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INTERNATIONAL ATOMIC ENERGY AGENCY

IAEA-CPS-92/08  
24 June 1992  
Original: ENGLISH

## COUNTRY PROGRAMME SUMMARY

THE AGENCY'S TECHNICAL CO-OPERATION

PROGRAMME WITH

GHANA

1982 - 1992

COUNTRY PROGRAMME SUMMARIES

DEPARTMENT OF TECHNICAL CO-OPERATION

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GHANA

1982 - 1992

COUNTRY PROGRAMME SUMMARIES

EVALUATION SECTION

DEPARTMENT OF TECHNICAL CO-OPERATION

**THE AGENCY'S TECHNICAL CO-OPERATION**

**PROGRAMME WITH**

**GHANA**

**1982 - 1992**

**COUNTRY PROGRAMME SUMMARIES**

This report contains a review of the Agency's technical co-operation activities in Ghana carried out during 1982 - 1992. In terms of coverage and analytical depth, country programme summaries stand somewhere midway between in-depth country programme evaluations and individual project evaluations. They attempt to provide a comprehensive, descriptive picture of the Agency's co-operation with a Member State in a manner that will be particularly useful for programming decisions. The attempt is very much to describe -- largely through statistical data -- not to provide independent analysis and evaluation.

IAEA-CPS-92/08

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**GHANA**

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## INTRODUCTION

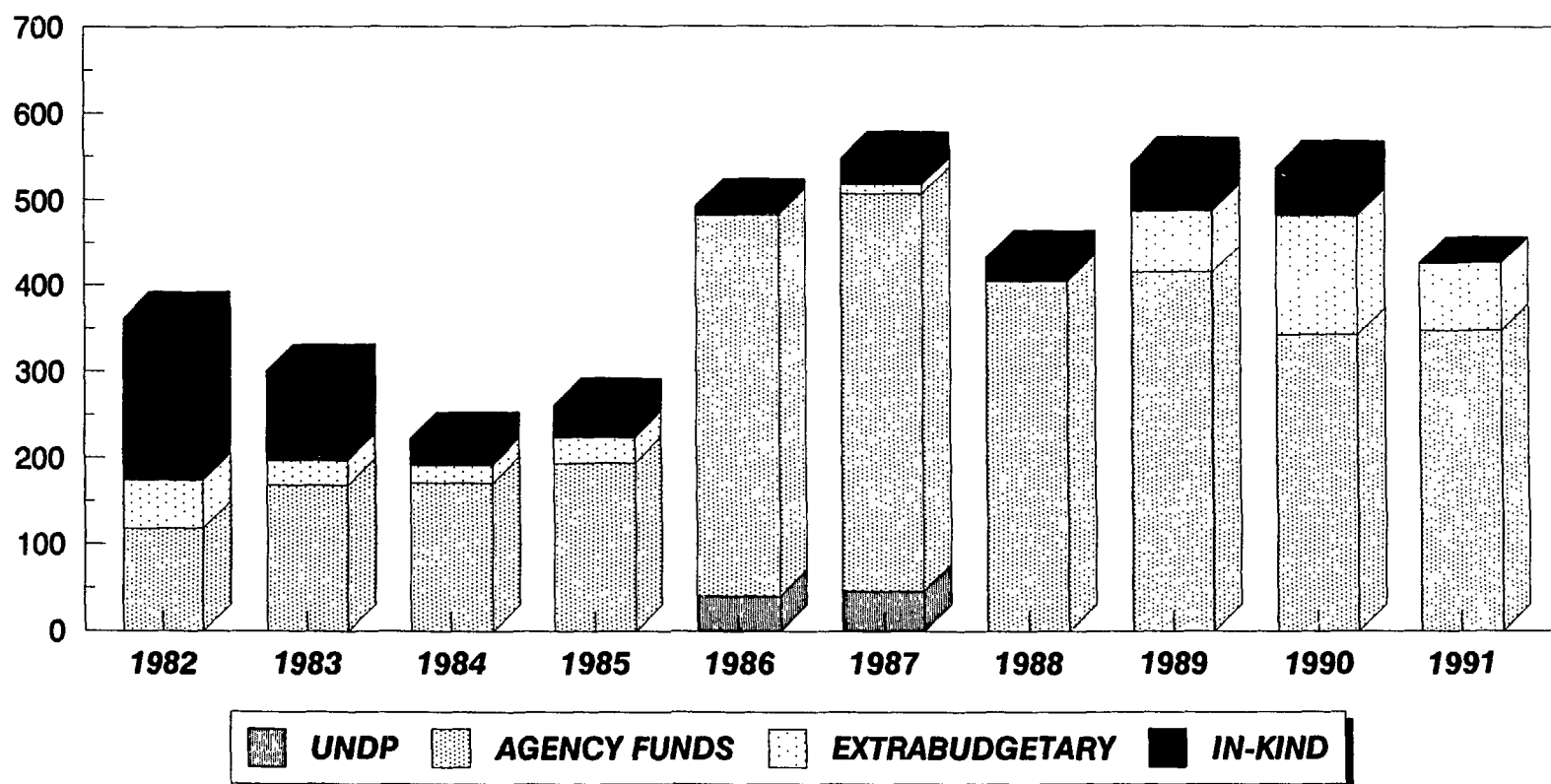
The Country Programme Summary reported on here is one in the series of such studies being undertaken of the Agency's TC programme with Member States. With over \$6.5 million of Agency support received, Ghana ranks 29<sup>th</sup> among all recipients of technical assistance in the period 1958 - 1991.

More than half of the assistance during the past ten years has been provided in the form of equipment (53%), followed by training through fellowships and scientific visits (34%) and expert services (13%). Seventy-four per cent of the resources were provided by the Technical Assistance and Co-operation Fund, 13% through assistance in kind, 11% through extrabudgetary contributions, and 2% by UNDP. It should be noted that the share for extrabudgetary contributions includes an amount of \$250 000 made available by the Ghanaian Government for the purchase of equipment by the Agency under a funds-in-trust arrangement.

With regard to project disbursements by sector, the largest share has gone to agriculture (36%), followed by nuclear physics and chemistry (21%), nuclear medicine (16%), industry and hydrology (14%) and nuclear engineering and technology (9%).

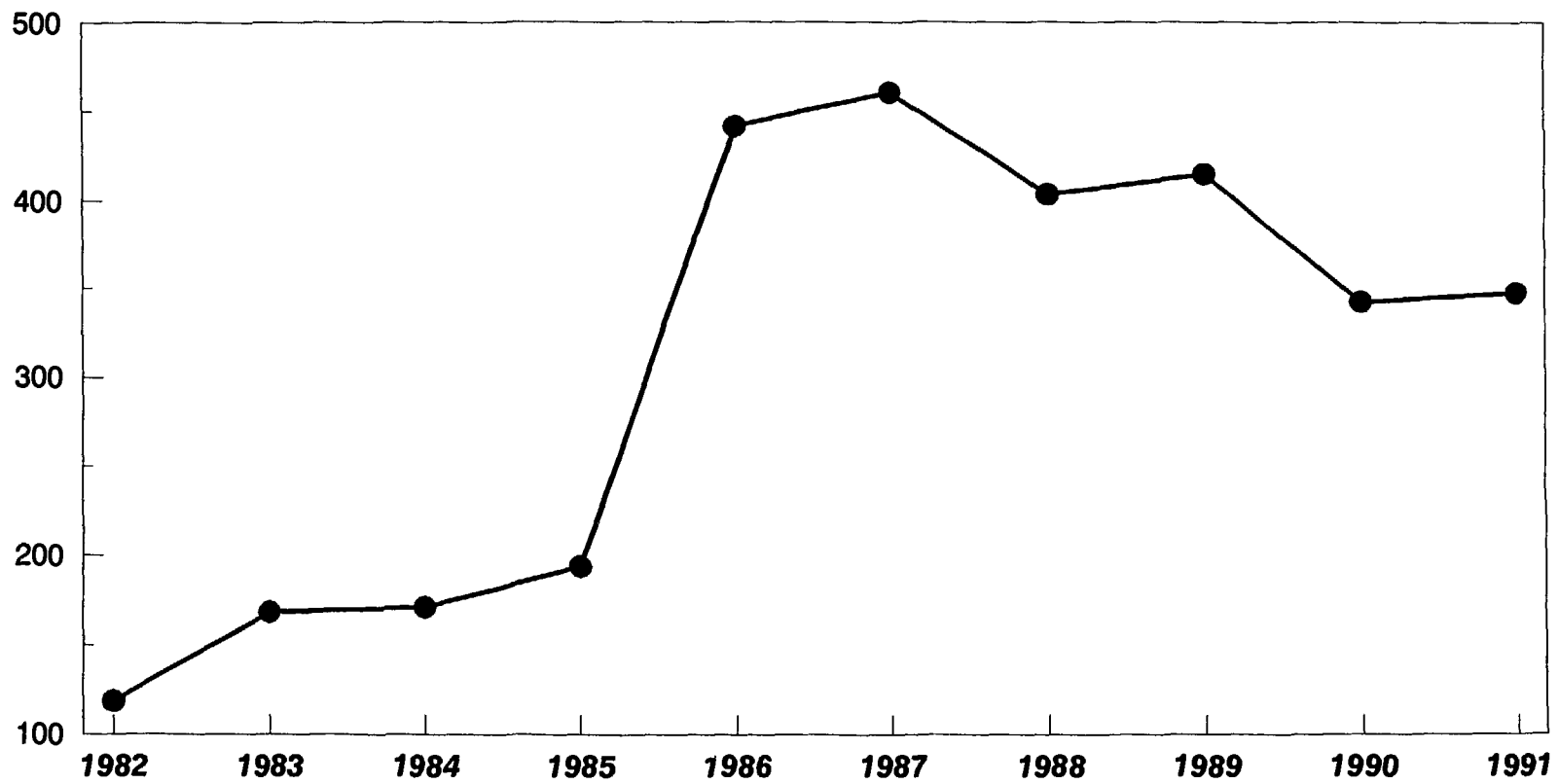
## ASSISTANCE PROVIDED BY THE AGENCY TO GHANA, BY SOURCE, 1982 - 1991

THOUSANDS OF DOLLARS



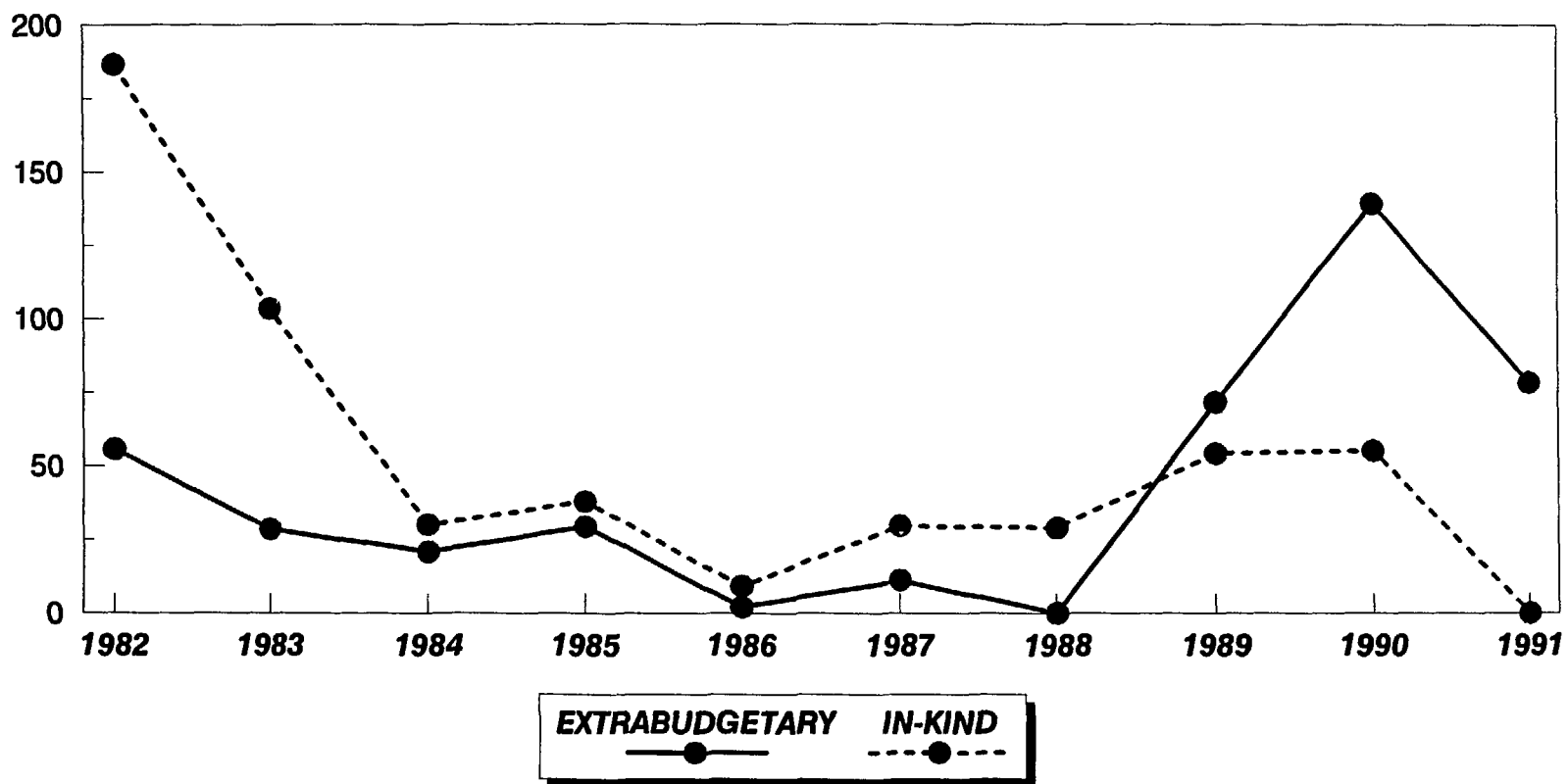
**TACF ASSISTANCE PROVIDED TO  
GHANA, 1982 - 1991**

THOUSANDS OF DOLLARS



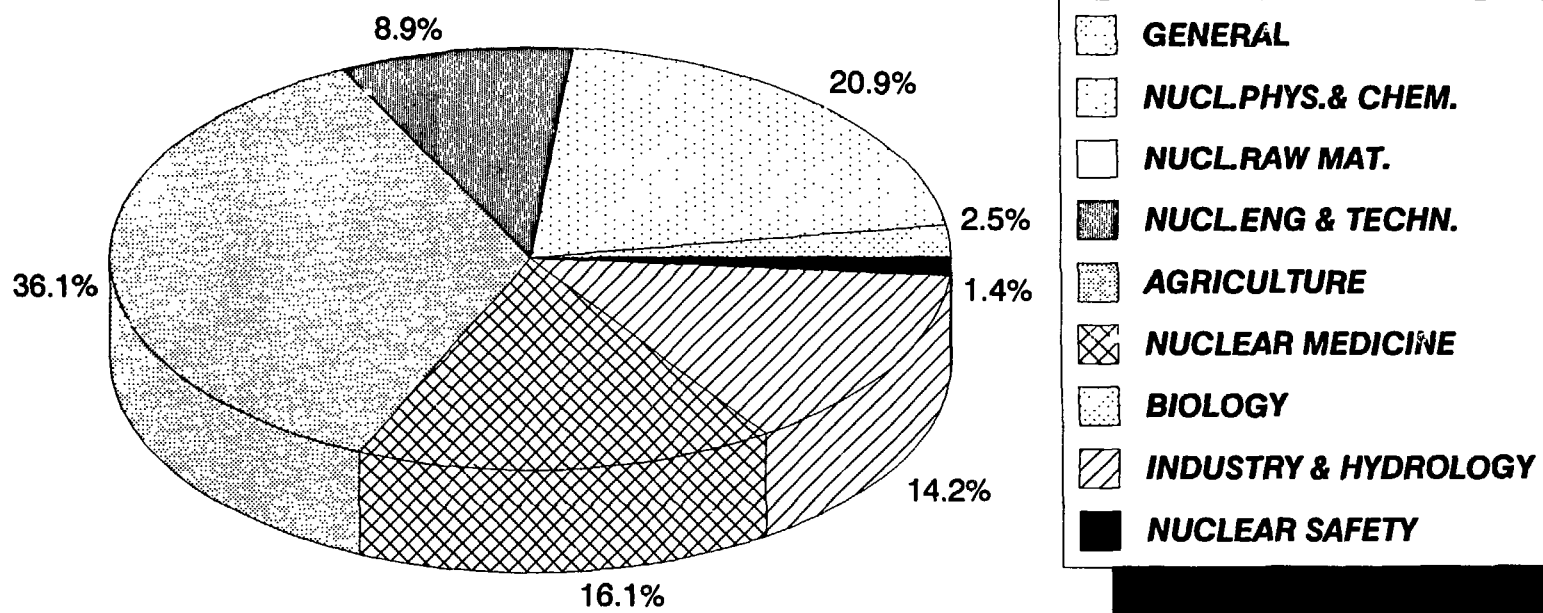
**EXTRABUDGETARY AND IN-KIND ASSISTANCE  
PROVIDED TO GHANA, 1982 - 1991**

THOUSANDS OF DOLLARS



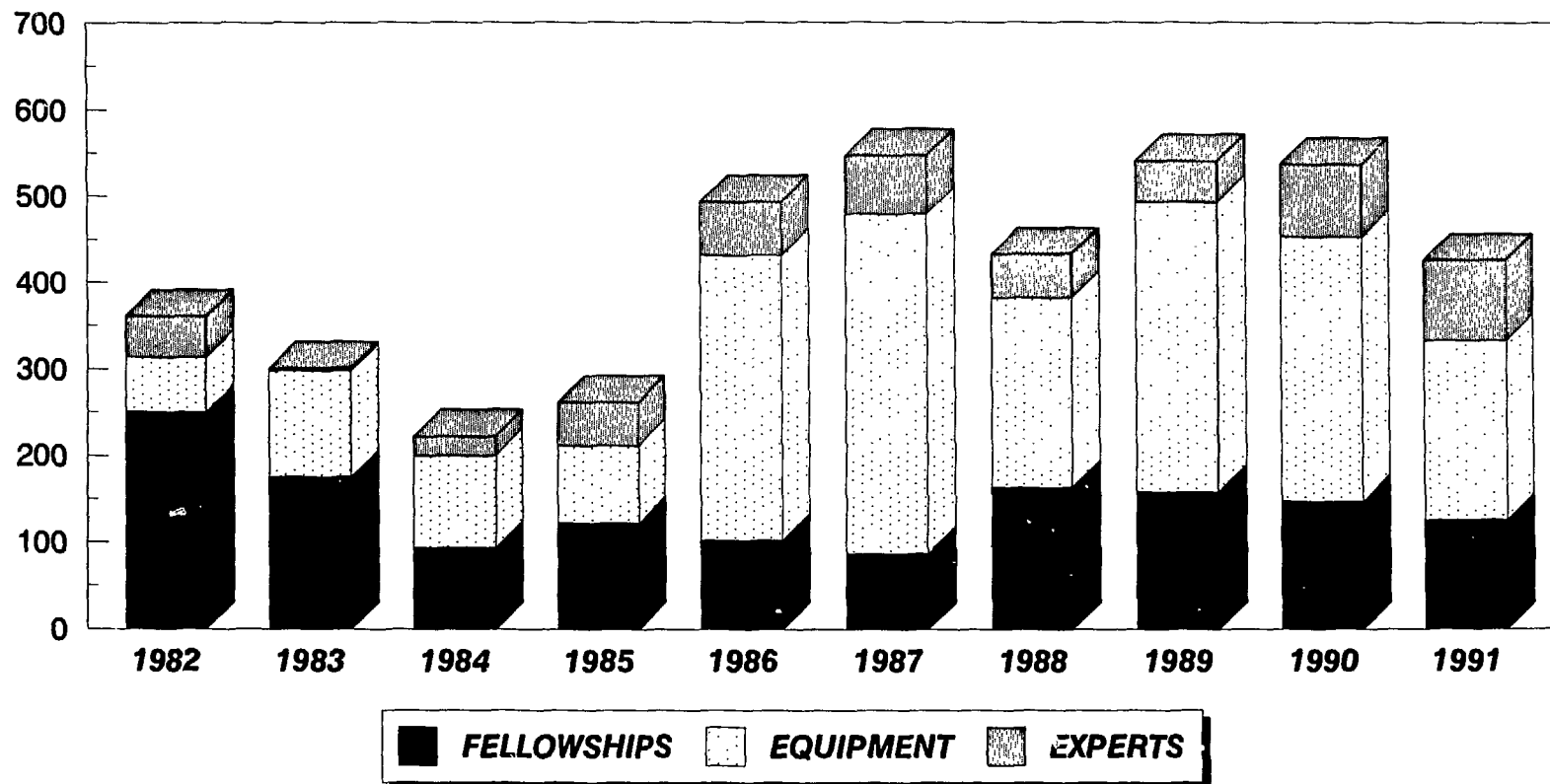


**TC PROJECT DISBURSEMENTS IN GHANA,  
BY SECTOR, 1982 - MAY 1992**

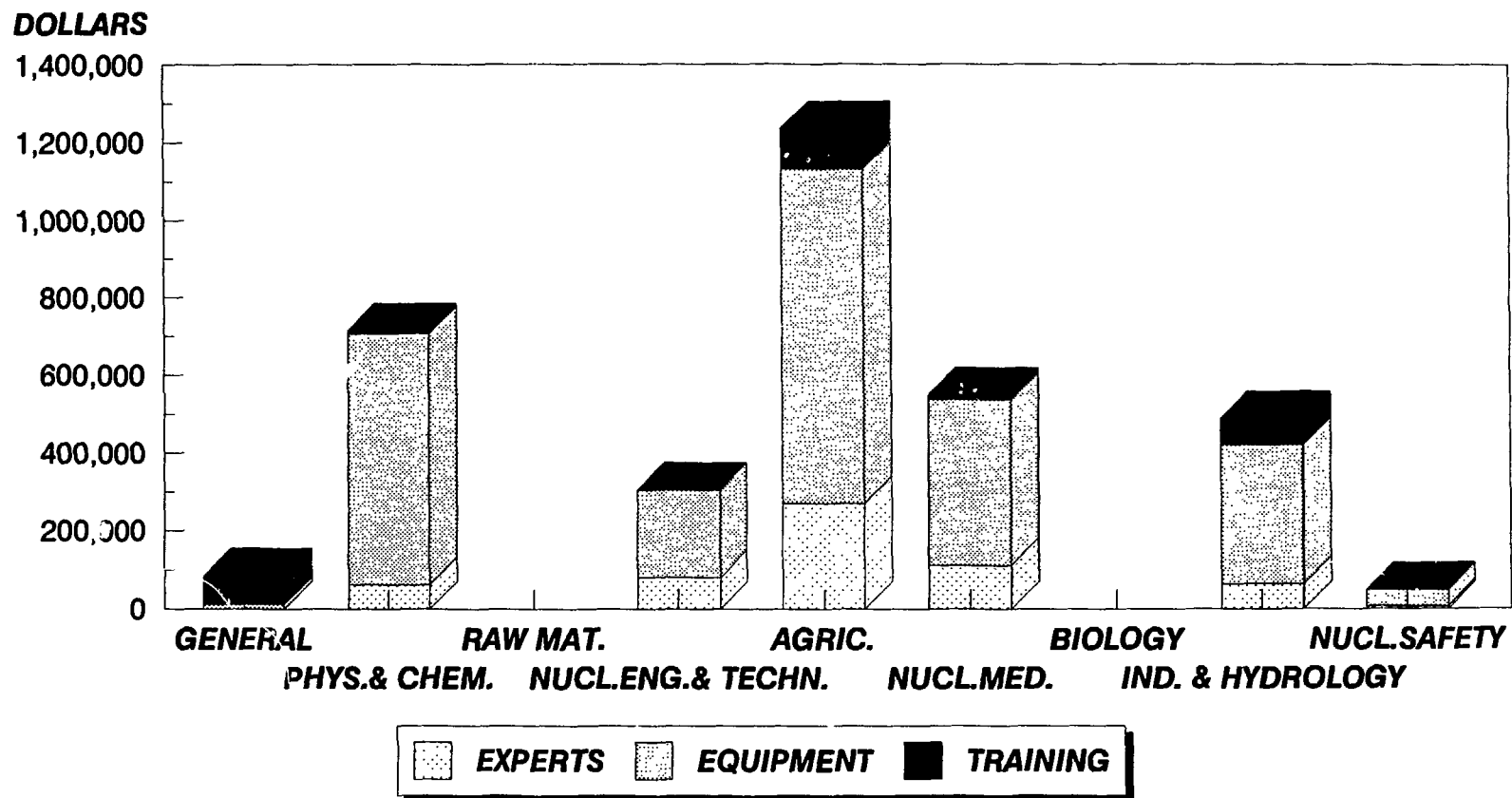


## ASSISTANCE PROVIDED BY THE AGENCY TO GHANA, BY TYPE, 1982 - 1991

THOUSANDS OF DOLLARS



**EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED  
TRAINING PROVIDED TO GHANA, 1982 - MAY 1992**



THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH GHANA

ALL SOURCES

GHANA'S RANKING AS A TC RECIPIENT  
1958 - 1991  
(in \$1000)

YEAR	RANKING	AMOUNT
1958-81	20 <sup>th</sup>	2449.9
1982	23 <sup>rd</sup>	360.6
1983	27 <sup>th</sup>	300.0
1984	37 <sup>th</sup>	221.7
1985	32 <sup>nd</sup>	260.7
1986	25 <sup>th</sup>	492.8
1987	27 <sup>th</sup>	546.9
1988	22 <sup>nd</sup>	432.3
1989	23 <sup>rd</sup>	540.2
1990	25 <sup>th</sup>	536.4
1991	34 <sup>th</sup>	425.4
1958-91	29 <sup>th</sup>	6566.9

**"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE  
1958 - 1991 (in \$1000)**

**ALL SOURCES**

Year	I	II	III	IV	V	GHANA
1958-81	BRA 7907.9	IND 6670.7	ARG 5200.4	PAK 5091.2	CHI 5005.7	20 <sup>th</sup> - 2449.9
1982	EGY 807.5	PER 746.4	CUB 715.7	COL 667.7	THA 654.3	23 <sup>rd</sup> - 360.6
1983	EGY 2077.9	PER 1116.8	VIE 948.1	PHI 778.6	IRA 722.1	27 <sup>th</sup> - 300.0
1984	EGY 3625.9	PER 1750.4	THA 1094.6	CUB 1028.7	PHI 881.2	37 <sup>th</sup> - 221.7
1985	EGY 2494.8	PER 1120.7	THA 1117.4	BGD 1068.2	PHI 963.7	32 <sup>nd</sup> - 260.7
1986	EGY 2317.0	BRA 1452.9	THA 1169.4	POL 1050.3	BGD 896.4	25 <sup>th</sup> - 492.8
1987	HUN 3452.6	EGY 1775.4	THA 1742.4	INS 1312.5	YUG 1223.2	27 <sup>th</sup> - 546.9
1988	EGY 1486.9	BUL 1361.6	CPR 1278.5	THA 1158.7	BRA 1096.7	22 <sup>nd</sup> - 432.3
1989	CPR 1542.3	EGY 1505.1	THA 1205.3	BRA 1096.5	INS 999.1	23 <sup>rd</sup> - 540.2
1990	POL 2308.1	CPR 2005.0	VIE 1589.2	INS 1412.6	BRA 1229.1	25 <sup>th</sup> - 536.4
1991	INS 1305.2	CPR 975.0	EGY 959.8	BRA 951.2	BUL 934.7	34 <sup>th</sup> - 425.4
1958-91	EGY 22222.3	BRA 17021.1	THA 14596.1	PER 12631.1	INS 12383.8	29 <sup>th</sup> - 6566.9

"TOP FIVE" RECIPIENTS OF AGENCY ASSISTANCE  
1958 - 1991 (in \$1000)

TECHNICAL ASSISTANCE AND CO-OPERATION FUND

Year	I	II	III	IV	V	GHANA
1958-81	HUN 2533.0	PAK 2010.9	EGY 1898.7	THA 1712.8	BRA 1704.8	24 <sup>th</sup> - 1034.3
1982	EGY 507.1	HUN 438.2	CUB 430.7	ECU 398.4	ZAM 354.9	39 <sup>th</sup> - 118.5
1983	EGY 1049.4	VIE 897.4	POL 667.8	PAK 498.5	PHI 430.0	34 <sup>th</sup> - 168.1
1984	EGY 1197.2	CUB 655.6	ECU 565.6	BGD 506.3	BUL 472.4	39 <sup>th</sup> - 170.9
1985	BGD 991.8	VIE 745.0	THA 708.7	BRA 571.8	POR 538.7	35 <sup>th</sup> - 193.5
1986	BRA 1381.8	THA 871.9	POL 833.5	BGD 823.9	SYR 751.8	22 <sup>nd</sup> - 441.7
1987	HUN 3305.2	DRK 986.8	BUL 888.5	INS 885.8	EGY 878.9	22 <sup>nd</sup> - 460.6
1988	BUL 1195.6	PER 856.5	EGY 768.6	INS 751.7	MAL 656.0	17 <sup>th</sup> - 403.2
1989	EGY 990.9	CPR 868.2	POR 769.6	CHI 756.9	MAL 619.4	20 <sup>th</sup> - 414.6
1990	POL 1562.3	VIE 1518.8	DRK 1156.2	IRA 958.0	YUG 933.4	33 <sup>rd</sup> - 342.1
1991	BUL 893.1	PAK 868.8	INS 855.1	VIE 817.6	CPR 814.5	34 <sup>th</sup> - 347.2
1958-91	EGY 9591.3	HUN 8256.5	POL 7793.5	BRA 7433.5	PAK 7346.0	27 <sup>th</sup> - 4094.7

ASSISTANCE PROVIDED BY THE AGENCY TO GHANA

Financial Summary 1982 - 1991  
(In thousands of dollars)

Year	ASSISTANCE PROVIDED, BY TYPE						ASSISTANCE PROVIDED, BY SOURCE					
	Experts	Equipment	Fellowships	Group training	Sub-contracts	Total	UNDP	TACF CC	TACF NCC	Extra-budgetary	In-kind	Total
1982	47.7	63.2	249.7	-	-	360.6	-	118.5	-	55.6	186.5	360.6
1983	2.8	122.5	174.7	-	-	300.0	-	133.8	34.3	28.5	103.4	300.0
1984	22.5	105.5	93.7	-	-	221.7	-	169.9	1.0	20.8	30.0	221.7
1985	50.2	88.8	121.7	-	-	260.7	-	184.0	9.5	29.4	37.8	260.7
1986	61.6	329.2	102.0	-	-	492.8	39.8	441.6	0.1	2.1	9.2	492.8
1987	68.0	392.3	86.6	-	-	546.9	45.6	420.4	40.2	11.1	29.6	546.9
1988	51.1	218.7	162.5	-	-	432.3	0.1	400.9	2.3	0.1	28.9	432.3
1989	47.5	335.0	157.7	-	-	540.2	-	316.8	103.8	71.5	54.1	540.2
1990	84.2	306.0	146.2	-	-	536.4	-	320.6	21.5	139.2	55.1	536.4
1991	93.4	206.6	125.4	-	-	425.4	-	341.2	6.0	78.2	-	425.4
1982-91	529.0	2 167.8	1 420.2	-	-	4 117.0	85.5	2 841.7	218.7	436.5	534.6	4 117.0

TECHNICAL CO-OPERATION PROJECTS IN GHANA  
BY SECTOR

PROJECTS COMPLETED AND OPERATIONAL 1982 - 1992

TOTAL PROJECT ALLOTMENTS AND DISBURSEMENTS  
(as of 31 May 1992)

SECTOR	NO. OF PROJECTS	ALLOTMENTS \$	% OF TOTAL	DISBURSEMENTS \$	% OF TOTAL
General atomic energy development	1	84 247	1.6	84 247	2.5
Nuclear physics and chemistry	3	1 880 136	36.3	714 653	20.9
Nuclear raw materials	-	-	-	-	-
Nuclear engineering and technology	2	329 571	6.4	304 848	8.9
Nuclear techniques in agriculture	9	1 444 249	27.9	1 234 177	36.1
Nuclear medicine	4	633 694	12.2	549 269	16.1
Nuclear techniques in biology	-	-	-	-	-
Nuclear techniques in industry and hydrology	3	708 984	13.7	487 247	14.2
Nuclear safety	1	98 725	1.9	47 364	1.3
TOTAL	23	5 179 606	100.0	3 421 805	100.0



TECHNICAL CO-OPERATION PROJECTS IN GHANA  
COMPLETED AND OPERATIONAL, BY SECTOR, 1982 - 1992  
(As of 31 May 1992)

Sector	No. of projects	Total project allotments \$	Total project disbursements \$
<u>Completed projects</u>			
General atomic energy development	1	84 247	84 247
Nuclear physics and chemistry	2	606 636	604 297
Nuclear raw materials	-	-	-
Nuclear engineering and technology	1	37 212	37 212
Nuclear techniques in agriculture	4	626 721	639 169
Nuclear medicine	3	455 244	478 533
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	-	-	-
Nuclear safety	-	-	-
<b>TOTAL</b>	<b>11</b>	<b>1 810 060</b>	<b>1 843 458</b>
<u>Operational projects</u>			
General atomic energy development	-	-	-
Nuclear physics and chemistry	1	1 273 500	110 356
Nuclear raw materials	-	-	-
Nuclear engineering and technology	1	292 359	267 636
Nuclear techniques in agriculture	5	817 528	595 008
Nuclear medicine	1	178 450	70 736
Nuclear techniques in biology	-	-	-
Nuclear techniques in industry & hydrology	3	708 984	487 267
Nuclear safety	1	98 725	47 364
<b>TOTAL</b>	<b>12</b>	<b>3 369 546</b>	<b>1 578 347</b>

EXPERT SERVICES, EQUIPMENT AND PROJECT-FUNDED TRAINING PROVIDED TO GHANA, BY SECTOR  
 PROJECTS COMPLETED AND OPERATIONAL 1982 - 1992  
 (As of 31 May 1992)

FIELD	TOTAL PROJECT ALLOTMENTS				TOTAL PROJECT DISBURSEMENTS			
	EXPERT SERVICES		EQUIPMENT	TRAINING	EXPERT SERVICES		EQUIPMENT	TRAINING
	M/M	\$	\$	\$	M/M	\$	\$	\$
General atomic energy development	-	-	11 649	72 598	-	-	11 649	72 598
Nuclear physics and chemistry	16/15	130 851	1 674 702	74 583	9/15	61 923	645 647	7 083
Nuclear raw materials	-	-	-	-	-	-	-	-
Nuclear engineering and technology	13/26	94 885	234 686	-	13/26	80 250	224 598	-
Nuclear techniques in agriculture	47/10	363 806	951 898	128 545	36/23	268 946	862 030	103 201
Nuclear medicine	18/27	104 399	516 822	12 473	17/15	110 424	426 372	12 473
Nuclear techniques in biology	-	-	-	-	-	-	-	-
Nuclear techniques in industry & hydrology	9/24	78 440	539 444	91 100	5/29	63 464	357 074	66 709
Nuclear safety	1/15	13 725	85 000	-	0/14	5 619	41 745	-
TOTAL	107/27	786 106	4 014 201	379 299	84/02	590 626	2 569 115	262 064

AGENCY FELLOWS FROM GHANA

1982 - 1992<sup>1</sup>  
(As of 31 May 1992)

Sector	No. of fellowships	No. of months/days	Host countries
General atomic energy development	7	22/14	POL, GRE, YUG, AUS, INS, MAL, CPR, USSR, IAEA
Nuclear physics	3	18/03	FRA, USA, UK
Nuclear chemistry	2	13/01	USA, IAEA
Nuclear raw materials	1	6/01	USA
Nuclear engineering and technology	3	11/03	HUN, IAEA
Nuclear techniques in agriculture	55	426/23	AUS, USA, CAN, GER, BEL, NOR, ITA, HUN, NET, NIR, KEN, FRA, BKF, UK, IAEA
Nuclear medicine	9	94/04	USA, IND, UK
Nuclear techniques in biology	3	18/01	DEN, GER, CAN
Nuclear techniques in industry and hydrology	6	45/11	USA, HUN, IND, UK
Nuclear safety	4	19/06	IND, IAEA
TOTAL	93	674/07	

<sup>1</sup>/ Only includes fellows who have completed or at least started training.

GHANA  
FELLOWSHIPS LONGER THAN 12 M/M  
1982 - 1992  
(As of 31 May 1992)

Name	Field of study	Host country	Date	Duration	Project
OPPONG	Solid state physics	FRA	Oct.82 - Jul.84	21/02	-
ABOH	X-ray fluorescence analysis	USA	Aug.90 - Aug.91	12/01	RAF/0/003
ARYEETEY	Radiopharmaceuticals	UK	Sep.81 - Dec.82	15/00	-
ABAIDOO	Soil fertility	USA	Oct.86 - Nov.87	13/02	GHA/5/008
AKUAMOAH	Radioisotopes in animal science	AUS IAEA	Nov.81 - Dec.82	14/00	-
ANKOMAH	Soil fertility	IAEA	Apr.89 - May 90	13/21	RAF/0/003
ASARE	Soil physics	USA	May 88 - Aug.90	27/03	GHA/5/008
ATTAFUAH	Animal reproduction	CAN	Apr.84 - Aug.85	16/02	-
BAIDEN	Soil science	USA	Jun.81 - Jul.83	30/02	GHA/5/008
DOKU	Entomology	UK	Oct.87 - Sep.88	12/00	GHA/5/010
ELEGBA	Soil microbiology	CAN GER IAEA	Feb.83 - Jul.84	16/12	GHA/5/008
HALM	Soil fertility	CAN	May 84 - May 85	12/01	GHA/5/008

GHANA  
FELLOWSHIPS LONGER THAN 12 M/M  
1982 - 1992  
(As of 31 May 1992)

Name	Field of study	Host country	Date	Duration	Project
KWANSA	Animal disease immunology	USA	Nov.81 - Aug.83	21/00	-
MEIER	Radiation entomology	USA	Mar.81 - Jun.83	27/15	GHA/4/005
MENSAH	Plant pathology/breeding	AUS	May 82 - Feb.84	22/00	GHA/5/008
MONTFORD	Radiation entomology	UK	Sep.84 - Sep.85	12/03	-
OKINE	Entomology	USA	Dec.88 - Feb.91	26/03	RAF/0/003
SAFO	Soil fertility	NOR	Sep.85 - Sep.86	12/00	GHA/5/008
STILES	Entomology	UK	Sep.86 - Feb.89	28/16	GHA/5/010
TURKSON	Agricultural biochemistry	IAEA KEN	Nov.86 - May 88	18/00	INT/5/094
YEBOAH	Chemical residues	USA	Oct.81 - Oct.83	24/01	-
AFFRAM	Nuclear medicine	UK	Sep.87 - Sep.88	12/00	GHA/6/007
AHENE	Nuclear medicine	USA	Jul.81 - Jun.83	24/00	GHA/6/004
BAIDOO	Nuclear medicine	USA	Jul.81 - Jun.83	24/00	GHA/6/004
CAESAR	Nuclear medicine technology	USA	Aug.81 - Aug.83	24/00	GHA/6/004

GHANA  
 FELLOWSHIPS LONGER THAN 12 M/M  
 1982 - 1992  
 (As of 31 May 1992)

Name	Field of study	Host country	Date	Duration	Project
DAGADU	Nuclear medicine	USA	Jul.83 - Jul.85	24/02	GHA/6/004
ACHEAMPONG	Isotope hydrology	USA	Jan.89 - Jan.90	12/01	GHA/5/008
KORTATSI	Groundwater hydrology	UK	Sep.81 - May 83	19/22	-
NERQUAYE-TETTEH	Isotopes in hydrology	UK	Sep.83 - Feb.85	16/21	-
SEKPEY	Isotope hydrology	UK	Oct.90 - Oct.91	12/16	GHA/8/006
GJAYE	Dosimetry	IND	Jul.84 - Jul.85	12/01	GHA/1/007

GHANAIAN NATIONALS WHO WERE AWARDED MORE THAN ONE  
FELLOWSHIP OR SCIENTIFIC VISIT  
1982 - 1992  
(As of 31 May 1992)

Name	Field of study	Host country	Date	Duration	Project
ADU-AMPOMAH	1. Plant breeding 2. Plant breeding and genetics	IAEA IAEA NET UK NIR	May 86 - Dec.86 Jun.90 - Jul.90	7/02 1/08	GHA/5/008 GHA/5/016
AHAFIA	1. Nuclear research centre programming  2. Research reactor programming	GRE YUG AUS IAEA USSR INS MAL CPR	Jun.87 - Jul.87  Oct.88	0/26  0/23	GHA/5/008  -
ARYEETAY	1. Radiopharmaceuticals 2. Nuclear medicine	UK IND	Sep.81 - Dec.82 Nov.89 - May 90	15/00 6/00	- RAF/0/003
BAMFORD	1. Analytical nuclear physics 2. Analytical chemistry	POL IAEA	Nov.81 - Aug.82 Started: May 92	9/15 3/00	- RAF/0/007
DOKU	1. Entomology 2. Entomology	UK IAEA	Oct.87 - Sep.88 Sep.91 - Oct.91	12/00 0/19	GHA/5/010 RAF/0/007
ELEGBA	1. Soil microbiology  2. Soil science	CAN GER IAEA IAEA	Feb.83 - Jul.84  Dec.87 - Mar.88	16/12  3/01	GHA/5/008  GHA/5/008

GHANAIAN NATIONALS WHO WERE AWARDED MORE THAN ONE  
FELLOWSHIP OR SCIENTIFIC VISIT  
1982 - 1992  
(As of 31 May 1992)

Name	Field of study	Host country	Date	Duration	Project
KLU	1. Plant breeding	IAEA	Aug.85 - Nov.85	3/14	GHA/5/008
	2. Mutation breeding	NIR UK	Started: Mar.92	6/00	RAF/0/007
OKINE	1. Sterile insect technique	IAEA	Jun.85 - Dec.85	5/27	GHA/5/011
	2. Entomology	USA	Dec.88 - Feb.91	26/03	RAF/0/003
SAFO	1. Soil fertility	NOR	Apr.83 - Jul.83	3/00	GHA/5/008
	2. Soil fertility	NOR	Sep.85 - Sep.86	12/00	GHA/5/008



AGENCY TRAINING COURSES WITH GHANAIAN PARTICIPATION

1982 - 1992  
(As of 31 May 1992)

Field	Number of participants	Number of courses
General atomic energy development	5	5
Nuclear physics	7	7
Nuclear chemistry	4	3
Nuclear raw materials	-	-
Nuclear engineering and technology	14	10
Nuclear techniques in agriculture	31	28
Nuclear medicine	14	12
Nuclear techniques in biology	1	1
Nuclear techniques in industry & hydrology	7	5
Nuclear safety	19	18
TOTAL	102	89

MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES  
BY GHANAIAN NATIONALS  
1982 - 1992  
(As of 31 May 1992)

Name	Course No.	Course title	Year	Location
AFFRAM	INT/6/031 (001) int/9/119 (001) RAF/6/004 (001)	ITC and study tour on nuclear medicine ITC on radiation pathology RTC on radioimmunoassay	1985 1991 1990	USSR FRA ETH
AHAFIA	INT/9/071 (001) RAF/0/005 (001)	ITC on physical protection of nuclear facilities and materials Regional seminar on nuclear science for peace and development	1987 1990	USA UGA
AHMAD	INT/2/004 (001) RAF/2/002 (001)	ITC on the production and quality control of radiopharmaceuticals RTC on radiochemistry and nuclear analytical techniques	1982 1985	GRE KEN
AKAHO	INT/4/092 (001) RAS/0/015 (005)	ITC on the application of small computers to research reactor operations RWS on technology and utilization of low power research reactors	1987 1990	YUG CPR
AMUASI	INT/6/025 (001) RAF/6/006 (001)	ITC and study tour on the application of nuclear methods in medicine RTC on bulk reagent methodology, reagent preparation and quality control for RIA thyroid hormones	1982 1991	USSR TUN
BAMFORD	INT/1/025 (001) INT/8/003 (001)	ITC on the research and application of energy dispersive X-ray fluorescence analysis ITC on applications of nuclear analytical techniques to air pollution	1984 1991	SIN USA
DABIDZO	RAF/4/002 (001) RAF/4/006 (001)	RTC on nuclear electronics RTC on nuclear instrumentation maintenance	1983 1989	ZAM ZAM
DANSO	INT/4/094 (001) INT/8/025 (001)	ITC on research reactor core conversion to low enriched uranium fuels ITC on non-destructive testing, radiography and ultrasonics techniques	1990 1987	AUL KEN

MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES  
BY GHANAIAN NATIONALS  
1982 - 1992  
(As of 31 May 1992)

Name	Course No.	Course title	Year	Location
DARKO	INT/7/011 (001)	ITC on strategies and methodologies for applied marine radioactivity studies	1990	ITA
	INT/9/090 (001)	ITC on the determination of radionuclides in food and environmental samples	1988	MOC
	INT/8/099 (001)	ITC on management of radioactive wastes with regard to radioisotope applications	1989	GER
	RAF/9/006 (001)	RTC on management of spent sealed radiation sources	1991	GER KEN
EMI-REYNOLDS	INT/9/098 (001)	ITC on safety and regulation of unsealed sources of radioactive material	1989	IRE
	RAF/9/005 (004)	RWS on basic radiation and development of national infrastructure for radiation safety	1990	NIR
	RAF/9/005 (007)	RWS on emergency planning, preparedness and international co-operation	1991	AUS
KANKAM	INT/4/098 (001)	Advanced ITC on nuclear electronics	1989	USA
	RAF/4/004 (001)	RTC on protection of nuclear instruments	1991	EGY
KUMAGA	INT/5/098 (001)	ITC on the use of nitrogen-15 in soil science and plant nutrition	1985	GER
	RAF/5/010 (002)	First Research Co-ordination Meeting of the regional project RAF/5/010	1989	TUN
KYERE	INT/6/029 (001)	ITC on nuclear medicine	1984	USSR
	INT/9/077 (001)	ITC for radiation protection officers in regulatory bodies	1987	GDR
OBENG	INT/4/100 (001)	ITC on interfacing in nuclear experiments	1989	THA
	RAF/9/003 (005)	RWS on trouble shooting and maintenance of Harshaw TLC equipment	1991	AUS
OPOKU-PARE	RAF/5/006 (001)	RWS on the establishment and use of monoclonal antibody-based competitive ELISA-system for the sero-monitoring of rinderpest	1991	CMR
	RAF/5/008 (001)	RTC on the use of radio- and enzyme-immunoassay techniques for studies on animal reproduction and disease diagnosis	1986	KEN
	RAF/5/011 (002)	RTC on the diagnosis of rinderpest	1988	ETH

**MULTIPLE PARTICIPATION IN AGENCY TRAINING COURSES**  
**BY GHANAIAN NATIONALS**  
**1982 - 1992**  
**(As of 31 May 1992)**

Name	Course No.	Course title	Year	Location
SCHANDORF	INT/1/014 (002)	Interregional seminar and workshop on calibration procedures in secondary standard dosimetry laboratories	1988	MAL
	INT/1/029 (001)	ITC on dosimetry	1984	BRA
	INT/9/045 (001)	ITC for radiation protection officers in regulatory bodies	1984	GDR
	INT/9/093 (001)	ITC on safety and regulation of sealed sources of radioactive material	1989	USA
	RAF/9/003 (001)	RTC on radiation protection	1987	EGY
	RAF/9/005 (002)	Meeting on regional co-operation in radiation protection in Africa	1989	URT
	RAF/9/005 (004)	RWS on basic radiation and development of national infrastructure for radiation safety	1990	NIR
	RAF/9/005 (008)	Regional meeting on co-operation in radiation protection in Africa	1989	URT
TAKYI	INT/0/039 (001)	IWS on IAEA technical co-operation practices and procedures	1984	SUD
	INT/1/031 (001)	Study tour on the utilization of low energy accelerators	1985	GFR HUN ITA USSR

PROJECTS COMPLETED IN GHANA SINCE 1982  
(As of 31 May 1992)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1974	GHA/0/004	Training in application of nuclear techniques	-	-	11 649	72 598	-	-	11 649	72 598	1982
1980	GHA/1/007	Secondary standards dosimetry laboratory	7/12	49 195	464 905	7 083	7/12	46 267	465 494	7 083	1991
1985	GHA/1/009	Teaching applied to nuclear physics	2/03	15 656	69 797	-	2/03	15 656	69 797	-	1987
1981	GHA/4/007	Applications of nuclear techniques	-	-	37 212	-	-	-	37 212	-	1982
1981	GHA/5/008	Nuclear agriculture centre	11/17	73 865	327 865	35 913	11/17	87 801	328 086	35 655	1990
1982	GHA/5/010	Riverine tsetse fly study	0/28	5 145	55 052	-	0/28	5 145	55 052	-	1987
1987	GHA/5/014	Biological nitrogen fixation in legumes	-	-	74 385	-	-	-	73 087	-	1991
1988	GHA/5/015	Mutation breeding	1/28	14 830	39 666	-	1/28	15 590	38 753	-	1991

PROJECTS COMPLETED IN GHANA SINCE 1982  
(As of 31 May 1992)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS				COMPLETED
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING	
			M/M	\$	\$	\$	M/M	\$	\$	\$	
1974	GHA/6/004	Radioisotopes in medicine	10/00	44 669	77 030	-	10/04	60 628	79 051	-	1983
1978	GHA/6/006	Radioisotopes in medicine	3/00	10 500	51 144	-	3/10	14 894	49 418	-	1982
1982	GHA/6/007	Nuclear medicine	2/27	21 780	237 648	12 473	2/27	23 753	238 316	12 473	1992
	TOTAL	11 projects	39/25	235 640	1 446 353	128 067	40/09	269 734	1 445 915	127 809	

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<sup>1</sup> Figures for equipment include in-kind equipment offered (\$24 000) and delivered (\$24 973) by the USA.

OPERATIONAL PROJECTS IN GHANA  
(As of 31 May 1992)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1991	GHA/1/010	Miniature neutron source reactor	7/00	66 000	1 140 000	67 500	-	-	110 356	-
1982	GHA/4/008	Training in nuclear instrumentation	13/26	94 885	197 474	-	13/26	80 250	187 386	-
1983	GHA/5/011	Eradication of riverine tsetse fly	8/04	52 131	154 003	51 450	8/01	51 876	147 153	51 381
1986	GHA/5/013	Nuclear techniques in ruminant productivity studies	13/23	114 735	131 694	9 682	10/09	69 594	109 353	9 682
1988	GHA/5/016	Genetic improvement of cocoa and coffee	4/00	36 050	68 800	31 500	2/25	31 277	66 815	6 483
1991	GHA/5/017	Eradication of riverine tsetse fly (phase II)	2/00	18 150	70 000	-	-	-	30 846	-
1991	GHA/5/018	Diagnosis and control of diseases in livestock	5/00	48 900	30 433	-	1/05	7 663	12 885	-
1991	GHA/6/008	Nuclear medicine (phase II)	3/00	27 450	151 000	-	1/04	11 149	59 587	-
1979	GHA/8/004	Gamma irradiation facility	4/05	26 840	326 994	38 500	3/22	33 892	207 261	34 071

OPERATIONAL PROJECTS IN GHANA  
(As of 31 May 1992)

STARTED	PROJECT NO.	TITLE	ALLOTMENTS				DISBURSEMENTS			
			EXPERTS		EQUIPMENT	TRAINING	EXPERTS		EQUIPMENT	TRAINING
			M/M	\$	\$	\$	M/M	\$	\$	\$
1988	GHA/8/005	Non-destructive testing (NDT)	3/19	35 250	58 850	-	1/07	11 955	1 270	-
1988	GHA/8/006	Evaluation of groundwater resources	2/00	16 350	153 600	52 600	1/00	17 617	148 543	32 638
1991	GHA/9/004	Radiation protection services	1/15	13 725	85 000	-	0/14	5 619	41 745	-
	TOTAL	12 projects	68/02	550 466	2 567 848	251 232	43/23	320 892	1 123 200	134 255

Footnote-a/ projects not yet upgraded:

GHA/0/005 Establishment of a nuclear science centre  
 GHA/4/009 Nuclear instruments and computer interfacing  
 GHA/5/019 Pesticide residue studies  
 GHA/5/020 Pilot-scale studies in food irradiation  
 GHA/5/021 Soil science



**COUNTERPART INSTITUTIONS IN GHANA (I)**  
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>GENERAL ATOMIC ENERGY DEVELOPMENT</u>		
GHA/0/004	Ghana Atomic Energy Commission, Legon-Accra	-
<u>NUCLEAR PHYSICS</u>		
GHA/1/007	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	SCHANDORF
GHA/1/009	University of Ghana, Department of Physics, Legon-Accra	TETEH
GHA/1/010	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	AHAFIA
<u>NUCLEAR ENGINEERING AND TECHNOLOGY</u>		
GHA/4/007	Ghana Atomic Energy Commission, Legon-Accra	TETEH
GHA/4/008	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	ADDO
<u>AGRICULTURE</u>		
GHA/5/008	1. Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	APPIAH
	2. University of Ghana, Faculty of Agriculture, Soil Science Department, Legon-Accra	DUAH-YENTIMI
GHA/5/10	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	APPIAH

**COUNTERPART INSTITUTIONS IN GHANA (I)**  
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>AGRICULTURE (cont'd)</u>		
GHA/5/011	1. Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	GOMEZ ADABIE
	2. Council for Scientific and Industrial Research, Animal Research Institute, Achimota	DANKWA
	3. Ministry of Agriculture, Animal Health and Production Department, Accra	DOKU
GHA/5/013	1. University of Science and Technology, Department of Animal Science, Kumasi	GYAWU
	2. Ministry of Agriculture, Department of Veterinary Services, Accra	OPOKU-PARE
	3. University of Ghana, Faculty of Agriculture, Department of Animal Science, Legon-Accra	ASSOKU
GHA/5/014	University of Ghana, Faculty of Agriculture, Legon-Accra	KUMAGA
GHA/5/015	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	APPIAH KLU
GHA/5/016	Cocoa Research Institute, Tafo	ADU-AMPOMAH
GHA/5/017	1. Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	GOMEZ ADABIE
	2. Tsetse and Trypanosomiasis Control Unit, Animal Health and Production Department, Pong-Tamale	DOKU
GHA/5/018	1. Ministry of Agriculture, Veterinary Laboratory, Pong-Tamale	AKLAKU
	2. Veterinary Laboratory, Kumasi	APPIAH

**COUNTERPART INSTITUTIONS IN GHANA (I)**  
(By Project)

<u>Project No.</u>	<u>Institute</u>	<u>Counterpart(s)</u>
<u>NUCLEAR MEDICINE</u>		
GHA/6/004	1. University of Ghana Medical School, Korlebu Hospital, Accra 2. Ghana Atomic Energy Commission, National Centre for Radioisotope Applications, Legon-Accra	NKRUMAH -
GHA/6/006	University of Ghana Medical School, Nuclear Medicine Unit, Accra	NKRUMAH
GHA/6/007	University of Ghana Medical School, Nuclear Medicine Unit, Accra	AMUASI AFFRAM
GHA/6/008	1. University of Ghana Medical School, Korlebu Hospital, Accra 2. University of Ghana Medical School, Nuclear Medicine Unit, Accra	AFFRAM AMUASI KYERE
<u>NUCLEAR APPLICATIONS IN INDUSTRY &amp; HYDROLOGY</u>		
GHA/8/004	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	AHAFIA
GHA/8/005	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	DANSO
GHA/8/006	Council for Scientific and Industrial Research, Water Resources Research Institute, Accra	QUIST
<u>NUCLEAR SAFETY</u>		
GHA/9/004	Ghana Atomic Energy Commission, National Nuclear Research Institute, Legon-Accra	SCHANDORF

**COUNTERPART INSTITUTIONS IN GHANA (II)**  
(By Institute)

**ACCRA**

**Ministry of Agriculture  
Animal Health and Production Department  
Accra**

GHA/5/011    Eradication of Riverine Tsetse Fly

**Ministry of Agriculture  
Department of Veterinary Services  
Accra**

GHA/5/013    Nuclear Techniques in Ruminant Productivity Studies

**University of Ghana Medical School  
Nuclear Medicine Unit  
Accra**

GHA/6/006    Radioisotopes in Medicine  
GHA/6/007    Nuclear Medicine  
GHA/6/008    Nuclear Medicine (Phase II)

**University of Ghana Medical School  
Korlebu Hospital  
Accra**

GHA/6/004    Radioisotopes in Medicine  
GHA/6/008    Nuclear Medicine (Phase II)

**Council for Scientific and Industrial Research  
Water Resources Research Institute  
Accra**

GHA/8/006    Evaluation of Groundwater Resources

**LEGON-ACCRA**

**Ghana Atomic Energy Commission  
Legon-Accra**

GHA/0/004    Training in Application of Nuclear Techniques  
GHA/4/007    Application of Nuclear Techniques

**COUNTERPART INSTITUTIONS IN GHANA (II)**  
(By Institute)

**LEGON-ACCRA (cont'd)**

**Ghana Atomic Energy Commission  
National Nuclear Research Institute  
Legon-Accra**

GHA/1/007	Secondary Standards Dosimetry Laboratory
GHA/1/010	Miniature Neutron Source Reactor
GHA/4/008	Training in Nuclear Instrumentation
GHA/5/008	Nuclear Agriculture Centre
GHA/5/010	Riverine Tsetse Fly Study
GHA/5/011	Eradication of Riverine Tsetse Fly
GHA/5/015	Mutation Breeding
GHA/5/017	Eradication of Riverine Tsetse Fly (Phase II)
GHA/6/004	Radioisotopes in Medicine
GHA/8/004	Gamma Irradiation Facility
GHA/8/005	Non-destructive Testing (NDT)
GHA/9/004	Radiation Protection Services

**University of Ghana  
Department of Physics  
Legon-Accra**

GHA/1/009 Teaching Applied Nuclear Physics

**University of Ghana  
Faculty of Agriculture  
Legon-Accra**

GHA/5/014 Biological Nitrogen Fixation in Legumes

**University of Ghana  
Faculty of Agriculture  
Soil Science Department  
Legon-Accra**

GHA/5/008 Nuclear Agriculture Centre

**University of Ghana  
Faculty of Agriculture  
Department of Animal Science  
Legon-Accra**

GHA/5/013 Nuclear Techniques in Ruminant Productivity Studies

**COUNTERPART INSTITUTIONS IN GHANA (II)**  
(By Institute)

**KUMASI**

**University of Science and Technology**  
**Department of Animal Science**  
**Kumasi**

GHA/5/013 Nuclear Techniques in Ruminant Productivity Studies

**Veterinary Laboratory**  
**Kumasi**

GHA/5/018 Diagnosis and Control of Diseases in Livestock

**PONG-TAMALE**

**Ministry of Agriculture**  
**Veterinary Laboratory**  
**Pong-Tamale**

GHA/5/018 Diagnosis and Control of Diseases in Livestock

**Tsetse and Trypanosomiasis Control Unit**  
**Animal Health and Production Department**  
**Pong-Tamale**

GHA/5/017 Eradication of Riverine Tsetse Fly (Phase II)

**ACHIMOTA**

**Council for Scientific and Industrial Research**  
**Animal Research Institute**  
**Achimota**

GHA/5/011 Eradication of Riverine Tsetse Fly

**TAFO**

**Cocoa Research Institute**  
**Tafo**

GHA/5/016 Genetic Improvement of Cocoa and Coffee

**THE AGENCY'S TECHNICAL CO-OPERATION PROGRAMME WITH  
GHANA  
SINCE 1982**

**LONG-TERM EXPERT ASSIGNMENTS**

NONE

**RESEARCH CONTRACTS/AGREEMENTS IN XXX SINCE 1982 <sup>1</sup>**  
**(As of 31 May 1992)**

Field of activity	No. of contracts/ agreements	Amount allocated \$
Nuclear raw materials	1	13 300
Nuclear engineering and technology	4	25 000
Nuclear techniques in agriculture	23	202 255
Nuclear medicine	5	50 500
Safety in nuclear energy	3	20 000
TOTAL	36	311 055

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<sup>1</sup>/ New awards since 1982



**SCIENTISTS FROM GHANA SERVING AS AGENCY  
TECHNICAL CO-OPERATION EXPERTS OR  
TRAINING COURSE LECTURERS  
1982 - 1992  
(As of 31 May 1992)**

Name	No. of assignments	Project(s)
AMUASI	4	RAF/6/006, SIL/6/004, UGA/6/006, URT/6/006
APPIAH	3	RAF/5/015, RAF/5/021
BUTLER	2	SIL/0/004
ELEGBA	6	IRA/5/008, MAG/5/005, MOR/5/013, NIR/5/018, RAF/5/016, RAF/5/020
GARBRAH	2	SIL/0/004
GBEDEMAH	1	RAF/8/016
KUMAGA	1	RAF/5/010
OWUSU-BENNOAH	1	RAF/5/020
WILSON	1	RAF/9/007
TOTAL	21	

**AGENCY FELLOWSHIPS AND SCIENTIFIC VISITS  
HOSTED BY GHANA  
1982 - 1992  
(As of 31 May 1992)**

Recipient country	No. of fellowships	No. of scientific visits	TOTAL <sup>1</sup>
COTE D'IVOIRE	1	-	1
TOTAL	1	-	1

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<sup>1</sup> Includes trainees who have completed or at least started their studies.

**REGIONAL AND INTERREGIONAL TRAINING EVENTS  
HOSTED BY GHANA  
1982 - 1992  
(As of 31 May 1992)**

Course No.	Course Title	Participants	Year
INT/1/021 (001)	ITC on solid state physics	24	1981-1982
RAF/0/006 (001)	RTC on design, management and evaluation techniques of IAEA technical co-operation projects	18	1991
RAF/1/003 (001)	RTC on advanced X-ray fluorescence analysis	11	1987
RAF/2/003 (001)	RTC on application of nuclear analytical techniques in mineral exploration and exploitation	13	1991
RAF/5/010 (001)	RWS on biological nitrogen fixation	11	1987
RAF/5/012 (001)	RTC on the use of isotopes and radiation techniques in studies of biological nitrogen fixation and soil/plant nutrition	20	1988
RAF/5/015 (001)	RTC on induction and use of mutations in plant breeding	16	1990
RAF/5/017 (001)	RTC on tsetse control with the sterile insect technique	14	1990
	TOTAL	127	