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SCIENTIFIC, TECHNICAL AND RESEARCH COMMISSION
COMMISSION SCIENTIFIQUE, TECHNIQUE ET
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SAFGRAD

Semi – Arid Food Grain Research and Development
Recherche et Developpement des Cultures Vivrières dans les Zones Semi-Arides

INTENSIFICATION OF SUSTAINABLE FOOD GRAIN PRODUCTION IN WEST AND CENTRAL AFRICA

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Project Proposal (1997/99)

Submitted to: African Development Bank

3280

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I. INSTITUTIONAL FRAMEWORK

As a Research Coordination Unit of the Scientific, Technical and Research Commission of the OAU, the legislative instruments for establishing and expanding the mandate of SAFGRAD were established through the OAU Council of Ministers Resolution (CM/Res).

CM/Res. 505 (XXIX)
CM/Res. 1264 (LI)
CM/Res. 1417 (LVI)
Lagos Plan of Action.

Under the institutional framework and supervision of the Scientific, Technical and Research Commission of OAU, The Semi-Arid Food Grain Research and Development Agency (SAFGRAD) provides agricultural research and development services about 30 countries in sub-Saharan Africa.

1.1 Goal and Objectives

The overall goal of SAFGRAD has been to assist member countries attain food self-reliance and security in a sustainable manner.

The objectives of the OAU/STRC-SAFGRAD within semi-arid Africa have been to:

⇒ Improve the production and productivity of traditional farming systems with particular emphasis to food grain (i.e. maize, sorghum, millets, cowpea, etc.);

⇒ Foster a dynamic inter-African research cooperation at regional and sub-regional levels;

⇒ Facilitate the dissemination and exchange of improved germplasm and technical information through regional trials, workshop, symposia and monitoring tours;

⇒ Enhance agricultural research and development capabilities of member states through short and long-term training;

⇒ Promote the transfer and adoption of technologies to meet food production challenges in sub-Saharan Africa (SSA);

⇒ Strengthen linkages between research and extension agencies at the national level, and

⇒ Build the resource base for productive agriculture through an integrated farming systems.

1.2 Management

The Science, Technology and Research Commission of OAU is the legal and administrative framework of SAFGRAD. The Technical Advisory and Management Committee (TAMC) is the executive body which provides technical guidance to SAFGRAD. It reviews, appraises and approves programmes of SAFGRAD.

TAMC is comprised of eight (8) NARS eminent scientists research managers representing the five (5) geopolitical regions of Africa and faculties of Agriculture of African Universities. This committee is chaired by the Executive Secretary of OAU and it meets at least once a year.

II. ACTIVITIES AND ACHIEVEMENTS

Over the past two decades, the SAFGRAD programme activities included:

2.1 General

2.1.1 Food grain research and technology development.

2.1.2 Soil-water conservation and management.

2.1.3 Farming systems research and development.

2.1.4 Building indigenous research capacity through collaborative research networks.

2.1.5 Food grain production technology verification activities.

2.1.6 Technology transfer and commercialization of agriculture.

2.1.7 Promote the organization of African professional scientific associations.

2.1.8 Publications on semi-arid agriculture i.e. books, scientific articles and newsletter.

2.2 The Core Programme

The above list of the on-going activities are being carried out in collaboration with NARS of member countries, IARCs, NGOs, private organizations, etc. the core programme of SAFGRAD should be perceived differently than that of IARCs. The thrust of the SAFGRAD programmes, however, encompasses:

2.2.1 Food grains improvement and technology transfer to enhance food security in a sustainable manner.

2.2.2 Farming systems research and development through efficient management of natural resources.

2.2.3 Technology transfer and commercialization of agriculture.

2.3 Achievements (in brief)

2.3.1 Capacity Building

Most African countries inherited agricultural research establishments of the colonial era. As soon as several African countries gained their independence, research services provided by colonialists collapsed. The rebuilding of national agricultural systems become a formidable task. Between 1978 to 1995, OAU/STRC-SAFGRAD in collaboration with IARCs, NARS, Universities, etc. made substantial contribution in developing the research generation and technology transfer capacity of member countries in sub-Saharan Africa (SSA). For example, more than 30 scientists were trained at MSc and Ph.D. levels in various fields of agriculture from Burkina Faso, Cameroon, Chad , Guinea Conakry, Mali, Senegal, Somalia and Togo. About 440 participants from 22 countries have received short-term training inagronomy, plant protection agricultural economics and soil water management.

2.3.2 The Development and Transfer of Food Grain Production Technologies

Elite germplasm, such as varieties, soil-water management practices and related improved agronomic practices were developed and disseminated though SAFGRAD Networks, which all member countries benefited. Several early and extra-early maturing maize, cowpea, sorghum, etc. Cultivars adapted to semi-arid zones, currently are cultivated by several thousand of farmers in various countries.

2.3.3 The Exchange and Diffusion of Technical Knowledge in Semi-Arid Agriculture

Over 500 publications on various aspect of agricultural research and development were distributed to several national research institutions, Universities, regional and international organizations. SAFGRAD has successfully published four technical books on semi-arid agriculture, which ADB has financed with other donors the publication of two books.

2.3.4 Technology Transfer

Perhaps one of the greatest achievements of SAFGRAD has been building capabilities for the transfer of proven agricultural technologies and innovations among member countries and at country level across political, ethnic, linguistic barriers.

2.4 Achievements of ADB Funded Project

High yielding cultivars and improved agronomic practices were disseminated through the "Food Grain Production Technology Verification Project" whose activities were implemented in eight countries through the financial assistance of the African Development Bank. The project has enhanced on-farm verification trials involving farmers and extension development agents through "research-extension-inter phase" activities.

2.4.1 Technology Transfer and Adaptation

Several improved cultivars and agronomic practices have been successfully introduced.

As summarized in Annex 1, over 32 technological options were evaluated in nearly 110 villages. Between 1990/92, the number of farmers who participated in the management of on-farm verification trials did increase from 400 to 1200. During the first three years, the number of farmers with access to demonstration trials, although varied from one country to another, more than 200,000 were exposed to the on-farm verification trials. The 1993/94 verification trials has reached more farmers and disseminated more productive technologies.

Annex 2. Depicts the recommended technical practices generated through the Food Grain Production Technology, Verification Project.

2.4.2 Review and Planning Workshops

Between 1990 and 1994, three agronomic annual planning and review workshops were organized, where researchers from participating countries, regional and international research and development organizations exchanged technical information and experiences related to on-farm research and technology adoption. Furthermore, consultants were fielded (each year) to assess the implementation of project activities in the eight participating countries.

The reviews of country programmes surfaced the following important considerations in the verification of agricultural technologies:

Simplicity of on-farm design: to focus on few cultural practise to effectively demonstrate the technology under consideration is economically feasible and advantageous to farmers.

Appropriateness of technologies: Farmers as main stakeholders have participated. It was concluded, however, there is need to combine technical productivity with socio-economic feasibility to determine the appropriateness of technology.
Farmers have the least access to seeds of improved cultivars, fertiliser and related inputs.

Access of technology to farmers: Farmers involvement in the verification crop production technologies is crucial. Working with group of farmers (i.e. cooperatives) has proved to be an effective means of directly involving many farmers at the same time.

2.4.3 Publication

Please refer to Annex 7. or List of Technical Publications generated through the project.

2.5 ADB Past Financing and Justification

The grant provided by ADB from 1990 to 1994 is depicted in Annex 3.

Taking into consideration, the latest grant 1994, about 55% of the budget was expended for field level research activities in eight countries; 16.25% of the grant was used to enhance exchange of technical information and for a regional workshop on "Technology Options and Transfer systems; 15.97% of the grant was used for training, travel and publication of a book based on the 1995 workshop proceedings. Finally, about 13% of the grant was utilized for the supervision of the project implementation.

2.5.1 Financial Audit

External audit is carried out by OAU General Secretariat. The latest audit was in 1997 for the periods 1994/96.

2.5.2 Budget

The regular budget of OAU/STRC SAFGRAD has been for project activities fom various donors. The proposed budget, for next two years is 5.2 million. The OAU yearly allocation is used for coordination and administration of SAFGRAD activities.

INTENSIFICATION OF SUSTAINABLE FOOD GRAIN PRODUCTION IN WEST AND CENTRAL AFRICA

PROPOSAL FOR ADB SUPPORT 1997/1999

INTENSIFICATION OF SUSTAINABLE FOOD GRAIN PRODUCTION IN WEST AND CENTRAL AFRICA

3.1 Background

The overwhelming majority of Africans live and work in rural areas where they subsist in agriculture as a source of employment and income.

By the year 2025, the population of Sub-Saharan Africa (SSA) is expected to reach about 1.3 billion. There will be nearly 800 million additional people to feed. Research and technology transfer systems in many countries failed to live up to expectations in increasing the level of food production to keep pace with population growth. Furthermore, rapid population growth has put pressure on resource base and land uses in SSA. Thus, Africa faces serious food insecurity problem. Lessons of the project experience in the past four years indicated suitable varieties of maize, sorghum, millet, cowpea, groundnut, etc. alone could not substantially increase production. There is an urgent need to improve the fertility of the soil through the addition of organic matter and legume-based cropping systems and the employment of an appropriate water conservation agronomic practices. Furthermore, the purchase of inputs, such as fertilizer that could sustain soil fertility has become beyond the resources of farmers due to removal of subsides.

The food Grain Production Technology Verification Project funded by ADB (between 90 and 1994) has evolved to address the twin development goals, food security and environmental protection. The thrust of the project is, therefore, "The Intensification of Sustainable Food Grain Production in SSA".

3.2 Goal and Objectives

The primary goal of he project is to attain food security while sustaining the ecological integrity of the agro-ecosystems.

The project will retain, however, its earlier thrust a " research-extension-farmer inter phase" linkages with following main objectives:

i) To promote the participation of all stakeholders including farmers, technology transfer agents, researchers, NGOs, public and private sector in the development of sustainable agricultural production systems.

ii) To enhance the generation of income and employment (in the long-run) for improving the livelihood of millions households in Africa.

iii) To intensify food grain production through the build up of the resource base and delivery of technology options that minimizes and averse risks.

iv) To improve on-farm research skills and farmers practice to consequently enhance the transformation of research results into extension recommendation and production.

3.3 Programmes

3.3.1 Intensification of Agriculture: is the core option of the programme for attaining food security in the 21st century.

The thrust of the technical components of the programme is to strike a balance between sustainable food production and the restoration of the resource base through the efficient management of natural resources.

The technical component module include:

i) The verification of productive and environmentally friendly technologies.

ii) The establishment of forage legumes and Cereal/legume based production systems.

iii) Integration of small ruminants into cropping systems.

iv) Efficient use of soil-water conservation methods.

v) Multiplication of technologies (i.e. improved tools, seeds, etc.)

vi) Capacity building i.e. training, workshop, seminars.

3.3.2 Capacity Building

The emphasis of the training activities is to improve the skills of technicians, farmers, and technology transfer agents.

i) Seminars/workshops/training

Short-term training, seminars and workshops lasting few days to few weeks will be organized in collaboration with national and international research and development organizations. Some of these activities include:

ii) Farmers-extension-research linkage workshop

The workshop will involve farmers, extension agents, NGOs, and researchers from participation countries. The main objective of the workshop are:

- To address on-farm technical and institutional issues affecting technology transfer and adoption;

- To facilitate exchange of experiences among farmers including success stories and failures of agricultural production;

- To establish a dynamic linkage between stakeholders (such as bringing together farmers, researchers, extension agents, NGOs, policy makers to maximize the utilization of on-farm resources and address issues of the performance of adopted food grain production technologies.

iii) Improving scientific and technical communication between and among researchers, extension agents and farmers

The training course will be organized to improve technical skills in communication between and among researchers, extension workers and policy makers. The main objectives of the course are:

- To enhance analysis and technical data interpretation of on-farm research results;

- To improve skills in scientific writing so that of the relevant information would be available to researchers and extension agents;

- To synthesize and document available technological options in order to facilitate the preparation of crops or livestock production guidelines; and

- To eventually prepare technical leaflets for farmers use in participating countries.

Participants include: Researchers and extension agents who have completed University education and worked for some years. The candidate for the course would be largely researchers and extension agents from project participating countries and institutions. The course would be organized in collaboration with NARS, IARCs and Universities.

iv) Annual project review and planning workshop

First, critical review of the on-farm trials results on the performance of technologies, seed production and farmers training activities would be reviewed. Second, the plans for the following season are critically examined for technical feasibility and for potential socio-economic benefits. The participation of those extension agents involved in the project implementation and occasionally some farmers would be attending. Researchers, extension agronomists, annual and external consultants regularly participate in the annual review and planning workshop.

V) Co-sponsoring the intensification of agriculture 2000: International workshop that will be held by May, 1998 in Ouagadougou, Burkina Faso.

The above international workshop will be organized at the eve of the 21st century to address issue for accelerating food production and security, a subject much debated in Africa. Taking the comparative technical advantage of SAFGRAD, semi-arid agriculture in Africa will be the main thrust of the workshop.

Over the last two decades, considerable scientific debate has taken place in order to define the parameters, components and on the required policy environment for the intensification of agriculture. Because of the availability of new generation of technologies, the scarcity of land for an extended fallowing and the apparent population growth, the viable option to feed Africa in 21st century is the intensification of agriculture.

The themes of the workshop will be elaborated through E-mail and Internet dialogue to involving selected experts and potential participants.

3.3.3 Project Sites

The project will be operational in ten countries of West and Central Africa with a population of about one hundred and eighty million (180,000,000). Between 1990 and 1994 , Burkina Faso, Cameroon, Ghana, Nigeria, Senegal and Togo) are among the countries which have benefited from ADB funded "Food grain production technology verification project". The emphasis of this revised project in these countries is to enable farmers repackage available technological options including the integration of small ruminants to improve productivity and income.

The other countries that will participate in the implementation of the project are Benin, Gambia, Guinea Conakry and Mauritania. The choice of these countries is based, first, on the interest demonstrated in these countries; second, on environmental stress, the smallness of NARS, in terms of research and technology transfer capacity; and third on the relative importance of food insecurity problem in each country.

3.4 Justification

The research and development emphasis of this proposal is to improve the livelihood of poor resource farmers that daily wrestle with adverse effects of the semi-arid environment. The twin objectives of the proposal are to attain food security, while sustaining the improvement and conservation of the environment. Furthermore, alternative scenarios have projected that the food insecurity situation in sub-Saharan Africa (SSA) will increase at the rate of 3.5 per cent per year; from 9 million tons in 1990, to almost 30 million tons by the year 2025.

To contain massive hunger and poverty in the 21st century, the level of food grain production must increase by at least two to three folds. At the eve of the 21st century, science based intensification of agricultural production is the way out to meet the food production challenge in SSA.

Among the rationales that the implementation of this project proposal can enable farmers to substantially increase the production of food grain are:

i) Technological options that could double or triple crop yields are available. This project will further verify and repackage these technologies to further improve productivity.

ii) The project model is based on-farm integrated resource management with aim to fully exploit the agronomic, economic and environmental beneficial synergetic effects between programme components.

iii) Technological components of the proposal are chosen based on previous success.

iv) The project will be implemented through participatory approach involving directly farmers to enhance their food security.

3.5 Budget

The budget is based first, on previous experience of project support and the identified needs; second, on complementarities of on-going regional and national programmes; third, to address the resource base sustainability and food security issues; and fourth, to enhance the integration of small ruminants and animal traction for intensifying food production.

Table 1. Summarizes the budget proposal for two years. The 1997/98 proposed budget is comprised of technical components of the project 54.3%; capacity building (training and workshop, etc.) about 26%; travel, publication and for technical assistant, about 6.4%; and for the administrative overhead and supervision of the implementation of the project, about 13%.

The budget for technical component is further elaborated on annex 4 and 5 for 1997/98 and 1998/99 respectively.

Table 1. Budget Summary in US$ Dollars for the Intensification of Sustainable Food Grain Production in West and Central Africa

Activities	1997/1998	1998/1999	TOTAL
1.0 Technical component			
1.1 Verification of technology	89,500	98,800	188,300
1.2 Packaging of technological options for sustained cereal/legume production.	80,600	79,300	159,900
1.3 Integration of small ruminants into cropping systems	107,050	128,500	235,550
1.4 Efficient use of soil-water conservation methods.	79,350	92,400	171,750
1.5 Multiplication of technologies (seeds etc.)	70,800	61,650	132,450
Sub-Total	427,300	460,650	887,950
2.0 Capacity building			
2.1 Training of trainers (Regional)	30,000	30,000	60,000
2.2 Training (National level)	55,000	60,000	115,000
2.3 Research and extension communication	-	15,000	15,000
Sub-total	85,000	105,000	190,000
3.0 Workshops			
3.1 project review and planning	25,000	25,000	50,000
3.2 Farmers/Extension/Research linkage workshops	35,000	-	35,000
3.3 Intensification Agriculture 2000 workshop	40,000	-	40,000
Sub-total	100,000	25,000	125,000
4.0 Equipment and supplies			
4.1 Computers (2)	7,000	-	7,000
4.2 Supplies	10,000	-	10,000
Sub-total	17,000	-	17,000
5.0 Programme Implementation			
5.1 Technical Assistant	20,000	20,000	40,000
5.2 Travel	15,000	20,000	35,000
5.3 Publication	12,000	13,000	25,000
Sub-total	47,000	53,000	100,000
TOTAL	676,300	643,650	1,319,950
Administrative overhead for supervision 13%	87,920	83,675	171,595
GRAND TOTAL	764,220	727,325	1,491,545

Annex 1.

Project Sites, Farmers' Participation and Number of Technological Options Evaluated in the Eight Participating Countries

Country	Project Sites (villages) 1990	1991	Number of farmers managing trials 1992	[2]		Farmers with access to trials	Technological options verified
Burkina Faso		12	197	509	112	32,000	3
Cameroon		15	20	25	25	50,000	4
Ghana		32	70	70	650+	10,000	4
Mali		25	NA	19	25	40,000	2
Niger		2	10	15	NA	2,000	5
Nigeria		9	NA	30	73	20,000	4
Senegal		30	30	50	80	50,000	4
Togo		5	100	150	215	6,000	2
TOTAL		130	427	868	1,180	210,000	28

Source - (Ref. 1, 6 and 10)

NA - Not available

1993/94 data not included

Annex 2. Some of the Improved Food Grain Cultivars and Agronomic Practices Developed and Adapted in Eight Countries through the ADB-funded Project Activities

Country	Remarks on Technology Transfer and Adaptation
Burkina Faso	In Burkina Faso, more than 600 farmers directly involved in conducting the on-farm verification trials. The project emphasized the identification of cowpea cultivars resistant to insects drought and diseases. The new cultivars namely, Kvx-396-44, Kvx 61-1 and Kvx 30-309-66 and improved agronomic practices are adapted to Sahel, Sudan and Northern Guinea Savannah zones. Furthermore, two new cultivars Kvx-404-81 and Kvx 414-2272 that gave more yield by 52 and 47% respectively than local cultivar were also identified in 1994. Minimum level of insecticide spray schedule for the major ecological zones in Burkina was determined. This can reduce not only the cost of production of cowpea, but also contribute to environmental protection.
Cameroon	In Cameroon, improved agronomic packages (improved varieties, fertilizer, plant population etc.) were developed for early maturing maize cultivars namely, DMR-ESRY and Pool-16DR-SR, which were released for the low-land savannah zone in Northern Cameroon. These varieties are appreciated by farmers due to their earliness and for use a "green maize" (within 65 days from planting) during the hunger period, before sorghum and millet harvest. For market gardeners, the sale of green maize has also become a source of income. Considering the removal of subsidies for fertilizer use and the need to build-up the soil organic matter, the on-farm trials focused on exploiting the use of cotton seed cake and reduced level of commercial fertilizer, which gave better yield of maize by more than 500 kg/ha than recommended rate of commercial fertilizer. Furthermore, seed of improved maize cultivars was distributed to more than 2000 farmers.
Ghana	In Northern Ghana, various cropping systems were evaluated. For example, in Bimbilla district, involving ten villages and 35 farmers, the grain yield of maize and groundnut under alley cropping systems (including cereal/pigeon pea) has increased yield by 188 and 54%, respectively than traditional farmers' practices. Cereal/legume rotation trials were conducted in 14 villages in Northern Ghana. Compared to farmers' practice, when maize, sorghum and groundnut were cultivated in rotation, yield increased by 72.31 and 61%, respectively.
Mali	In Mali, the varieties EV-8422-SR (115 days to maturity), DMR-ESR-Y (80-90 days) and TZEF-Y (70 days) were found most promising. A total of 37 farms were involved in the study. In the medium maturity class, the variety EV-8422-SR produced higher yield (4.20 t/ha) and showed good resistance to maize streak virus than the improved checks, Tiémantié (3.66 t/ha) and Tuxpeno (4.10 t/ha). On-farm verification trials yields represented as much as 91%, 88% and 86% of the yields obtained on research station for these varieties, thus narrowing the "yield gap" between on-research station and on-farmers' fields.

Con.t

Country	Remarks on Technology Transfer and Adaptation
Niger	In Niger, the emphasis of the study has been to improve the productivity of the millet/sorghum-based system. Traditionally, farmers, rarely apply commercial fertilizer or organic manure. The trials consisted of mixed planting of traditional and improved sorghum and millet cultivars with and without fertilizer application. The results of these verification trials indicate: Positive yield responses of sorghum and millet to phosphate and nitrogen fertilization. Yield of these crops on farmers' fields (both with local and improved cultivars) either doubled or tripled. Intercropping of millet and sorghum or legume could also improve the productivity per unit area by 50 to 75 per cent.
Nigeria	In Nigeria, the major cropping practices are sorghum/millet/cowpea or maize/cowpea mixtures. The verification trials comprises improved cowpea variety SAMPEA-7, sorghum variety KSV8 and millet variety SE13 in Yandoto area. They gave yields of 2.5, 2.2, 1.3 tons/ha for sorghum, millet and cowpea respectively. These yields were 6-8 times higher than those recorded in Zogsarawa area, leading to yields were 6-8 times higher than those recorded in Zogsarawa areas, leading to greater economic returns in Yandoto. However, the yield advantage of improved varieties over local cultivars was much higher in Zogsarawa region than in Yandoto area. (Sokoto, Katsina, Kaduna, Kano, Igawa, Kebbi and Bauchi States), the 93/94 on-farm trials showed that the cultivation of improved cultivars of sorghum (SAMSORG 14), maize (TZBSR-W), millet (SAMMIL-6) and Cowpea (SAMPEA-7) under improved agronomic practices resulted in higher financial returns. In maize/cowpea cropping systems, the application of 120 kg/ha N, 26 kg/ha P and 50 kg/ha K;, resulted in higher yield of both crops.
Senegal	In Senegal, combined application of organic and mineral fertilizer gave substantial yield of he millet based-cropping systems on farmers' field than on research station. Reduction by 50% the recommended rate of fertilizer and the application of 2 to 5 tons/ha of manure improved millet grain yield on farmers yield by 30, 60, 84 and 40% than traditional agronomic practice in thysse Kaymore, Diofor, Ndiemane and in Northern zone respectively.
Togo	In Togo, the project was sited in the Kara region with a population of 425,000 people. Sorghum, millet, maize, groundnut, cowpea and yam are important staple food crops. Two improved sorghum varieties, Framida and Malisor 84-1, were grown in sole culture or in association with cowpea variety KVx396-4-4 with fertilizer application of 100 kg/ha which was only 12% more than its performance when cultivated in three fold over mixed-cropping. Economic analysis of the mixed cropping systems showed a revenue of 89,131 F CFA/ha, bout 5% less profitable than cowpea sole cultivation. Based on the results of the on-farm verification trials, mixed cropping with sorghum and cowpea varieties mentioned above was recommended to ensure both food security and generation of income at house-hold level.

SAFGRAD COORDINATION
OFFICE
A D B FUNDS

BUDGETARY ALLOCATIONS 1990-1994
ON - FARM VERIFICATION PROJECT ACTIVITIES
FUNDED BY A D B

DESCRIPTION	YEAR I 1990-1991 US $ = 305 F CFA		YEAR II 1991-1992 US $ = 282 F CFA		YEAR III 1992-1993 US $ = 250 F CFA		YEAR IV ** 1993-1994 US $ = 580 F CFA		TOTAL US $	TOTAL F CFA
	A	B	C	D	E	F	G	H	I	J
1.BURKINA	20,328	6,200,000	30,142	8,500,000	30,000	7,500,000	28,448	16,500,000	108,918	38,700,000
2.CAMEROON	6,557	2,000,000	8,865	2,500,000	10,000	2,500,000	12,069	7,000,000	37,491	14,000,000
3.GHANA	5,902	1,800,000	8,865	2,500,000	10,000	2,500,000	15,362	8,910,000	40,129	15,710,000
4.MALI	16,393	5,000,000	17,730	5,000,000	20,000	5,000,000	16,681	9,675,000	70,804	24,675,000
5.NIGER	6,885	2,100,000	6,738	1,900,000				0	13,623	4,000,000
6.NIGERIA	21,639	6,600,000	24,823	7,000,000	26,000	6,500,000	20,378	11,819,000	92,840	31,919,000
7.SENEGAL	19,672	6,000,000	21,277	6,000,000	24,000	6,000,000	19,828	11,500,000	84,777	29,500,000
8.TOGO	2,951	900,000	3,546	1,000,000	4,000	1,000,000	25,863	15,000,000	36,360	17,900,000
9.WORKSHOP	24,590	7,500,000	21,277	6,000,000	29,231	7,307,869	41,107	23,842,060	116,205	44,649,929
10.PUBLICATIONS	1,803	550,000	3,191	900,000	14,723	3,680,750	14,068	8,159,440	33,785	13,290,190
11.CONSULTANCY/EVALUATIO	4,919	1,500,000	7,092	2,000,000	5,138	1,284,576	8,237	4,777,460	25,386	9,562,036
12.TRAVEL	3,279	1,000,000	5,319	1,500,000	3,073	768,254	13,942	8,086,360	25,613	11,354,614
13.COMMUNICATIONS & OTHE							4,165	2,416,804	4,165	2,416,804
14.VEHICLE			21,277	6,000,000					21,277	6,000,000
15.PROJECT MANAGEMENT	15,082	4,600,000	19,858	5,600,000	23,834	5,958,551	32,875	19,067,500	91,649	35,226,051
TOTAL GRANT	150,000	45,750,000	200,000	56,400,000	200,000	50,000,000	253,023	146,753,624	803,023	298,903,624
BALANCE CARRIED FORWARD*	(2,997)	(914,085)	(13,730)	(3,871,860)	(9,006)	(2,251,500)	(3,600)	(2,088,000)	(29,333)	(17,013,613)
TOTAL SPENT	147,003	44,835,915	186,270	52,528,140	190,994	47,748,500	249,423	144,665,340	773,690	281,890,011

* BALANCE CARRIED RESULTS FROM UNSPENT ALLOCATIONS OF ITEMS 9 TO 14
** ALLOCATIONS USED ALSO FOR FIELD ACTIVITIES IN 1995 AND WORKSHOP & OTHERS IN 1996

MAY 1996

Annex 4 **1997/98 Budget Justification (technical component) in US dollars for the intensification of sustainable Food Grain Production in West and Central Africa**

Activities	Benin	Burkina Faso	Cameroon	Gambia	Ghana	Guinea	Mauritania	Nigeria	Senegal	Togo	TOTAL
1) Verification of technology	9,400	9,000	11,000	7,000	7,000	9,000	6,600	10,000	8,500	12,000	89,500
2) Cereal/legume system	7,000	11,000	7,000	8,500	9,000	8,000	8,000	7,100	9,000	6,000	80,600
3) Multiplication of technologies	5,500	6,500	11,800	5,000	9,000	7,000	6,500	8,000	5,000	6,500	70,800
4) Integration of small ruminants	11,000	12,000	10,000	10,000	11,550	NA	8,000	22,000	12,500	10,000	107,050
5) Efficient use of soil-water conservation methods	8,400	10,000	6,000	6,000	9,000	7,400	10,800	7,000	8,000	6,750	79,350
6) Training	5,000	6,000	6,500	5,000	6,000	6,000	5,000	5,000	6,000	4,500	55,000
TOTAL	46.300	54.500	52,300	41,500	51,550	37,400	44,900	59,100	49,000	45,750	482,300

Annex 5 1998/99 Budget Justification (technical component) in US Dollars for the Intensification of Sustainable Food Grain Production in West and Central Africa

Activities	Benin	Burkina Faso	Cameroon	Gambia	Ghana	Guinea	Mauritania	Nigeria	Senegal	Togo	TOTAL
1) Verification of technology	9,500	10,000	12,000	8,800	8,500	11,000	8,000	9,000	10,000	12,000	98,800
2) Cereal/legume system	6,500	8,500	7,500	8,000	7,000	9,500	8,300	8,700	9,300	6,000	79,300
3) Soil water conservation	9,000	12,000	8,500	8,500	8,000	10,000	11,000	9,900	9,000	6,500	92,400
4) Integration of small ruminants	11,000	16,000	12,500	11,000	13,000	NA	14,000	25,000	16,000	10,000	128,500
5) Multiplication of technologies	5,000	6,000	5,900	5,000	7,500	6,500	6,500	7,000	5,500	6,750	61,650
6) Training	5,500	7,500	6,600	6,400	6,000	6,000	6,500	5,000	6,000	4,500	60,000
TOTAL	46.500	60,000	53,000	47,700	50,000	43,000	54,300	64,600	55,800	45,750	520,650

NA = Information not available

Annex 6. Training and Workshops Activities

Activities	Period of Programme Execution	N° of Participants	Budget estimated in thousand US$ dollars			
			ADB	OAU	Other donors	Total
i. Farmers-extension-research networks workshop.	1997/98	30	35	15	25	75
ii. Training in scientific writing and extension communicate.	1998/1999	20	15	20	10	45
iii. Training of trainers in agriculture, rural-economy and extension.	1997/1998	40	60	-	30	90
iv. Regional workshop on intensification agriculture 2000.	1998	75	40	25	70	135
v. Project review and planning workshop	1997/1999	30	50	-	-	50
TOTAL		195	200	60	135	395

Annex 7

List of Publications Generated through the ADB Financed Food Grain Production Technology Verification Project

Publication	Year published	Number distributed
1.0 On-farm verification trials report.	1990/91	70
2.0 Evaluation de l'exécution du projet de vérification des technologies de production de cultures vivrières (Consultant, Dr. M. P. Sedogo).	1991	35
3.0 Third agronomy workshop of the food grain production technology verification project.	May 1991	57
4.0 Report on the Monitoring of the Implementation of the food grain production technology verification project of the semi-arid food grain research and development (Mr. K.A. Marfo, Consultant Report)	1994	30
5.0 Partnership in on-farm verification trials for increased food grain production in West and central Africa (available in French and English)	1994	120
6.0 Technical report of the food grain production verification project	1994	52
BOOKS		
7.0 Progress in Food Grain Research and Production in Semi-Arid of Africa	1994	560 copies was made available to various institutions, researchers, technology, transfer agents, policy maker NGOs, in more than 35 countries in SSA
8.0. Technology Options for sustainable agriculture in semi-arid Africa (The book is based on 1995 Regional Scientific Workshop partially funded by ADB).		Available for distribution by September, 1997

All the above documents were made available to the appropriate offices or departments of ADB.

1997

INTENSIFICATION OF SUSTAINABLE FOOD GRAIN PRODUCTION IN WEST AND CENTRAL AFRICA

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