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REGIONAL STRATEGY TO STRENGTHEN NARS: THE SAFGRAD NETWORKS EXPERIENCES AND APPROACHES

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REGIONAL STRATEGY TO STRENGTHEN NARS: THE SAFGRAD NETWORKS EXPERIENCES AND APPROACHES.

By T. Bezuneh and G. Kingma *

SUMMARY

This paper described the strengthening of national research programmes through the SAFGRAD collaborative networks. The main thrust of the network research and training activities including the structure, function and relationship of network entities were discussed. From its inception, the SAFGRAD networks model comprised of three important partners: i) the member countries of SAFGRAD, as beneficiaries and building units of networks; the two IARCS, IITA which has taken responsibility for the improvement of maize and cowpea; and ICRISAT, for the improvement of sorghum and millet. The SAFGRAD Coordination Office of OAU/STRC, continued to provide political, legal framework research coordination and administration services.

The strengthening of agricultural research of national systems is instrumental to bring about technological changes pre-requisite to sustainable agriculture that could lead to self reliance in food. According to ISNAR data (1986) most NARS in the sub-region have less than 50 researchers and besides a large proportion of them did not have graduate level training for carrying out research.

Long-term financial commitment and policy change are necessary for the development of human resources, research infrastructure, etc. To enhance sustainability of agricultural research, the collaborative mode (networking) was adopted by SAFGRAD (member countries) as major mechanism for strengthening NARS.

Based on identified common constraints to food production and the available research resources of national systems, the collaborative research networks did orient their research programmes both to the needs of technology generation and adapting NARS.

Some of the positive indicators that the networks are making impact on NARS institutions are: i) the emergence of NARS scientific and research management leadership; ii) assumption of regional research responsibility by relatively strong NARS; iii) intensive exchange of technologies through joint evaluation of elite germplasm which has also enabled the relatively weak and small NARS to adapt technologies to their respective conditions.

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Furthermore, short-term training courses provided through networks have yielded positive results since upgrading skills has continued to improve execution of field experiments, data analysis and management. As of 1990, close to 250 participants from SAFGRAD member countries were provided short-term training from few days to six months. Monitoring tours by interdisciplinary teams of NARS and IARCS involved one-hundred scientists since 1987. This activity enabled effective interactions among experienced and young researchers. Workshops covered various aspects of research issues of common interest to member countries. The various workshops involved close to 600 scientists.

Regardless of limited resources at the disposal of NARS, 25 collaborative research projects and 23 regional trials (by respective networks) were further developed. The extensive exchange of germplasm and related improved technologies among NARS, and between IARCS and NARS have contributed to release of suitable varieties (by respective NARS) grown by farmers in different ecological zones.

Within the medium and long-term perspective, SAFGRAD would also promote a number of research programmes to strengthen NARS. These include: the verification and validation of technologies through on-farm research; soil-water conservation based on its previous research achievements; sustainaing fertility of the soil, and addressing agricultural policy issues in collaboration with NARS institutions, and relevant regional and international organizations.

Implicit in the concept of SAFGRAD, is the gradual shift of the coordination and management of networks to NARS. Some progress is being made to attain this goal as the network partners that comprise the SAFGRAD network model and management entities coordinate their efforts in implementing the networks strategic plan.

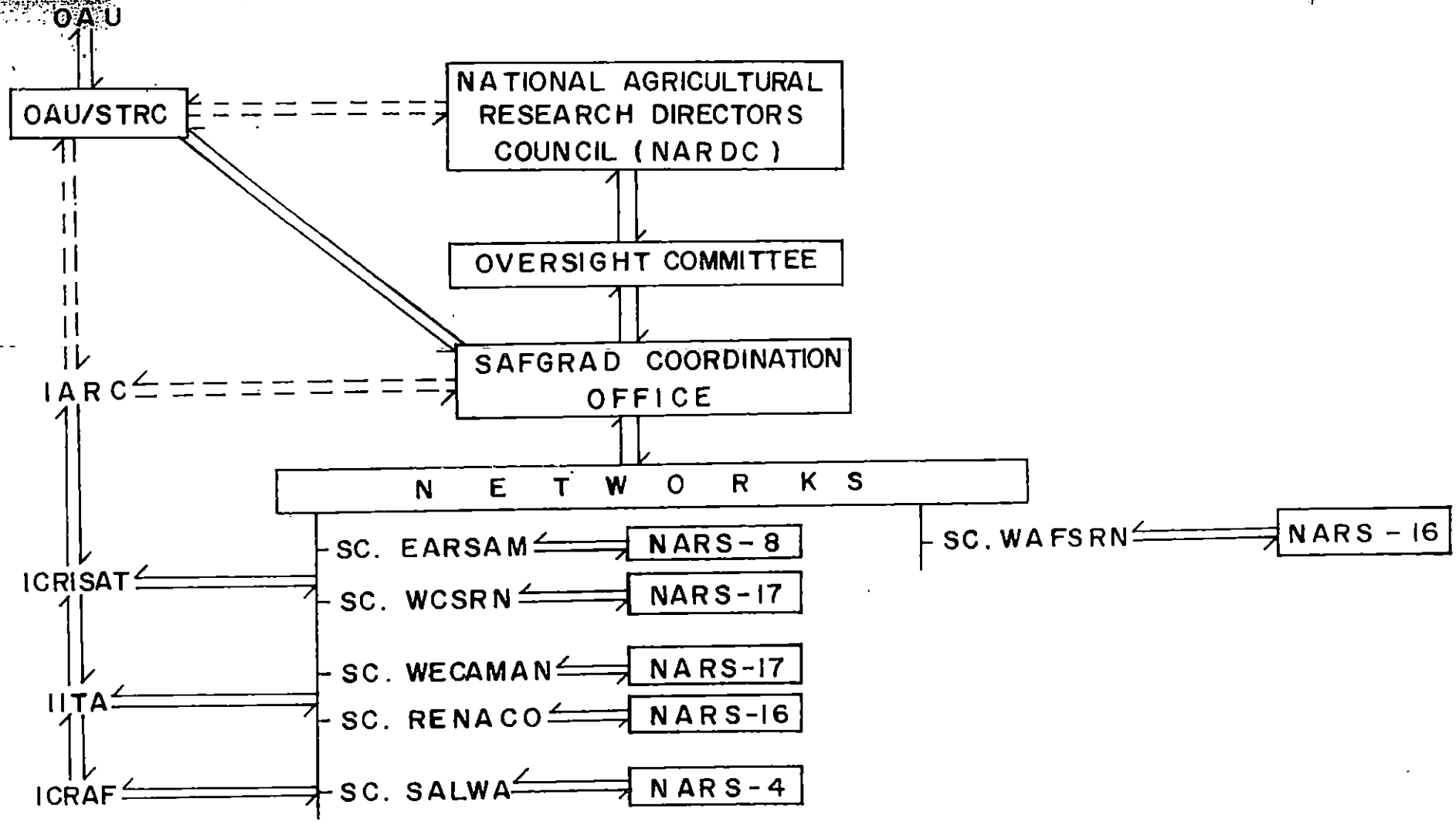


Fig. 2 SAFGRAD ORGANIZATIONAL RELATIONSHIPS

Note: NARS: National Agricultural Systems Numbers indicate partipating Countries in each Network.

OAU: Organization of African Unity

OAU/STRC: Organization of African Unity Scientific, Technical and Research Commission

IARCS: International Agricultural Research Centers

IITA: International Institute of Tropical Agriculture

ICRISAT: International Crop Research Institute for Semi-Arid Tropics

SAFGRAD: Semi-Arid Food Grain Research and Development

WECAMAN: West and Central Africa Maize Network

RENACO: West and Central Africa Cowpea Network

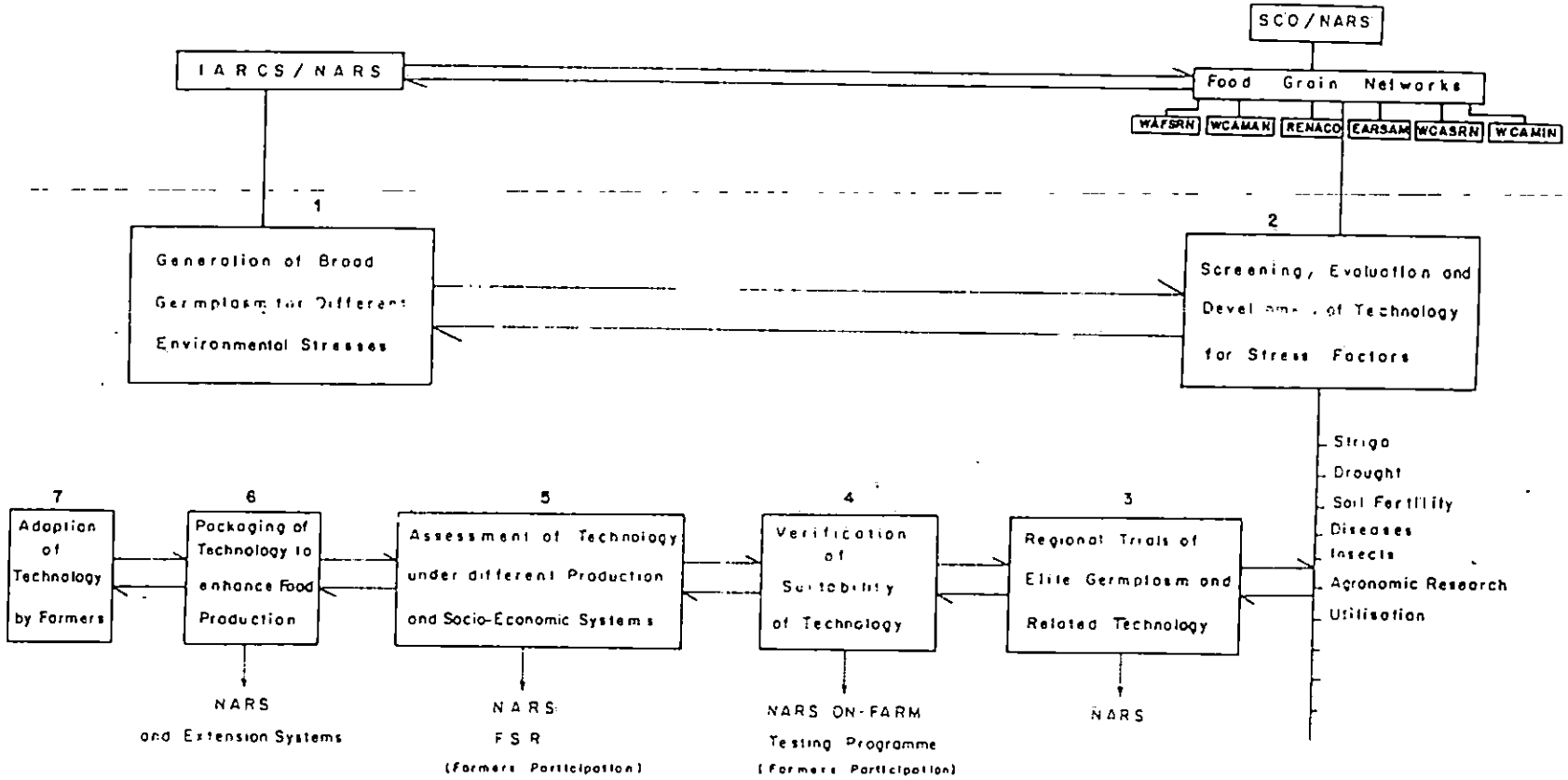
EARSAM: Eastern Africa Regional Sorghum and Millet Improvement Network

WCSRN: West and Central Africa Sorghum Research Network

WAFSRN: West Africa Farming Systems Research Network

SALWA: Semi-Arid Lowland West African Agroforestry Network

Fig 3 . The Network Scheme for the Generation and Evaluation of Technology



SAFGRAD	-	Semi-Arid Food Grain Research and Development	
IARCS	-	International Agricultural Research Centers	
		i.e. International Institute of Tropical Agriculture and International Crops Research Institute for the Semi-Arid Tropics	
SCO	-	SAFGRAD Coordination Office	
NARS	-	National Agricultural Research System	
WCAMAN	-	West and Central Africa Maize Research Network	
RENACO	-	West and Central Africa Cowpea Research Network	
EARSAM	-	Eastern Africa Regional Sorghum and Millet Research Network	
WCASRN	-	West and Central Africa Sorghum Research Network	
WAFSRN	-	West Africa Farming System Research Network	
WCAMIN	-	West and Central African Millet Research Network	

also been identified. Seeds of these sorghum and millet varieties have been widely distributed to NARS for further evaluation.

Research coordinated by WCASRN and its collaborative research has identified sorghum varieties that are high yielding with satisfactory Striga resistance.

WAFSRN is in process of launching collaborative research project activities in three areas namely: the maize based cropping systems cooperative programme; the cassava based cropping systems for forest zone and maintenance and restoration of soil fertility under continuous cropping systems in the Sudanian zone.

The outcome of collaborative research project support at Lead NARS Centres is to develop a nucleus of research excellence (four or more centres for each network) capable of tackling common constraints of food production.

Progress to date indicates the followings:

i) More financial support to improve research infrastructure, and for recurrent costs are necessary. Research grants on competitive basis may need to be provided.

ii) In general, the involvement of IITA and ICRISAT (except for the coordinators provided) in the development of Lead Centres within the networks framework need to be improved.

iii) From networks strategic point of view, Lead NARS Centres are expected to be major sources of germplasm for cooperating technology adapting NARS and for regional trials. The development of such capabilities requires serious commitment of participating countries research

system, the International Agricultural Research Centres, donors and regional organization. This strategy need to be forcefully strengthened during SAFGRAD III.

iv) Lack of qualified researchers within different countries is one of the setbacks for strengthening collaborative research among NARS. Much has been said about the need for long-term training support. On the other hand, training of qualified scientists would take several years. In the mean time, NARS exchange programme of 3 to 12 months duration should be initiated in SAFGRAD III. This could enable networks to fill research gaps particularly in weak national programmes.

REGIONAL TRIALS

This aspect of network activity enabled SAFGRAD member countries to jointly assess the performance of elite germplasm and improved agronomic practices over wide environments across geopolitical boundaries. The role of the networks has been to facilitate such effort among NARS. The IARCs, have continued to provide technologies that were also included in the regional trials for example IITA for the improvement of maize and cowpea, and ICRISAT for sorghum and millet. A total of 22 regional trials were conducted by the four commodity networks of SAFGRAD.

Comments on Regional Trials

i) In general, there is need to improve the conducting of regional trials. The magnitude of the coefficient of variations should be kept as low as 20% unless crop failures prevail due to extreme environmental stress. It is gratifying to note that the quality of data of some networks trials have improved substantially.

ii) Late return of data by some cooperators constrained and delayed combined analysis of the performance of varieties across locations. Researchers should be encouraged and urged to timely send results of regional trials.

iii) The timely distribution of regional trial results is necessary in order to enhance the exchange of research data.

iv) National programmes should consider regional cooperative trials as part of their regular research programme activities since the technologies evaluated would benefit farmers in their respective countries.

v) Regional observation nursery trials should be part of the network activities at Lead NARS Centres in collaboration with IARCS.

EXCHANGE OF TECHNICAL INFORMATION

Facilitating the exchange of technical information is attained through short-term training, seminars, workshops, monitoring tours, and scientist to scientist consultancy visits. As of 1990, close to 250 participants from different SAFGRAD countries were provided short-term training from few days to six months. These training involved scientists and technicians from NARS. The emphasis of training varied from network to network. For example, the West and Central Africa Maize Research Network organized 4-6 month in-service training covering breeding techniques, experimental design and field trial managements data collection, processing and seed production. Feedback indicates that such training skills have made impact in improving the conducting of research experiments. The EARSAM Network had seed production technology workshop, short-term

entomology and pathology courses that benefited close to 80 participants (during SAFGRAD II). On the other hand, WCASRN organized Striga protection training and two agronomic seminars that benefited 26 participants from different countries. RENACO did emphasize special research seminars towards facilitating of exchange of research methodology and improving research skills of cowpea scientists. Its activity involved about 50 participants. The inter-network agronomic seminar for maize, sorghum, millet and cowpea researcher was held in January 1991. It facilitated exchange of technical information and review of agronomic research in participating countries.

Interdisciplinary monitoring tours for 100 scientists were carried out by the respective networks. Each monitoring tour essentially involved a relatively small number of scientists drawn from NARS, IARCS and members of Steering Committee. Monitoring tour enabled joint evaluation of regional trials, review of national research activities at field level, visit of research facilities etc. This aspect of network activities provided effective interactions among experienced and young researchers.

Ten workshops were organized by the five networks as indicated. This covered various aspects of research issues as reported by national programmes of SAFGRAD member countries. These workshops lasted 3 to 7 days and involved close to 600 researchers.

Network Issues Lessons learned

A number of issues may need to be addressed in order to improve the efficiency of networks. Some of items are:

i. Measuring networks success and impacts

Progress can be measured to the degree of fullfilling stated objectives and expected output. Assessment of

research impact entails field survey to determine the extent a technology is accepted by farmers. Positive indicators of network success could be identified.

ii. Resource constraints to strengthen collaborative research

It must be noted that, the strengthening of collaborative research is pre-requisite not only to develop specific centres of research excellence, but also to realize main locations for network coordination.

iii. Limited germplasm sources

Without sustainance of relevant observation nurseries that could continuously enrich the regional trials, the chances of identifying and developing suitable varieties by national systems would be limited. The contribution of germplasm from NARS and IARCs need to improve from current level.

iv. Balance of Network Programme

Network programmes being in confirmance with national systems priorities and objectives, the availability of qualified personnel and resources also reflect their relative strengths and weaknesses. Network activities should not be considered separate to NARS programmes. It could provide alternatives for NARS to "fill research gaps" through balanced programmes. For example, the sorghum, maize and cowpea networks have continued to strengthen agronomic research that had less emphasis at the initial stages of networking. Such effort should be pursued to overcome deficiences in other disciplines of crop research and production.

v. Inter-network communication - between networks (CORAF/ SAFGRAD) and among institutions (IARCS, SAFGRAD, INSAH, etc).

Networking is a mobile activity. It involves extensive travelling to attend seminars, workshops and steering committee meetings to participate in programme reviews of national and IARCs etc.

NARS capacity building efforts need to be coordinated among institutions since they have common objectives i.e strengthening the national systems. Because of the lack of mechanisms to enhance coherence and complementarity among above mentioned institutions, NARS are overburdened and it is affecting their research work since their scientists frequently travel away to attend seminars, workshops, training etc organized (on similar themes) by various institutions.

The inter-network coordination could deal the following problems:

a. Duplication of efforts and overlapping activities; for example, avoiding similar sets of trials. Furthermore, the efforts taken to duplicate networks would be better used to support other essential areas of research.

b. Conducting multidisciplinary research between or among networks could lead to sharing of technology or research equipments, etc.

vi. Concentration on stronger NARS

Because of their relative research strength IARCS and donors agencies to produce research results more quickly, more concentration is given to Lead NARS, enventhrough

smaller and weak NARS have the most to gain from network participation. "Flexibility in orm and extent of participation may help in assisting smaller or less developed NARS to close the gap" as it is being done by some of the SAFGRAD networks. The equal spread of the networks research sites "hot spots" also in weak NARS could provide the opportunity to upgrade skills in conducting trials.

vii. Network research data management

Large volume of research information emanating from the networks activities (collaborative research, training workshops, monitoring tour, etc) need to be compiled in the data base to be utilized by members of respective networks. The WAFSRN effort in this regard could be strengthened to include research data and information of other networks.

viii Sustainability of networks

It is a crucial issue requiring long-term planning financial and research resources commitment by NARS institutions and respective governments and donors. Implicit in the concept of SAFGRAD, is the gradual shift of the management and control of networks to participating NARS.

The sustainability of networks much depends to what extent its programme has been responsive to the research and development needs of its member countries and the extent network activities is entrenched in national research systems. Sustainability of networks raises several concerns and this attainement of this goal within the long-run would depend on NARS leadership development in scientific research and management as well as spirit

of regional cooperation.

ix. Human resource development

This should not be limited to providing more training for researchers but also of structuring incentives (improving research environment, salaries benefits, recognizing scientific contribution etc.).

PUBLICATIONS

The quarterly publication of SAFGRAD Newsletter is maintained. For each issue about five-hundred copies were distributed. Four hundere copies of the book "Food Grain Production in Semi-Arid Africa" was distributed to scientists, research policy makers and agricultural research centres. Large number of SAFGRAD technical and workshop proceedings were widely distributed to member country researchers, national directors and policy makers. Some publication were also distributed to many faculties of agriculture in Africa and elsewhere. WAFSRN bulletins and related publications were also widely distributed.

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Table. 1 Total Sorghum Production Trends in SAFGRAD Member Countries in West and Central Africa.

Country	Area Harvested 1000 ha				Yield kg/ha				Production 1000 MT			
	1979/81	1987	1988	1989	1979/81	1987	1988	1989	1979/81	1987	1988	1989
Benin	90	118	133	139	650	806	733	786	59	95	97	110
Burkina Faso	1051	1176	1295	1362	589	721	779	728	620	848	1009	991
Cameroon	374	250F	253	270F	805	900	909	889	301	225F	230F	240F
Cape Verde	-	-	-	-	-	-	-	-	-	—	—	-
Cntr. Afr. Rep.	57	47*	40*	45F	673	828	1225	1111	39	39*	49*	50F
Chad	414	500	530	500F	570	586	623	578	227	293	330*	289*
Cote d'Ivoire	40	37	38	40F	600	622	632	575	24	23	24	23*
Gambia	6	9	10	14*	795	778	700	1071	5	7	7*	15*
Ghana	223	272	226	284	639	758	786	863	140	206	178	245
Guinea C.	20	24F	24F	24*	1250	1417	1417	1417	25	34F	34F	34*
Guinea Bissau	28	60F	60F	60F	637	617	583	633	18	37	35	38*
Mali	434	491	624F	600F	785	1045	1139	1193	341	513	711*	716*
Mauritania	102	116	164	149F	272	776	665	517	28	90F	109	77*
Niger	822	1100F	1470	1566F	432	333	381	289	347	366	560	452
Nigeria	3050	3182	4247	4200F	1092	1851	1165	1092	3341	5890	4948	4587
Senegal	130	128	130	127*	996	869	846	866	131	111	110*	110*
Sierra Leone	7	8F	8F	8F	1571	2250	2375	2375	11	18F	19F	19F
Togo	122	136	181	200*	715	717	658	811	87	98	119	162

Source: FAO Production yearbook Vol.43 1989

F= FAO Estimate

*= Preliminary data

Table. 2 Total Millet Production Trends in SAFGRAD Member Countries in West and Central Africa.

Country	Area Harvested 1000ha					Yield kg/ha				Production 1000MT			
	1979/81		1987	1988	1989	1979/81	1987	1988	1989	1979/81	1987	1988	1989
	M	S+M	M	M	M	M	M	M	M	M	M	M	M
Benin	13	103	31	35	31 F	504	641	635	677	7	20	23	21*
BurkinaFaso	803	1957	1168	1277	1278	486	541	640	508	390	632	817	649
Cameroon	130	503	100F	110F	110F	753	750	727	909	98	75F	80F	100F
Cape Verde	-	-	-	-	-	-	-	-	-	-	-	-	-
Centr.Afr.Rep	16	73	10*	10*	13F	680	976	971	1154	11	10*	10*	15F
Chad	360	790	450	460	400*	525	500	798	642	182	225	367*	256
Cote d'Ivoire	64	104	68	70	72F	582	603	600	549	37	41	42	41*
Gambia	28	28	44	60*	59*	916	1136	800	949	26	50	48*	56*
Ghana	182	405	235	228	244	648	737	844	738	117	173	192	180
Guinea C.	35	41	40F	40F	40*	1429	1500	1500	1500	50	60F	60F	60*
Guinea Bissau	16	44	30F	30F	30F	600	900	833	833	10	27	25	25F
Mali	643	1077	782	1000F	980F	716	887	965	880	461	694	965*	862
Mauritania	12	117	20	13	15F	290	350	538	533	3	7F	7	8*
Niger	3011	3811	3000F	3526	3385F	435	340	501	382	1311	1020	1766	1293
Nigeria	2836	5929	3705	3874	3400F	857	1187	985	1029	2420	4397	3816	3500
Senegal	932	1062	946	898	977*	587	729	539	687	555	690	484*	671
Sierra Leone	9	9	15F	16F	16F	1343	1333	1375	1375	12	20F	22F	22F
Togo	121	243	128	118	120*	384	552	479	649	44	71	56	78

Source: FAO Production yearbook Vol.43 1989

F= FAO Estimate

*= Preliminary data

- Table. 3 Total Sorghum Production Trends in SAFGRAD Member Countries of Eastern Africa .

ntry	Area Harvested 1000ha				Yield kg/ha				Production 1000MT			
	1979/81	1987	1988	1989	1979/81	1987	1988	1989	1979/81	1987	1988	1989
rundi	53	63F	77*	58*	1000	1000	1465	1514	53	63	113	88
Ethiopia	1048	900*	800*	900F	1372	1056	1205	1071	1419	950F	964*	964 F
nya	168	138	140	146*	984	803	1029	979	160	111	144	143*
anda	159	160F	170*	173 F	1129	1175	1041	948	178	188	177*	164F
Somalia	478	516	570	550F	347	472	412	529	167	244	235	291
udan	3163	3360	5577*	3682*	731	410	793	523	2361	1379	4425*	1924*
nzania	713	758	514	514F	763	875	817	979	543	663	420	503
Uganda	175	185	199*	180F	1788	1550	1452	1444	312	286	289*	260F

Source: FAO Production yearbook Vol.43 1989

F= FAO Estimate

*= Preliminary data

Table. 4 Total Maize Production Trends in SAFGRAD Member Countries in West and Central Africa.

Country	Area Harvested 1000 ha				Yield kg/ha				Production 1000 MT			
	1979/81	1987	1988	1989	1979/81	1987	1988	1989	1979/81	1987	1988	1989
Benin	407	395	486	480	711	677	884	949	289	267	430	455
Burkina Faso	123	176	277	221	880	741	819	1162	108	131	227	257
Cameroon	495	400 F	408*	420*	852	1025	1029	1024	418	410F	420F	430F
Cape Verde	11	29	25F	12F	365	719	639	600	4	21	16	7*
Centr. Afr. Rep.	108	65	69	68F	372	1020	1019	1029	40	66	70	70F
Chad	32	60F	62F	35F	836	567	548	457	27	34*	34*	16*
Cote d'Ivoire	514	621	639	670*	700	700	701	672	352	435	448	450
Gambia	7	13	13 F	11*	1460	1154	1231	1455	10	15	16*	16*
Ghana	390	548	540	567	982	1091	1391	1320	380	598	751	749
Guinea C.	87	90F	90F	94	1000	1000	889	1150	87	90F	80F	108
Guinea Bissau	13	25F	25F	25F	687	800	600	800	9	20	15*	20F
Mali	52	118	114*	125F	1221	1512	1882	1824	61	179	215*	228*
Mauritania	8	2F	11	5F	573	500	636	600	5	1	7	3*
Niger	14	5F	3	5F	708	600	1667	1600	10	3	5	8
Nigeria	443	1137	1556	1500F	1350	1193	1170	1067	599	1357	1821	1600F
Senegal	75	99	112	113*	876	1149	1097	1097	66	114	123	124*
Sierra Leone	13	18*	18*	17F	974	704	711	706	13	12*	13*	12F
Togo	147	225	267	258	1024	765	1109	950	150	172	296	245

Source: FAO Production yearbook Vol.43 1989

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