantly it has already attracted both the attention of the research workers, who can identify a means of producing useful results in the shortest possible time, and also the decision makers in Government Departments who are now willing to find the local finance necessary, either as additional funds or by diverting from national programs recognized as having priority levels lower than the projects listed in the Collaborative Research Program.

In order to maintain the credibility of the Program in the eyes of the CAC collaborators, additional and continuing financial support is needed from CGIAR and from the donors interested in the agricultural development of the CAC region. Program collaborators are now actively seeking additional and continuing financial support to meet the targeted budget of US\$ 15,985,500 for which the CGIAR originally contributed US\$2,000,000 as seed money. Financial commitment has been obtained totaling \$US 6,000,000 and additional funds are now sought to fill the \$US 10,000,000 financial gap (Annex 1).

Given the dynamic nature of the countries involved, in the transition from centralized to market-driven economies, the requirements of the collaborative research program will be subject to continuous adjustment and revision. The initial target budget is thus only indicative and other modes of financing will need to be investigated. Special efforts are underway to create donor awareness to the relevance and usefulness of the Program in developing sustainable national capacity in agricultural research so that it can contribute the technology for effective agricultural development.

Much will depend on the Program's continued success and the demonstration of the advantages of the procedures and processes in ensuring worthwhile research results. However the collaborative nature of the Program and the method through which the projects are designed and implemented should have several concomitant beneficial results.

- Cooperation between the CGIAR Centers will be strengthened as the combined expertise of several is brought to bear on individual priority research problems.
- Regional cooperation among NARS, exploiting complementarities and research synergy.

- National Scientists who have been working in isolation will gain knowledge, skills and confidence from their interactions with each other and with the CGIAR Centers.
- Training courses, workshops and seminars will raise skill levels further.
- Computer and language training will hasten the introduction of modern information technology and ensure that research workers appreciate the value of the inter-net and networks in enhancing their access to knowledge.
- National Agricultural Research Systems will be strengthened directly, but will also be primed to move away from the single scientist, single topic, single discipline, centrally directed approach towards a demand driven, field oriented multidisciplinary or program approach as methods of research management and organization
- The visible impact on agricultural production from the research results and improved technology produced from the Program and the progress to be made in achieving national policy goals for agriculture (food security, environmental conservation, income generation etc.) should positively influence the national decisions on the allocation of funds for supporting agricultural research.

APPENDIX 1

PROGRAM PARTNERS

NARS

<u>Country</u>	<u>Focal Institution</u>	<u>Representative</u>
Central Asia		
Kazakstan	National Academic Center for Agricultural Research (NACAR)	Prof. A. Satybaldin
Kyrgyzstan	Kyrgyz Agrarian Academy (KAA)	Acad. J. Akimaliev
Tajikistan	Tajikistan Academy of Agricultural Sciences (TAAS)	Acad. Bobo Sanginov
Turkmenistan	Ministry of Agriculture and Water Resources (MAWR)	Dr. A. Turdiev
Uzbekistan	Uzbekistan Scientific Production Center Production Center of Agriculture (USPCA)	Prof. N. Mahmudkhodjaev

The Caucasus

Armenia	Ministry of Agriculture (MoA)	Dr. L. Ruchkyan
Azerbaijan	Ministry of Agriculture (MoA)	Dr. M. Nabiev
Georgia	Georgian Academy of Agricultural Science (GAA)	Acad. V. Metreveli

CGIAR Centers

International Wheat and Maize Improvement Center (CIMMYT)	Dr. S. Rajaram
International Potato Center (CIP)	Dr. R. Cortbaoui
International Center for Agricultural Research in the Dry Areas (ICARDA)	Dr. M. Solh
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Dr. S.N. Nigam
International Food Policy Research Institute (IFPRI)	Dr. S. Babu
International Water Management Institute (IWMI)	Dr. S. Prathapar
International Livestock Research Institute (ILRI)	Dr. Ralph von Kaufmann
International Plant Genetic Resources Institute (IPGRI)	Dr. George Ayadh
International Service for National Agricultural Research (ISNAR).	Dr. Motlubar Rahman

Donor Organizations

World Bank	Dr. Jitendra Srivastava
International Fund for Agricultural Development (IFAD)	Dr. Abdelmajid Slama
USAID	Dr. John Lewis

International Organizations/Programs

GL-CRSP (USAID)	Dr. Tag Demment
USDA/ARS	Dr. Harvey Blackburn

ANNEX 1: CURRENT STATUS OF RESEARCH PROGRAM (by Theme, Sub-Theme and Projects) ¹

Table 1: Current Funding Status: Confirmed Financing of Program

Theme, Sub-Theme and Projects	Program Focal Points	Implementing Centers	Partners ²	Project Duration	Source of Funding	Financial Support	
						US\$	Duration
THEME 1. PRODUCTIVITY OF AGRICULTURAL SYSTEMS							
1.1 Agroecological Characterization, System Diagnosis and Constraint Analysis	ICARDA						
<i>Activities within projects implemented by ICARDA</i>		ICARDA			ICARDA	within other projects	
Total							
1.2 Germplasm Enhancement	CIMMYT, CIP, ICARDA, ICRISAT						
Germplasm Conservation, Adaptation and Enhancement for Diversification and Intensification of Agricultural Production in CAC							
• Spring Wheat : cultivar evaluation and multiplication		CIMMYT		5 years	CGIAR	CIMMYT: 170,000	1998/99
• Winter Wheat : cultivar evaluation and multiplication		CIMMYT/ICARDA		"	"	ICARDA: 70,000	1998/99
• Barley: cultivar evaluation and multiplication		ICARDA		"	"	ICARDA: 100,000	1998/99
• Food legumes (chickpea, groundnut, lentil): cultivar evaluation and multiplication		ICARDA /ICRISAT		"	"	ICARDA: 45,000 ICRISAT: 40,000	1998/99
• Feed legumes (vetch, lathyrus): cultivar evaluation and multiplication		ICARDA		"	"	ICARDA: 45,000	1998/99
• Potato: cultivar evaluation and multiplication		CIP		"	"	CIP: 80,000	1998/99
East European Winter Wheat Yield Trial		CIMMYT			USAID	50,000	
Total Confirmed Funding						US\$ 600,000	
1.3 Strengthening National Seed Supply Systems	ICARDA						
Seed sector study Kazakstan (COWI, Denmark)		ICARDA	COWI		Denmark	46,080	1999
Seed sector investment project, Kyrgyzstan		ICARDA	World Bank		World Bank	11,000	1999
Support to the Wheat Seed Sector in Tajikistan		CIMMYT			GTZ	150,000	
Assistance to NARS in establishing potato seed production		CIP			CGIAR start-up	see 1.2 CIP funding	1998/99
Total Confirmed Funding						US\$ 207,080	

¹ It should be noted that some projects cut across themes/sub-themes; for instance projects on integrated feed/livestock management include aspects of range management and crop diversification, projects on on-farm soil and water management also have relevance to cropping systems management. All projects include elements of human resource development. Thus, financial support by Theme are guidelines only.

² NARS are partners in all projects.

Theme, Sub-Theme and Projects	Program Focal Points	Implementing Centers	Partners ²	Project Duration	Source of Funding	Financial Support	
						US\$	Duration
1.4 Cropping Systems Management and Agricultural Diversification	ICARDA						
Improving the Productivity, Profitability and Sustainability of the Wheat Industry in Kazakstan		CIMMYT			World Bank	400,000	
Total Confirmed Funding						US\$ 400,000	
1.5 Livestock Production Systems and Integrated Feed/ Livestock Management	ICARDA / ILRI						
ILRI CGIAR start-up funds		ILRI			CGIAR start-up	50,000	1998/99
Sheep flock monitoring, Uzbekistan		ICARDA	ARS-USDA	3 years	USDA	230,955	1998-2000
Survey of sheep production, Uzbekistan & Kazakstan		ICARDA	GL-CRSP	2 years	USAID/GL-CRSP	62,800	1998-1999
Integrated Feed and Livestock Production in the Steppes of Central Asia		ICARDA	ILRI, IFPRI GL-CRSP	3 years	IFAD TAG 425	1.5 million	1999-2002
Total Confirmed Funding						US\$ 1,843,755	
THEME 2. NATURAL RESOURCE CONSERVATION AND MANAGEMENT							
2.1 Irrigation, Drainage, and Water Basin Analysis	IWMI						
Start-up/planning		IWMI		1998/99	CG start-up	50,000	1998/99
Total Confirmed Funding						US\$ 50,000	
2.2 On-Farm Soil and Water Management	ICARDA						
On-Farm Soil and Water Management		ICARDA			CG start-up	150,000	1998/99
On-Farm Soil and Water Management for Sustainable Agricultural Systems in Central Asia		ICARDA	IWMI	3 years	Asian Dev't Bank	1.2 million	2000-2002
Total Confirmed Funding						US\$ 1,350,000	
2.3 Rangeland Rehabilitation and Management	ICARDA						
Monitoring of range vegetation, Uzbekistan		ICARDA	ARS-USDA; GL-CRSP	2 years	USAID/GL-CRSP	see Theme 1.5	
Range and sheep evaluation Uzbekistan & Kazakstan Some aspects covered by IFAD project under Theme 1.5		ICARDA	ARS-USDA	3 years	USDA	see Theme 1.5	
Total Confirmed Funding							

Theme, Sub-Theme and Projects	Program Focal Points	Implementing Centers	Partners ²	Project Duration	Source of Funding	Financial Support	
						US\$	Duration
THEME 3. CONSERVATION AND EVALUATION OF GENETIC RESOURCES							
3.1 Plant Genetic Resources	IPGRI; ICARDA						
Conservation of genetic resources, crop & fodder species		IPGRI/ICARDA		5 years	CGIAR start-up	IPGRI: 30,000 ICARDA: 20,000	1998/99
Development and conservation of plant genetic resources from the Central Asian Republics		ICARDA	CLIMA Australia	3 years	ACIAR, Australia	215,000	1998-2000
Forest Genetic Resources		IPGRI		5 years	IPGRI	50,000	1999-2003
Pistachio Genetic Resources		IPGRI		2 years	IPGRI	4,000	1999-2001
Pomegranate Genetic Resources		IPGRI		2 years	IPGRI	6,000	1999-2001
Vegetable Genetic Resources		IPGRI		2 years	IPGRI	5,000	1999-2001
Total Confirmed Funding						US\$ 330,000	
3.2 Animal Genetic Resources	ICARDA/ILRI						
Total Confirmed Funding						US\$ 0	
THEME 4. SOCIOECONOMIC AND PUBLIC POLICY RESEARCH							
IFPRI start-up funding	IFPRI	IFPRI			CGIAR start-up	50,000	1998/99
Study on the Competitiveness of Kazakstan's Wheat Sector and Sources of Future Productivity Growth		CIMMYT		?	World Bank	?	
Total Confirmed Funding						US\$ 50,000	
THEME 5. STRENGTHENING NATIONAL PROGRAMS							
5.1 National Research Organization and Management	ISNAR						
<ul style="list-style-type: none"> • National research organization and management • NARS description and needs assessment • Developing national strategies for NARS reform • Summary Analysis and recommendations 		ISNAR			CGIAR start-up IFAD	CGIAR: 100,000 IFAD: 90,000	1998/99 1998/99
Total Confirmed Funding						US\$ 190,000	
5.2 Human Resource Development³	All centers/PFU						
Total Confirmed Funding							
5.3 Information Technology, Data Management, Information Exchange and Networking	All centers/PFU						
Total Confirmed Funding							

³ Elements of 5.2 Human Resource Development and 5.2 Information Exchange are included in all projects

Table 2: Summary of Current Financing by Theme

Theme & Sub-Theme	Funding (US\$)
Theme 1. Productivity of Agricultural Systems	
1.1 Agroecological Characterization, System Diagnosis and Constraint Analysis	0
1.2 Germplasm Enhancement	600,000
1.3 Strengthening National Seed Supply Systems	207,080
1.4 Cropping Systems Management and Agricultural Diversification	400,000
1.5 Livestock Production Systems and Integrated Feed/ Livestock Management	1,843,755
Total	3,050,835
Theme 2. Natural Resource Conservation and Management	
2.1 Irrigation, Drainage, and Water Basin Analysis	50,000
2.2 On-Farm Soil and Water Management	1,350,000
2.3 Rangeland Rehabilitation and Management	linked with 1.5
Total	1,400,000
Theme 3. Conservation and Evaluation of Genetic Resources	
3.1 Plant Genetic Resources	330,000
3.2 Animal Genetic Resources	0
Total	330,000
Theme 4. Socioeconomic and Public Policy Research	
Total	50,000
Theme 5. Strengthening National Programs	
5.1 National Research Organization and Management	190,000
5.2 Human Resource Development	0
5.3 Information Technology, Data Management, Information Exchange and Networking	0
Total	190,000
Support for PFU	1,000,000
PROGRAM TOTAL	6,020,835
Contribution by CGIAR	2,000,000
Contribution by other donors	4,020,835

Table 3: Pipeline projects: proposals for financing, submitted or under development.

Theme, Sub-Theme and Projects	Program Focal Points	Implementing Centers	Partners ¹	Project Duration	Proposed Source of Funding	Proposed Funding (US\$)
THEME 1. PRODUCTIVITY OF AGRICULTURAL SYSTEMS						
1.2 Germplasm Enhancement	CIMMYT, CIP, ICARDA, ICRISAT					
Germplasm Conservation, Adaptation and Enhancement for Diversification and Intensification of Agricultural Production in CAC <ul style="list-style-type: none"> • Spring Wheat : cultivar evaluation and multiplication • Winter Wheat : cultivar evaluation and multiplication • Barley: cultivar evaluation and multiplication • Food legumes (chickpea, groundnut, lentil): cultivar evaluation and multiplication • Feed legumes (vetch, lathyrus): cultivar evaluation and multiplication • Potato: cultivar evaluation and multiplication 		CIMMYT CIMMYT/ICARDA ICARDA ICARDA /ICRISAT ICARDA CIP ICRISAT ICARDA		5 years " " " " 3 years 3 years	CGIAR unidentified Islamic Devt Bank	Balance of funding requested in 1998/99: 1,025,000 459,000 1,080,000
Total Proposed Funding						US\$ 2,564,000
1.3 Strengthening National Seed Supply Systems	ICARDA					
Strengthening and Integration of the National Seed Programs of CAC		ICARDA		3 years	unidentified	1,015,000
Disease-Free Seed Potato Production System in Kyrgyzstan		CIP	Helvetas	3 years	unidentified	900,000
Production and Marketing of Potatoes in Armenia		CIP	USDA Marketing Assistance Project	3 years	unidentified	900,000
Seed Potato Production in Armenia		CIP	Under discussion	3 years	unidentified	80,000
Seed Potato Production in Tajikistan		CIP	Mountain Societies Development Program Aga Khan Foundation	3 years	unidentified	900,000
Total Proposed Funding						US\$ 3,795,000

¹ NARS are partners in all projects.

² CAC component of regional project for West Asia

Theme, Sub-Theme and Projects	Program Focal Points	Implementing Centers	Partners ¹	Project Duration	Proposed Source of Funding	Proposed Funding (US\$)
1.4 Cropping Systems Management and Agricultural Diversification	ICARDA					
Research and Technology Development to Promote Sustainable Wheat Cropping Systems in CAC		CIMMYT	ICARDA, IFPRI, ARIs	5 years	unidentified	??
Total Proposed Funding						US\$ 0
1.5 Livestock Production Systems and Integrated Feed/Livestock Management	ICARDA / ILRI					
ILRI planned activities		ILRI	ICARDA		unidentified	??
Total Proposed Funding						
THEME 2. NATURAL RESOURCE CONSERVATION AND MANAGEMENT						
2.1 Irrigation, Drainage, and Water Basin Analysis	IWMI					
Irrigation and Drainage Management in the Central Asian region		IWMI		5 years		total 1,940,990
• Water management in the Fergana Valley		IWMI		3 years	SDC Switzerland	900,000
• Water management to improve performance of irrigation schemes in the Central Asian Republics		IWMI		2 years	unidentified	300,000
Total Proposed Funding						US\$ 1,940,990
2.2 On-Farm Soil and Water Management	ICARDA					
Total Proposed Funding						
2.3 Rangeland Rehabilitation and Management	ICARDA					
Total Proposed Funding						
THEME 3. CONSERVATION AND EVALUATION OF GENETIC RESOURCES						
3.1 Plant Genetic Resources	IPGRI; ICARDA					
<i>In situ/on-farm</i> Conservation of Agricultural Biodiversity in C. Asia		IPGRI	OIC-COMSTECH	5 years	GEF	4,000,000
<i>In situ</i> conservation of crop wild relatives through enhanced information management in field application		IPGRI	FAO	5 years	GEF/FAO	2,134,000
Total Proposed Funding						US\$ 6,134,000
3.2 Animal Genetic Resources	ICARDA/ILRI					
ILRI plans		ILRI		?	?	?
Total Proposed Funding						US\$ 0

Theme, Sub-Theme and Projects	Program Focal Points	Implementing Centers	Partners ¹	Project Duration	Proposed Source of Funding	Proposed Funding (US\$)
THEME 4. SOCIOECONOMIC AND PUBLIC POLICY RESEARCH						
	IFPRI					
Policy Research in CAC		IFPRI		3 years	unidentified	600,000
Future Productivity Growth and Constraints in the Wheat Sector - Individual Reports for Uzbekistan, Kyrgyzstan and the Caucasus Region		CIMMYT		start 2000	unidentified	?
CAC Regional Outlook for Wheat Productivity and Competitiveness		CIMMYT		start 2000	unidentified	?
Farm Level Production Structure, Incentives and Technology Use for Wheat production in Kazakstan		CIMMYT		start 2000	unidentified	?
Total Proposed Funding						US\$ 600,000
THEME 5. STRENGTHENING NATIONAL PROGRAMS						
5.1 National Research Organization and Management	ISNAR					
<ul style="list-style-type: none"> • National research organization and management • NARS description and needs assessment • Developing national strategies for NARS reform • Summary Analysis and recommendations 		ISNAR			unidentified	948,000
Total Proposed Funding						US\$ 948,000
5.2 Human Resource Development³	All centers/PFU					
Total Proposed Funding						
5.3 Information Technology, Data Management, Information Exchange and Networking	All centers/PFU					
Total Proposed Funding						

³ Elements of 5.2 Human Resource Development and 5.2 Information Exchange are included in all projects

Table 4: Summary of Pipeline Projects (Financing not Acquired)

Theme, Sub-Theme and Project	Proposed Financing (US\$)
Theme 1. Productivity of Agricultural Systems	
1.1 Agroecological Characterization, System Diagnosis and Constraint Analysis	0
1.2 Germplasm Enhancement	2,564,000
1.3 Strengthening National Seed Supply Systems	3,795,000
1.4 Cropping Systems Management and Agricultural Diversification	0
1.5 Livestock Production Systems and Integrated Feed/ Livestock Management	0
Total	6,359,000
Theme 2. Natural Resource Conservation and Management	
2.1 Irrigation, Drainage, and Water Basin Analysis	1,940,990
2.2 On-Farm Soil and Water Management	0
2.3 Rangeland Rehabilitation and Management	0
Total	1,940,000
Theme 3. Conservation and Evaluation of Genetic Resources	
3.1 Plant Genetic Resources	6,134,000
3.2 Animal Genetic Resources	0
Total	6,134,000
Theme 4. Socioeconomic and Public Policy Research	
Total	600,000
Theme 5. Strengthening National Programs	
Total	948,000
Total Proposed Research Funding	US\$ 15,981,000

ANNEX 2

PROJECT PROFILES

This Annex contains draft profiles for CGIAR financed projects grouped under the Theme headings as follows:

(1) Productivity of Agricultural Systems

- Germplasm Enhancement (Focal point: ICARDA): CGIAR financing
- Integrated feed and Livestock production in the steppes of Central Asia (Focal point ICARDA): non-CGIAR financing
- Livestock Production Systems and Integrated Feed/Livestock Management (Focal point ILRI)¹: CGIAR financing for planning phase

(2) Natural Resource Conservation and Management

- Irrigation, Drainage and Water Basin Management (Focal point IWMI): CGIAR financing for planning phase
- On-Farm Soil and Water Management (Focal Point ICARDA): CGIAR start-up financing; non-CGIAR co-financing.

(3) Conservation and Evaluation of Genetic Resources and Biodiversity

- Conservation of Plant Genetic Diversity as the Basis for Germplasm Improvement (Focal point IPGRI, ICARDA): CGIAR financing
- Conservation of Forest Genetic Resources (Focal point IPGRI): CGIAR financing

(4) Socioeconomic and Public Policy Research

- Production and Marketing Policy Reforms (Focal Point IFPRI): CGIAR financing for planning phase

(5) Strengthening National Programs

- National Research Organization and Management (Focal point ISNAR): CGIAR financing; non-CGIAR co-financing

¹ The ILRI project is cross-linked with sub-themes (1) Conservation of Animal Genetic Resources and (2) Rangeland Rehabilitation and Management

PROJECT PROFILE

THEME 1:	PRODUCTIVITY OF AGRICULTURAL SYSTEMS
SUB-THEME 1.1:	GERMPLASM ENHANCEMENT
Project:	Germplasm Enhancement for Diversification and Intensification of Agricultural Production
Status	Early implementation stage
Focal Point	ICARDA (as a coordinating center for the total activity); other focal points are commodity based
Collaborating Centers	ICARDA, CIMMYT, CIP, ICRISAT, and IPGRI.
National Partners	Kazak Research Institute (KRI) for Cropping Systems; KRI of Cereal Husbandry; KRI of Forages and Pastures; KRI of Vegetables & Potatoes Uzbek Research Institute (URI) of Cereal Husbandry; URI of Cereal Husbandry under Irrigation; URI of Animal Husbandry; URI of Vegetables and Potatoes TARI; Kyrgyz Research Institute (KgzRI) of Cropping Systems; KgzRI of Forage & Pasture; TAAS; AASRI (Azerbaijan); DRE-MoA; GAAS.

Background

The national agricultural research systems (NARS) of the CAC region have identified crop improvement as one of its highest priorities. Given its importance, both in area and for food security, most NARS gave priority to wheat. Other crops, that have received little attention in the past, are now being given priority as alternative crops for agricultural diversification, including barley, especially in drier areas, food legumes, forage legumes and other feed crops, and oilseeds. The second food crop that had emerged as a priority crop in the meeting of CAC representatives in Tashkent is the potato which has begun to establish itself as an especially important crop in the smallholdings now in the process of formation.

A major constraint to improving agricultural production is the lack of access to germplasm. With the breakup of the former USSR, the centralized system for the breeding and release of crop cultivars has disappeared leaving CAC countries with no access to new improved cultivars or, in some cases, without a supply of existing varieties. Consequently, all national programs give high priority to the need for support to national breeding programs in the development of improved germplasm. For the well-established crops the major objectives of a collaborative program in germplasm improvement is the rapid identification of suitably adapted cultivars and their multiplication for immediate release, followed by a breeding program aimed at producing new high-yielding and stress resistant/tolerant cultivars suitable for the CAC agroecological regions.

The immediate aim is to evaluate available germplasm that can be utilized immediately and thereby have a rapid impact on productivity, but a longer term goal is to support the development of sustainable national breeding programs through the transfer of advanced research techniques, such as molecular genetics and the use of molecular markers in plant breeding.

Sub-Project 1:	Spring Wheat
Focal point:	CIMMYT
Activity 1.	Provision of cultivars for evaluation and multiplication
Output	Rapid availability of high yielding ecologically adapted varieties
Activity 2	Transfer of advanced breeding techniques
Output	Efficient research/breeding programs and improved scientific skills
Sub-Project 2:	Winter Wheat
Focal Point	CIMMYT, ICARDA.
Activity 1.	Provision of cultivars for evaluation and multiplication
Output	Rapid availability of high yielding ecologically adapted varieties
Activity 2	Transfer of advanced breeding techniques
Output	Efficient research/breeding programs and improved scientific skills

Sub-Project 3: Barley
 Focal Point ICARDA
Activity 1 Provision of cultivars for evaluation and multiplication
 Output Rapid availability of high yielding ecologically adapted varieties
Sub-project 2 Transfer of advanced breeding techniques
 Output Efficient research/breeding programs and improved scientific skills

Sub-Project 4: Food Legumes (Chickpea, groundnut and Lentil)
 Focal Point ICARDA & ICRISAT
Activity 1 Provision of cultivars for evaluation and multiplication.
 Output Rapid availability of high yielding ecologically adapted varieties

Sub-Project: 5 Feed legumes (vetches and others)
 Focal Point ICARDA
Activity 1 Provision of cultivars for evaluation and multiplication.
 Output Rapid availability of high yielding ecologically adapted varieties

Sub-Project 6: Potato
 Focal Point CIP
Activity 1 Provision of cultivars for evaluation, rapid multiplication and ecologically sustainable production.
 Output Rapid availability of high yielding adapted varieties and ecologically sound production systems with the inclusion of Integrated Pest Management (IPM) practices
Activity 2 Transfer of advanced breeding techniques and seed production systems
 Output Efficient research/breeding and seed programs with a wide range of up-to-date diagnostic and phytosanitary tools and in-vitro techniques. Improved scientific skills

Gains: Increased sustainable productivity of a range of crops, resulting in food security, lower food prices, improved nutrition, economic development, release of land for diversification into other crops and enterprises, reduced imports and increased export earnings.

Users: Initially national extension and education services but through these agencies, both the small scale and subsistence small holders and the larger scale cooperative farms. Livestock owners will benefit from the introduction of improved feed species.

Milestones passed:

Spring wheat: CIMMYT and NACAR set up joint research program and an office at Almaty
 Computer and language training courses completed
 Study visits to CIMMYT completed
 Traveling seminar to Kazakhstan completed
 National Workshop on cereal breeding conducted in Tajikistan
 Spring wheat improvement network established

Winter wheat: CAC WWINET established 1999
 Improved germplasm provided and evaluated by NARS
 Disease survey completed and yellow rust nursery established
 Computer and language courses completed
 Traveling workshop to Turkey completed
 On-farm demonstration plots established

Barley: Barley nurseries established 1999
 Study visit to ICARDA, Turkey and Krasnodar
 Spring barley variety released in Armenia
 Computer and language courses completed

Food legumes: Chickpea and lentil nurseries established.
Study visit to ICARDA completed for scientist from Azerbaijan, Kyrgyzstan and Uzbekistan
Training tours by ICARDA specialists to Azerbaijan, Kyrgyzstan and Uzbekistan
Study at ICRISAT completed for three scientists in groundnut breeding 1999
Workshop for groundnut organized by ICRISAT

Feed legumes: 130 accessions of vetch provided to Kazakhstan, Kyrgyzstan and Uzbekistan
Training tour by ICARDA specialists to Kazakhstan, Kyrgyzstan and Uzbekistan

Potato: Training workshop completed on germplasm and seed production for all eight republics in Poland
Visit of CIP Regional Coordinator to the region

Monitorable milestones:

- Delivery of new accessions to 8 CAC countries
- Establishment of nurseries and evaluation trials
- Date of hand-over of selected germplasm to national variety testing organizations
- Date of release of new cultivars
- Technology training completed
- Seminars and workshops completed and proceedings published
- Network set up and functioning
- Seed production and on-farm verification trials established

Area /system benefiting:

Spring wheat: All CAC countries but especially rain fed farming systems in Kazakhstan
Winter wheat: Both irrigated and rainfed farming systems in Kazakhstan Uzbekistan, Tajikistan, Kyrgyzstan, Armenia, Georgia and Azerbaijan
Spring Barley: Rainfed farming systems in Kazakhstan, Armenia, Kyrgyzstan, and Tajikistan.
Winter Barley: The continental highlands of CAC countries
Food legumes: All 8 CAC republics
Feed legumes: Uzbekistan, Kyrgyzstan, Kazakhstan, Armenia, Georgia Azerbaijan
Potatoes: Uzbekistan, Kyrgyzstan, Kazakhstan Armenia, Georgia and Tajikistan for seed production

Duration : 5 years

Cost: US\$ 1,575,000

Financing: CGIAR: US\$ 500,000 start-up funds 1998/99
NARS in-kind contributions
CG Centers in-kind contributions

PROJECT PROFILE

THEME 1:	NATURAL RESOURCE CONSERVATION AND MANAGEMENT
SUB-THEME 1.4:	LIVESTOCK PRODUCTION SYSTEMS AND INTEGRATED FEED/LIVESTOCK MANAGEMENT
Project:	Integrated Feed and Livestock Production in the Steppes of Central Asia
Status	Early implementation
Focal Point	ICARDA
Collaborating Centers	ILRI, IFPRI, GL-CRSP
National Partners	NACAR, USPCA, KAA, TARI

Background: Smallholder livestock owners require assistance to improve production through both on-farm feed production and rehabilitation and management of rangelands. Experience and technology available in similar agro-climatic zones can be adapted to the conditions within CAC can be rapidly introduced so as to promote the development of sustainable and productive livestock production systems.

Objectives:

- Characterization and problem diagnosis of newly emerging small ruminant production systems
- Constraint analysis of markets and analysis of market potentials to reorient production systems and identify solutions to market problems
- On-farm adaptive research with active involvement of farmers to improve livestock production
- Adequate utilization of feed resources and increasing production of the feed base
- Efficient livestock production by applying adequate flock management practices integrating nutrition, reproduction, breeding and animal health

Outputs:

- Fodder species adapted to the local conditions identified and grown in rotations with wheat or barley crop
- Appropriate stocking rates and seasons of use of local and alternative fodder crops used
- Appropriate multi-purpose shrubs and trees for rangeland improvement identified
- Low-cost techniques for the rehabilitation of rangelands and of marginal lands in arable areas.
- Information on the utilization of forage crops in combination with other feed resources for small ruminants
- NARS scientists trained in the use of appropriate socioeconomic analysis and modeling tools. Methods of feed production and utilization, range rehabilitation and range and small ruminant management

Milestones

- Management options for range-livestock-cropping systems identified
- Appropriate plant material for the main crop rotations identified
- Maps produced showing range type, productivity and season of use with optional stocking rates.
- Low-cost and low-input reseeding and regeneration techniques introduced
- Leaflets published on improved small ruminant nutritional practices
- Training completed for a team of scientists from each country to enable them to lead the project

Areas/systems benefiting: Livestock farmers in the steppe regions of Central Asia

Duration: Three years: 1999-2002

Financing: International Fund for Agricultural Development (IFAD): US\$ 1.5 million
NARS in-kind contributions
CG Centers in-kind contributions

PROJECT PROFILE

THEME 1:	PRODUCTIVITY OF AGRICULTURAL SYSTEMS
SUB-THEME 1.4:	LIVESTOCK PRODUCTION SYSTEMS AND INTEGRATED FEED/LIVESTOCK MANAGEMENT
Status	Planning
Focal Point	ILRI
Collaborating Centers	ILRI, ICARDA and IFPRI
Other Collaborators	GL-CRSP
National Partners	NARS of all 8 republics

Background

Smallholder needs and constraints to livestock development were identified and prioritized by NARS, ILRI, ICARDA and IFPRI in 1999. A collaborative program was then designed by NARS, ILRI, ICARDA and IFPRI, for research in the following priority areas (1) Increasing feed resources and improving utilization and conservation of natural resources, (2) Characterization, conservation and utilization of locally adapted and indigenous cattle and sheep breeds, and (3) Analysis of policy options to create enabling environments for improved smallholder livestock production and marketing.

These three priority areas have been incorporated as activities in a research program aimed at the development of smallholder livestock production in Central Asia and the Caucasus. The Program is a long-term undertaking and during this first phase critical feed needs will be assessed, invaluable germplasm protected from extinction, and improved policy and marketing environments created for the adoption of innovations.

Sub-Project 1. Increasing feed resources and improving utilization and conservation of natural resources

- Activity 1.** Documentation of scientific human and institutional resources, and review key papers.
Output: Inventory of resources
- Activity 2.** Develop options for growing, harvesting and feeding sown forage crops designed for smallholders. Integrate crop and livestock production, and grazing of arid/semi-arid rangelands and mountain areas.
Output : Improved Feed/livestock production
- Activity 3.** Document the total area, condition, and livestock densities of major rangeland types across selected countries on a district (ration) and watershed basis and improve their ability to sustain and contribute to the needs of smallholder livestock.
Output Inventory of livestock and rangeland use
- Activity 4.** Analyze the demand for different animal feeds, and relate it to the domestic production of concentrates, crop residues and agro-industrial by-products.
Output: Information on needs for animal feeds
- Activity 5.** Train national scientists in collaborative research oriented to smallholder livestock production and link them to the international research community for continued self-sustaining capacity development.
Output: Improved skill of NARS livestock scientists

Sub-Project 2 Characterization, conservation and utilization of indigenous cattle and sheep breeds

- Activity 1.** Study and document the history, breadth, number, and distribution of ruminants in relation to changes in populations resulting from privatisation and transition to market economies, and characterize their production, adaptation and genotypes.

Activity 2. Perform molecular characterization of selected breeds of strategic regional and international importance.

Activity 3. Strengthen national capacity in the characterization, management and conservation of locally adapted and indigenous breeds in the context of serving the variety of production systems that are emerging, with emphasis on smallholder units.

Sub-Project 3. Analysis of policy options for creating enabling environments for improved smallholder livestock production and natural resource management

Activity 1. Analyze and identify policy constraints and alternatives for uptake of technologies for feed production and natural resource conservation.

Activity 2. Analyze domestic demand for and consumption of edible and non-edible animal products in rural and urban areas.

Activity 3. Examine the nature, behaviour and performance of main marketing chains for animal products, and quantify the prices and the margins between producer and retailer over time.

Activity 4. Strengthen institutional capacity in survey techniques, policy analysis, identification and implementation of effective policies for the livestock sector, marketing and adding of value to animal products.

Gains The main beneficiaries in this first phase will be the NARS, which will gain detailed inventortized knowledge of national resources and animal breed characteristics. Ministry of Agriculture will be able to use the research findings to produce policies for feed production, marketing and meeting the needs of the newly emerging small-scale livestock owner.

Milestones

- Publication of resource inventories
- Publish recommendations for integrated production of crops and livestock
- Publish descriptions of national livestock breeds
- Policy papers on feed production and marketing

Area/system benefiting: Mainly the semi arid and rangeland regions of CAC

Cost: USS

Duration: 4 years

Financing: CGIAR: USS 50,000 start-up funds 1998/99

PROJECT PROFILE

THEME 2:	NATURAL RESOURCE CONSERVATION AND MANAGEMENT
SUB-THEME 2.1:	IRRIGATION DRAINAGE AND WATER BASIN MANAGEMENT
Status	Planning
Focal Point	IWMI
National Partners	SIC-ICWC and other NARS as appropriate

Background: The centralized management of the water resources in the CAC region has been replaced by an interstate Coordination Water Commission of Central Asia but there is no evidence of a coherent institutional framework for water management within the Republics. Institutional reform is needed coupled with information on the management of diversions, recycling, and salinity. A research based strategy and policy re-formulation are needed, based a participatory approach that involves the users and suppliers of water.

Project 1: Water Resource Institutions in the Central Asian Countries

Activities:

- Analyze roles and responsibilities of institutions involved in water resource management
- Testing the possibility of organizing farmers in the former collective farms into Water User Associations that are responsible for the operation and maintenance of irrigation and drainage infrastructure in a financially viable manner.
- Evaluate the potential for new water resource institutions along hydrologic boundaries of irrigation districts.

Project 2: Agricultural and Environmental Performance of Irrigation Districts in the Central Asian Countries.

Activities:

- Analyze water use distribution, agricultural productivity and the extent of water logging and salinization in selected irrigation districts using remote sensing images
- Determine opportunities for real water savings in cotton considering on-farm and off-farm constraints in a selected irrigation district.

Milestones

- Workshop to present information from surveys and analyses completed (2000)
- Workshops held in each republic to develop institutional frameworks for the adoption of water saving methods (2001)
- Publication of hydrological models (2001)
- Installation of a remote sensing unit (2003)
- Train staff in remote sensing techniques (2003)
- Water management reforms implemented (2004)

Gains Reduced water usage for cropping with resulting lower production costs. Rehabilitation of severely degraded irrigation areas

Users Information will be used by national agricultural and water policy makers to the benefit of the farmers in the irrigated areas.

Areas/systems benefiting: The irrigated farming areas in all CAC republics and farming systems within defined water basins.

Duration: Five years.

Total Cost: \$US 1,940,990.

Financing plan: CGIAR start-up funds 1998/99: US\$ 50,000

Project 1: SDC pipeline: US\$ 900,000 for 3 year

Project 2: CGIAR pipeline: US\$ 300,000 for 2 years

PROJECT PROFILE

THEME 2:	NATURAL RESOURCE CONSERVATION AND MANAGEMENT
SUB-THEME 2.2:	ON-FARM SOIL AND WATER MANAGEMENT
Project:	On-Farm Soil and Water Management for Sustainable Agricultural Systems in Central Asia
Status	Early implementation/Planning
Focal Point	ICARDA
Collaborating Centers	IWMI
National Partners	NACAR, KAA, USPCA, MSTD-MAWM, TAAS, MDSSENT-MoA, GDSREA-MoA, DRE-MoA, GAAS

Background

During the First Regional Central Asia/ICARDA Coordination Meeting, in September 1997, discussions on on-farm soil and water management focused on two main areas: (i) improvement of the productivity of water through improved water management, irrigation methods, soil fertility, cropping systems, tillage and weed control and (ii) application of measures for controlling salinity in irrigated areas, such as improved drainage, crop varieties, irrigation scheduling and application methods. This project addresses the problems of farm-level soil and water management, not simply to conserve these resources, but in order to increase agricultural production through maintaining soil fertility, enhancing nutrient-use efficiency and improving the productivity of water. The objectives of this project are (1) increased agricultural production from improved management of cropping systems, including the optimal use of available water resources (both rainfall and irrigation sources) and improved management of soils and nutrients that ensures the maintenance of soil fertility, and (2) sustainable irrigated cropping systems through appropriate farm-level management of irrigation and drainage, and the safe utilization of marginal water sources for irrigation.

Component 1: Soil, water, crop management.

Outputs:

- 1.1 Improved management principles, with respect to crop yield, productivity of water, and nutrient-use efficiency, that will guide choice of crop, crop rotation, input use, and soil and crop husbandry.
- 1.2 On-farm tested water, soil and crop management practices for further dissemination to farmers.

Component 2: Farm-level irrigation and drainage management.

Outputs:

- 2.1 Analysis of the major factors that affect on-farm soil and water quality and condition in areas that are currently affected by, or are susceptible to, salinization.
- 2.2 Improved management principles for farm-level irrigation and drainage within irrigated cropping systems.
- 2.3 On-farm tested techniques for irrigation and drainage that increase productivity while maintaining soil and water quality in irrigated systems.

Component 3: Utilization of marginal water.

Outputs:

- 3.1 Assessment of the potential for marginal water use within the study area over the next two decades.
- 3.2 Guidelines for the safe and environmentally sound use of marginal water in irrigation, including techniques that optimize the conjunctive use of marginal water, rainwater, and other available water sources, including selection of appropriate sites, crops, irrigation systems, drainage systems, soil and water management techniques, and operational management.

Component 4: Capacity building

Outputs:

- 4.1 Skilled and qualified national researchers in soil and water management.
- 4.2 Integration of soil and water resource management into national development programs

Gains Agricultural intensification and crop diversification, seen as key strategies for the more efficient use of land and water in Central Asia.

Milestones

- At least one major farming system in each country assessed and options for appropriate management and production practices adapted and tested under farmers' management at least one pilot site per farming system.
- Best-bet practices identified from on-farm testing for further dissemination to farmers in target areas.
- An understanding of the current constraints and identification of opportunities for intervention, based on analysis of two-three sites having typical or potential salinity problems
- Establishment of most appropriate management principles and practices for 4-5 major irrigated farming systems in the region
- Management and production practices adapted and tested under farmers' management at at least one pilot site per farming system.
- Identification of one or two sites for brackish water, and one or two sites for treated effluent water, (development project areas) for development of marginal water sources for irrigation
- Documented guidelines for the appropriate management of marginal water in identified sites
- 200-300 NARS personnel will receive training through at least 8 formal training courses, individual long-term training, and on-the-job training
- Regional workshops and annual coordination meetings to develop national and regional research strategies.
- Participation of national decision makers and research directors in above workshops and meetings.

Areas/systems benefiting. *Farmers in rainfed and irrigated cropping systems.*

Duration: Four years: start-up phase 1998/99; three years: 2000-2002

Financing: CGIAR start-up 1998/999: US\$ 150,000
Asian Development Bank: US\$ 1.2 million:
NARS in-kind contributions
CGIAR Center in-kind contributions

PROJECT PROFILE

THEME 3:	CONSERVATION AND EVALUATION OF GENETIC RESOURCES AND BIODIVERSITY
SUB-THEME 3.1:	PLANT GENETIC RESOURCES: GERMPLASM COLLECTION, CONSERVATION, AND EVALUATION
Project 1.	Conservation of Plant Genetic Diversity as the Basis for Germplasm Improvement: Field Crops
Status	Early implementation/planning stage
Focal Point	IPGRI, ICARDA
Collaborating Centers	CIMMYT, ICRISAT, CIP
National Partners	NACAR; USPCA; KAA; TAAS; TARI; AASRI/DRI; DRE-MoA; GAAS

Background

The CAC Republics are the center of origin of a number of important crops and possess a wealth of plant genetic resources, including crop progenitors, wild relatives and locally adapted cultivars and landraces. Species used for forage (either grazed or as conserved as hay) are also important since the expansion of crop area is diverting grazing to rangelands that are now deteriorating due to the increased grazing pressure. In addition to the need to conserve crop germplasm, conservation is therefore needed for these leguminous crops and forage species before they are eliminated from the range.

The genetic resource base of the Central Asian and Caucasian Republics is still largely unused by the countries for research or development. The same political and structural changes associated with the transition to a market based economy have left the germplasm improvement programs seriously under-resourced and entirely dependent on introduced germplasm. The germplasm base in European collections from these republics is slight, despite their being a center of diversity of a number of key cereal, grain legume, vegetables and fruit species and coverage of this region in CGIAR gene banks is generally sparse. There is thus a major need to develop, conserve and exploit the abundant, but eroding genetic resources of cereals, pasture, forage, rangeland, grain legume, vegetable and fruit species of value to these regions. All countries in the region appreciate the dangers of land and genetic resource degradation and the urgent need to arrest it. They also have institutional and technical expertise for developing plant genetic resources but all lack the resources for a nationally or regionally coordinated approach.

Activities:

- Inventorying, exploration, surveying and sampling of plant genetic resources
- Establishment of national and regional ex situ conservation facilities, including seed and in vitro storage and field gene banks.
- In situ and on-farm management of plant genetic resources
- Multiplication, regeneration, characterization and evaluation of ex situ germplasm collections
- Establishment of national PGR documentation units within national programs
- Development of national policy, legal and institutional frameworks for the effective conservation and sustainable use of plant genetic resources.

Milestones passed

- Coordination Committee Meeting CATCN-PGR was held in 1999.
- Germplasm documentation unit established in the Uzbekistan Research Institute of Plant Industry (URIP) 1998
- A collection mission for cereals and food legumes in Uzbekistan and Armenia, and feed legumes in Turkmenistan completed 1998.
- Workshop on PGR Documentation for eight CAC countries completed 1999.
- Collection mission on vegetable crops in Uzbekistan was conducted in 1999.
- Central Asian and Transcaucasian Network on Plant Genetic Resources is established

- A scientist from Georgia was trained on Seed Bank Management.
- A scientist from Uzbekistan was trained on Use of Molecular Markers on the Biodiversity Studies.
- IPGRI's training support materials on ecogeographic survey and collecting was published in Russian
- Data base on the institutions holding and dealing with PGR in the region completed.

Monitorable Milestones

- Survey, characterization and strengthening of conservation of melons genetic diversity through germplasm catalogue.
- Workshop on Fruits/Vegetables.
- Central Asian course.

Areas/systems benefiting: all CAC countries

Cost

Duration: 5 years

Financing: CGIAR start-up funds 1998/99: US\$ 50,000
 NARS in-kind contributions
 CG Centers in-kind contributions

PROJECT PROFILE

THEME 3:	CONSERVATION AND EVALUATION OF GENETIC RESOURCES AND BIODIVERSITY
SUB-THEME 3.1:	PLANT GENETIC RESOURCES
Project 2:	Conservation of Forest Genetic Resources
Status	Implementation
Focal Point	IPGRI
National Partners	NACAR; USPCA; KAA; TAAS; TARI; AASRI/DRI; DRE-MoA; GAAS; Regional and National Working Groups on Forest Genetic Resources of CATCN-PGR

Background The expansion of crop area is resulting in increased pressure on range, forest and woodland, not only for animal feed but for also building materials and fuel. As this pressure mounts there is a pressing need to conserve (both in vitro and in vivo) the unique forest species of the CAC region

Activities:

- Development of policies and legislative frameworks to support sustainable management of FGR
- Establishment of monitoring systems for biodiversity in forest ecosystems
- Development of methods for the integrated conservation of priority species
- Development of guidelines for regeneration, restoration of threatened and rare species
- Establishment of quarantine and introduction monitoring systems
- Establishment of a database on forest genetic resources in Central Asia

Milestones passed

- Regional and national working groups on forest genetic resources in framework of CATCN-PGR are established
- Priority forest species on regional level are identified
- National Programs on forest genetic resources conservation and sustainable use are developed
- Data base on forest genetic resources has been compiling
- Second meeting of Forest Genetic Resources Working Group 1999
- PFU Forest genetic resources scientist was recruited and has started his job on coordination of the activities in Central Asia and the Caucasus region.

Monitorable Milestones

- Survey, characterization, collecting and evaluation *Pistacia* genetic diversity in Central Asia
- Survey, characterization, collecting and evaluation *Pyrus* genetic diversity in Central Asia
- Survey, characterization, collecting and evaluation *Punica granatum* genetic diversity in Central Asia
- Publication of methodologies on assessment of intraspecific and interspecific genetic diversity of priority forest species in Central Asia
- Development of regional strategy on conservation and sustainable use of forest genetic resources.
- Regional Data Base on Forest Genetic Resources will be completed and made it accessible on Internet.
- On job training on ecogeographic survey collecting and characterization of genetic diversity.
- WANA and CAC Interregional Planning Meeting on Pomegranate in Tunisia.

Areas/systems benefiting: Mountain and arid ecosystems in the region

Cost:

Duration: 5 years

Financing:

PROJECT PROFILE

THEME 4:	SOCIOECONOMIC AND PUBLIC POLICY RESEARCH
Project:	Food and Agricultural Policy Research and Capacity Strengthening in Uzbekistan and Establishment of a Policy Network in Central Asia
Status	Planning
Focal Point	IFPRI
Collaborating Centers	ICARDA, ILRI, CIMMYT
National Partners	8 NARS of CAC

Background. Following the breakup of FSU and the removal of central direction the republics of CAC are facing difficulties in defining policies for guiding the direction of agriculture in the face of the re-emergence of a small farming production sector and the need for national food security and poverty alleviation. The project would generate information for food and agricultural policy reforms including a database for policy analysis and establish appropriate mechanisms for dissemination of such information. Three 3-week training courses will be organized on food and agricultural policy analysis for analysts, Universities, Economic research centers and other related agencies. Two national workshops and one regional workshop will be arranged for the presentation of research results and the exchange of experiences between project collaborators and policy analysts in the region. Dissemination activities will also involve briefings, a web page and monthly reports on project activities, all directed to government agencies, farmers, other organizations, the private sector and donors.

Goal: Generate information for food and agricultural policy reforms including a database for policy analysis and establish appropriate mechanisms for dissemination of such information.

Indicators: A set of policy alternatives that emanate from the project and the policy communication channels established as part of the project.

Purpose: Undertake a set of policy studies and capacity strengthening activities in the CAC region using Uzbekistan as a case study.

Indicators: Policy research studies conducted in line with the priorities set for the region and the number of training activities implemented during the project period.

Outputs: The outputs of the project will include policy research studies and a database for continued policy analysis in the region.

Indicators: Policy research reports, policy briefs, data sets organized, and number of trained policy analysts.

Activities:

Research: Policy studies on (i) food security and agricultural diversification, (ii) on agro-industry and market systems development, and (iii) sustainable use of water and rangelands. Development of a database of indicators based on a combination of field data and secondary data.

Training: Three training courses on food and agricultural policy analysis for a core group of analysts belonging to Ministry of Agriculture, Tashkent Agrarian University, Center for Economic Research, and other related agencies. The training will be organized in modules, each module focused on a specific topic (such as supply response, demand analysis, market structure-conduct-performance, natural resource management).

Dissemination: Three workshops to present the results of the research studies: two national workshops, and a regional workshop that will give the opportunity to exchange experiences between project collaborators and the policy analysts in the region. In addition dissemination activities will involve briefings, web page, and monthly reports on the activities of the project. The dissemination activities will target not only the government agencies, but also other stakeholders such farmers, organization, private sector, and donors.

Establishment of a research network: One outcome of the priority setting workshop in July 1999, was the discussion by the participants on establishing a network of policy analysts from the five Central Asian (CA) countries. This network could encourage the sharing of information, and could support CG-CAC Program in disseminating policy research methods, in sharing insights from other countries, and in hosting training courses and workshops. The network will be designed and run by the policy research institutions of CA countries on a rotational basis, starting with Uzbekistan in 2000. It will provide opportunities for collaborative research among the institutions in the region and between them and the international research institutions.

Milestones passed

- Memorandum of understanding with Uzbekistan Ministry of Agriculture
- Review paper on policy challenges facing CAC published
- Regional workshop on "Food, Agriculture and Natural Resource Policy Research - Setting the Priorities"
- Preparation of a set of 12 papers, including 5 country papers, describing the policy issues.

Monitorable milestones: By the end of 2002:

- Publication of three policy studies on food security and agricultural diversification, agro-industry and marketing system development, and sustainable use of natural resources.
- Establishment of a database of indicators based on a combination of field data and secondary data
- Completion of three training courses on food and agricultural research policy
- Completion of two National Workshops based on the policy studies
- Completion of a regional workshop

Gains: The major gains from the projects include, information for designing and implementing policy reforms in the food and agricultural sectors of the CA countries, and enhanced capacity for policy analysis in these countries with a database that will be used for such analysis

Users: The main users of the output are the policy makers in the food and agricultural sectors of the CA countries. The policy analysts in the region will use the database established by the project for further policy analysis.

Duration: 3 years

Cost: \$US 600,000 plus inputs from NARS

Financing: CGIAR start-up funds 1998/99: US\$ 50,000
IFPRI core funds: US\$ 37,500

PROJECT PROFILE

THEME 5:	STRENGTHENING NATIONAL PROGRAMS
SUB-THEME 5.1:	NATIONAL RESEARCH ORGANIZATION AND MANAGEMENT
Status	Planning/Early implementation stage
Focal Point	ISNAR
Collaborating Centers	All participating centers
National Partners	NACAR (Kazakstan); USPCA (Uzbekistan); MSTD-MAWR (Turkmenistan); KAA (Kyrgyzstan); TAAS (Tajikistan); MDSNT-MoA (Azerbaijan); DRE-MoA (Armenia); GAAS (Georgia).

Background

The need to reassess the existing research organization and management structures, and to establish efficient inter-institutional arrangements between research institutions in the region, was recognized at the 1996 Tashkent workshop in which ISNAR participated. ISNAR is experienced in working alongside national programs in developing their research strategies and program plans and will take the lead in this component. Other Centers will be involved in evaluating and recommending improvements in the organization of research institutions that come under their purview.

Project 1: NARS description and assessment of its strengths and weaknesses, comparative assessment of alternative NARS, and assessment of regional cooperation

Activity 1.1 NARS description and assessment of its strength and weaknesses
Objectives To obtain and analyze baseline data and assess needs of the NARS in 8 CAC countries
Outputs Snapshot needs assessments and descriptions for all 8 countries

Activity 1.2 Comparative analysis of organization and management in NARS
Objectives To compare and contrast the NARS in 8 CAC countries
Outputs: Briefing paper on comparative needs and opportunities in CAC countries

Activity 1.3 Assessment of needs/opportunities for regional networks
Objectives To estimate the value of networking systems within CAC
Outputs: A briefing paper on "Needs and Opportunities for regional cooperation and networks in agricultural research and policy setting in CAC"

Project 2: Developing national strategies for NARS reform and opportunities for regional networks

Activity 2.1 Initial support for the process of developing a strategy for reform of NARSs, education and extension in two CAC countries
Output Production of a draft work plan for reform in two CAC countries
Mobilization of technical support for the implementation of the work plan

Activity 2.2 Develop and support opportunities for regional networks
Output System for the coordination of network activities in the development of national strategies

Project 3: Supporting the implementation of national strategies for NARS reform and the development of regional networks

Activity 3.1 Extension of support for the process of developing a strategy for reform of NARS, education and extension to other CAAC countries
Output Completion of reforms in 2 CAC countries
Draft work plans for other countries

Activity 3.2 Support for the process of implementing a strategy for reform of NARS, education and extension in two CAC countries
Output Ensured coordination of the networking for the development of national strategies

Activity 3.3: Support for the development of regional networks
Output System for the coordination of network activities in the development of national strategies

Project 4: Summary analysis and policy recommendations

Activity 4.1 Analysis of the reform process in CAC countries
Output International workshop
Book length report on comparative analysis of NARS reform and needs for future reforms.
Policy paper on "Transformation and Transition in the Caucasus: Needs and opportunities for agricultural policy"

Gains: Management of NARS will understand the possibilities for reorganization of their research systems The data base will provide the necessary information on which to base national research strategies, and donor agencies will have access to up-to-date information on which to base their interventions in this sector. A reestablishment of information flow between the CAC countries and with external research agencies

Users: Mainly NARS Managers

Duration: 2 years

Milestones passed

- Description and needs assessment in Armenia, Azerbaijan, Georgia, and Kazakstan completed
- Expert consultation on Transformation of NARS in CAC completed (Participants CIMMYT, CIP, IBRD, ICARDA, and IFAD)

Monitorable milestones

- Publication of snapshots 2001
- Publication of briefing papers 2001
- Draft Work plans for reform published 2001
- Support mobilized for the implementation of the work plans 2001
- Publication of Book on Transforming NARS 2002
- Production and circulation of the policy paper 2002
- Proposals completed for the refinement of the management and structure of NARS in Tajikistan, Turkmenistan, Azerbaijan and Georgia. 2002

Area or system benefiting: All NARS in CAC but especially those identified as needing assistance in the management and organization of research (Azerbaijan, Georgia, Uzbekistan, Kazakstan and Kyrgyzstan) or in the early stages of reform (Tajikistan, Turkmenistan).

Cost: US\$ 1,137,836

Financing: CGIAR Start-up funding 1998/99: US\$ 100,000

IFAD: US\$ 90,000

Pipeline: US\$ 948,000