

REPUBLIC OF THE GAMBIA

Strengthening Climate Resilience of the National Agricultural Land and Water Management Development Project – Chosso

Final project design report

Main report and appendices

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Currency equivalents

Currency Unit	=	Gambian Dalasi (GMD)
USD 1.0	=	GMD 38.10 (February 2015)
GMD 1.0	=	USD 0.026

Weights and measures

1 kilogramme (kg)	=	2.204 pounds (lb)
1,000 kg	=	1 metric tonne (mt)
1 kilometre (km)	=	0.62 miles
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre (ac)	=	0.405 hectares
1 hectare (ha)	=	2.47 acres

Abbreviations and acronyms

AfDB	African Development Bank
ANR	Agricultural and Natural Resources
AR5	IPCC Assessment Report 5
ASAP	Adaptation for Smallholder Agriculture Programme
AWPB	Annual Work Plan & Budget
<i>bantaba</i>	Local community consultative forum
CCAA	Climate Change Adaptation Assistant
CCAO	Climate Change Adaptation Officer
CEES	Communication, Education and Extension Services of the Department of Agriculture
<i>Chosso</i>	Local name for Strengthening Climate Resilience of the National Agricultural Land and Water Management Development Project, meaning “change”
CO ₂	Carbon Dioxide
COSOP	Country Strategic Opportunities Paper
CPA	Country Programme Approach
CPCU	Central Project Coordination Unit
CPM	Country Programme Manager
CRR-N	Central River Region – North
CRR-S	Central River Region - South
DCD	Department of Community Development
DMS	Department of Meteorological Services
DoA	Department of Agriculture
DRR	Disaster Risk Reduction
DWR	Department of Water Resources
EIRR	Economic Internal Rate of Return
ENRM	Environmental & Natural Resource Management
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental & Social Management Plan
FC	Financial Controller
FFS	Farmer Field School
FIRR	Financial Internal Rate of Return
FLP	Functional Literacy Programme
FM	Financial Management
FMA	Financial Management Assessment
FMAQ	Financial Management Assessment Questionnaire
GAIMS	Gambian Agricultural Information Management System
GANAD	Gambia National Agricultural Database
GCF	Green Climate Fund
GCM	Global Climate Model
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFCS	Global Framework for Climate Services
GNAIP	Gambian National Agricultural Investment Plan
GoTG	Government of The Gambia
GPPA	Gambian Public Procurement Authority
HH	Household
IFAD	International Fund for Agricultural Development
IKMC	Information, Knowledge Management and Communication
IPCC	Intergovernmental Panel on Climate Change
IPSAS	International Public Sector Accounting Standards
IsDB	Islamic Development Bank
<i>Kafo</i>	common purpose group
KMC	Knowledge Management and Communication
KMCO	Knowledge Management/Communications Officer
LADEP	Lowlands Agricultural Development Programme

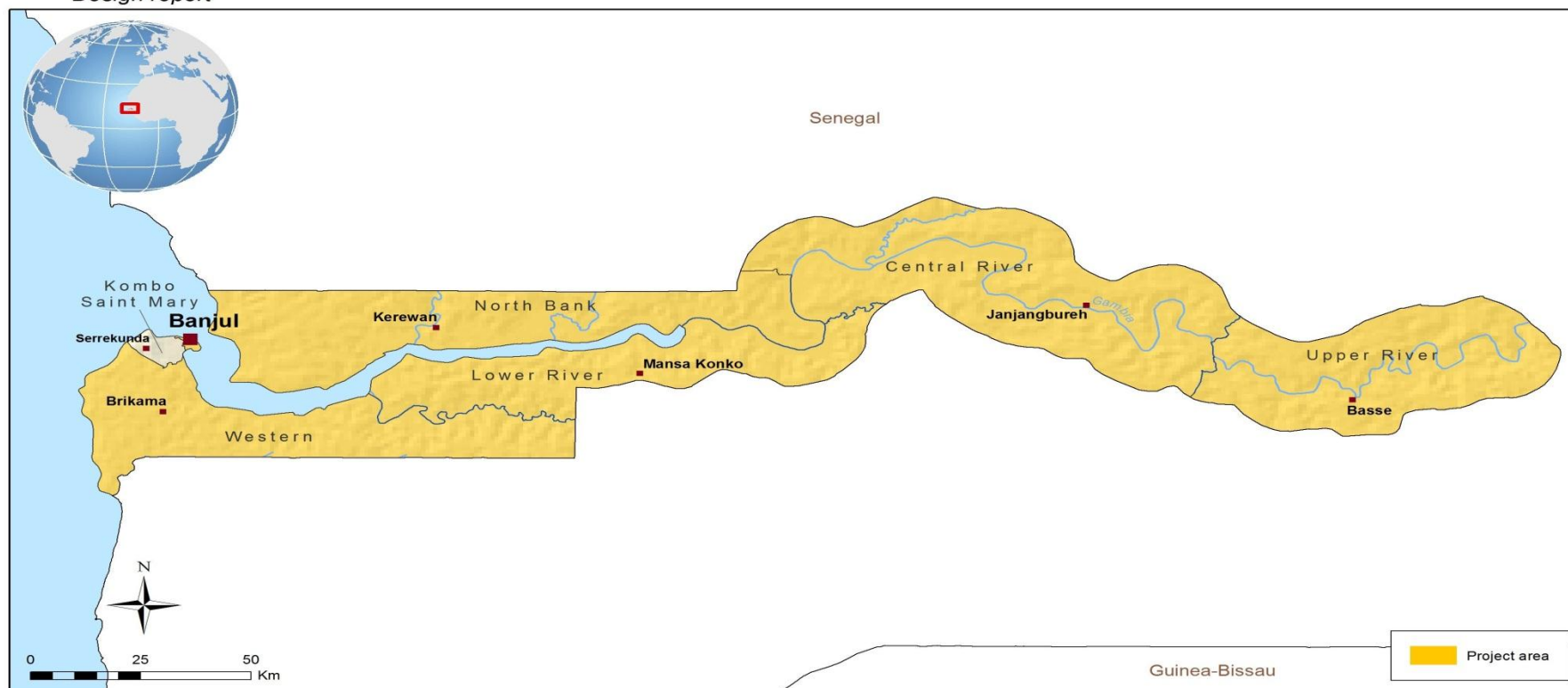
LDCF	Least Developed Countries Fund
LHDP	Livestock & Horticulture Development Project
LRR	Lower River Region
M&E	Monitoring & Evaluation
MDFT	Multi-Disciplinary Facilitation Team
MoA	Ministry of Agriculture
MoECCWPW	Ministry of Environment, Climate Change, Water, Parks & Wildlife
MoFEA	Ministry of Finance & Economic Affairs
MoU	Memorandum of Understanding
MTR	Mid-term Review
NAO	National Audit Office
NAPA	National Adaptation Programme of Action
NARI	National Agricultural Research Institute
NBR	North Bank Region
NCC	National Climate Committee
NDMA	National Disaster Management Agency
NEA	National Environment Agency
<i>Nema</i>	Local name for National Agricultural Land and Water Management Development Project, meaning “prosperity”
NGO	Non-governmental Organization
NPV	Net Present Value
NRDS	National Rice Development Strategy
NRM	Natural Resource Management
O&M	Operation & Maintenance
PAGE	Programme for Accelerated Growth and Employment
PCR	Project Completion Report
PD	Project Director
PEFA	Public Expenditures and Financial Accountability (Assessment)
PIM	Project Implementation Manual
PIWAMP	Participatory Integrated Watershed Management Project
PME	Planning, Monitoring and Evaluation
PMEO	Planning/Monitoring & Evaluation Officer
PO	Producers’ Organization
ppm	parts per million
PRA	participatory rural appraisal
PSC	Project Steering Committee
PSU	Project Support Unit (<i>Nema</i>) or Planning Services Unit (MoA)
PY	project year
RAD	Regional Agricultural Directorate
RIMS	Results & Impact Management System
SCCF	Special Climate Change Fund (established 2001; Global Environment Facility)
SECAP	Social, Environmental and Climate Assessment Procedures
SLMP	Sustainable Land Management Project
SMS	Short Message Service
SoE	Statement of Expenditure
SWMS	Soil and Water Management Service
TA	Technical Assistance
TIS	Tidal Irrigation Scheme
ToR	Terms of Reference
UNCCD	UN Convention to Combat Desertification
UNDP	UN Development Programme
UNEP	UN Environment Programme
UNFCCC	UN Framework Convention on Climate Change
URR	Upper River Region
WCR	West Coast Region
WUG	Water Users’ Group

Map of the project area

Republic of The Gambia

Strengthening Climate Resilience of the National Agricultural Land and Water Management Development Project (Chosso)

Design report



The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.

Map compiled by IFAD | 25-05-2015

Executive Summary¹

Introduction. This Adaptation for Smallholder Agriculture Programme (ASAP) is proposed as additional grant financing for the ongoing IFAD-initiated National Agricultural Land and Water Management Development Project (*Nema*) which has an estimated total cost of USD 65 million, co-financed by IFAD (53%), Islamic Development Bank (23%) and African Development Bank (18%). ASAP financing is fully blended into *Nema*'s framework and aligned to the priorities of the country's National Adaptation Programme of Action (NAPA) as well as to national priority programmes and policies on agriculture and climate change.

Natural resource-based livelihoods and rural poverty. The main agricultural activities on both sides of the River Gambia are rainfed field crops (rice, other cereals, groundnuts) supplemented by very little irrigation, semi-intensive vegetable production and some livestock. Most households also depend on fruit trees, forests and non-forest products as well as fishing (including oyster harvesting in mangrove areas) for their livelihoods. However, the recurrence of increasingly extreme climate events is exacerbating the depletion of the natural resource base and thereby increasing communities' vulnerability to food insecurity, hunger and poverty. In particular, salinity is encroaching on cropland and soil is being washed away from denuded slopes. Women and youth continue to be most vulnerable to climate change impacts given their limited livelihood diversification options.

Project rationale. As the country's rural economy remains highly exposed to external shocks, community vulnerability to climate change remains high given the interrelated natural resource system dynamics coupled with the low adaptive capacity of smallholder farmers. The imperative is to ensure that *Nema*'s investments can work effectively and that target communities are able to protect their livelihoods in increasingly extreme climate conditions. The ASAP financing is intended to optimize the effectiveness of *Nema* interventions in the face of climate-related threats to smallholder agriculture and to ensure the systematic mainstreaming of climate risk management in decision-making and planning processes at all levels. Essentially, the project will finance activities that require either modification or enhancement of *Nema*'s design in order to strengthen the climate resilience of targeted and additional households.

Development objective. Chosso retains the overall goal of *Nema*: *to reduce poverty of rural women and youth*. The development objective is *increased incomes from improved productivity based on sustainable land and water management practices*.

Targeting. The project will continue to target women and youth. *Nema* was designed to benefit women, as the core rice and vegetable producers in the country, and poor young rural men and women engaged in market-oriented vegetable production and agricultural businesses. Community members including vulnerable households will be targeted for climate change adaptation sensitization as well as water harvesting and forest restitution interventions.

Project components and outcomes. Chosso interventions are fully blended into *Nema*'s components and specified as either modifications or enhancements to climate proof the

¹ Design team composition: (from IFAD), Moses Abukari, Country Programme Manager and overall mission leader; Paxina Chileshe, Climate Change Adaptation Specialist; and Mikael Andersson, Finance Officer; and (consultants) Geoffrey Rockcliffe-King, technical team leader and Economist; Jessica Troni, Targeting and Gender/Youth Specialist; Magatte Wade, Irrigation and Rural Infrastructure Engineer; Mamadi Ceesay, Capacity building and Institutional Development Specialist; Suruwa Jaiteh, Agronomist; and Samba Bah, Financial Management Specialist.

original design. Chosso's added project outcomes for smallholders are *reduced vulnerability from climate-induced hazards and increased adaptive capacity in a changing environment*.

Component 1: Watershed development. The intended outcome is the *improved productivity of scarce agricultural lands* through the enhancement of watersheds with complementary water harvesting interventions and community forest restitution (community agroforestry, woodlots and mangrove restoration) and adjustments to the *Nema* tidal, lowland and upland infrastructure designs as well as improved irrigation water efficiency in the village vegetable gardens.

Component 2: Agricultural commercialization. The outcome is *strengthened resilience of both public and private sector partners* in order to provide timely support services and reliable climate risk information to improve the decision-making processes of target households.

Component 3: Project facilitation. *Nema's* Project Support Unit management capacity will be strengthened with additional staff and Technical Assistance provided on request to ensure both effective monitoring and evaluation and the generation and dissemination of best practices to inform climate change adaptation planning, budgeting and management at all levels in the country.

Project area and duration. Chosso will adopt a prioritised geographic coverage based on the climate vulnerability of the communities in which *Nema* will be intervening across all six agricultural regions. A four-year project period is anticipated for Chosso, to be fully aligned with *Nema's* remaining implementation years.

Project cost and financing. Total project costs are estimate at USD 5.7 million.

Chosso costs by components

Component	GMD thousand	USD thousand	% base costs
Watershed development	185,952	3,719	75.1%
Agricultural commercialization	20,950	419	8.5%
Project facilitation	40,710	814	16.4%
Total base costs	247,612	4,952	100%
Physical contingencies	19,609	392	7.9%
Price contingencies	17,600	352	7.1%
Total project costs	284,821	5,696	115%

The project would be funded by IFAD's ASAP grant as an additional financing to the ongoing IFAD-initiated *Nema*.

Chosso financing plan (USD thousand)

	GoTG	IFAD (ASAP)	Benefic. contrib.	Total	% of total
Watershed development	109	3,780	472	4,361	76.6%
Agricultural commercialization	47	405	0	452	7.0%
Project facilitation	68	815	0	883	15.5%
Total costs	224	5,000	472	5,696	100%
Proportion of total cost	3.9%	87.8%	8.3%	100%	

Project benefits and economic justification. Chosso added value rests in the incremental multiple benefits manifested in the recovery of the threatened natural resource base, the

increased resilience of the beneficiaries and their direct empowerment through access to reliable climate adaptation strategies and information for timely decision-making processes. *Chosso* adaptation activities would enhance the resilience capacities of women rice farmers targeted by *Nema*'s tidal irrigation, lowland and upland interventions, and the women and youth operating village vegetable schemes. Many of these and new farmers would benefit directly from communal water harvesting and forest restitution investments in the watershed.

The economic internal rate of return under conservative assumptions for the main four *Chosso* interventions is estimated at 18.1% under the base scenario, combining tangible benefits for rural producers with investments in the remediation and effective management of the communal natural resources upon which they depend.

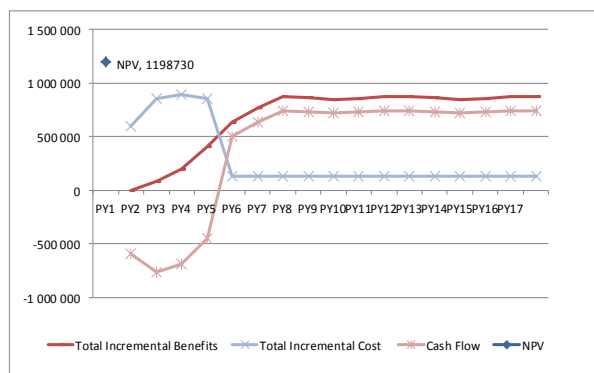
Sensitivity analysis. The economic returns to *Chosso* remain positive under various adverse scenarios: a 20% increase in total costs would reduce the EIRR to 13.8%, a 20% decrease in benefits to 12.9% and a two-year delay in benefits to 12.6%.

Sustainability. The whole approach and scope of *Chosso* is focused on underpinning the future of agriculture in The Gambia through mainstreaming climate change adaptation into the remediation and proper management of the productive natural resource base.

Summary of Chosso Economic and Financial Analysis

Beneficiaries and investment phasing								
	Tidal irrigation farmers	Lowland and upland farmers	Vegetable producers	Water harvesting users	Agroforestry producers	Woodlot producers	Mangrove producers	Climate info users
Unit	no.	no.	no.	no.	no.	no.	no.	no.
PY1	104	200	784	2 700	380	2 000	3 600	2 300
PY2	104	900	956	3 275	540	5 000	4 800	3 300
PY3	0	1 140	924	3 275	540	5 000	4 800	3 300
PY4	0	700	0	2 700	540	3 000	4 800	2 300
Total	208	2 940	2 664	11 950	2 000	15 000	18 000	11 200

Shadow prices and Conversion factors	
Shadow exchange rate	0.85
Discount rate	10%
Water harvesting	0.85
Forest restitution	0.85



Financial Analysis	Community water harvesting				Community forest restitution		
	Water harvesting Net Incremental Benefits (USD)				Forest restitution Net Incremental		
	Trench structure	Earth dam	Run-off structure	Barrage	Mangrove	Agroforestry	Woodlot
PY1	-53 274	-56 234	-34 924	-11 839	-351 780	-62 661	-37 208
PY2	-73 777	-48 246	-29 906	-21 749	-486 629	-92 177	-93 763
PY3	-64 575	-40 257	-24 887	-17 893	-510 081	-96 630	-91 158
PY4	-28 736	-32 269	-19 868	-2 199	-440 176	-89 835	-44 648
PY5	30 673	31 953	20 075	11 568	129 888	10 739	28 830
PY6	30 673	31 953	20 075	11 568	254 364	26 722	46 958
PY7	30 673	31 953	20 075	11 568	378 840	42 704	46 958
PY8	30 673	31 953	20 075	11 568	378 840	42 704	39 338
PY9	30 673	31 953	20 075	11 568	378 840	42 704	27 908
PY10	30 673	31 953	20 075	11 568	378 840	42 704	35 528
PY11	30 673	31 953	20 075	11 568	378 840	42 704	46 958
PY12	30 673	31 953	20 075	11 568	378 840	42 704	46 958
PY13	30 673	31 953	20 075	11 568	378 840	42 704	39 338
PY14	30 673	31 953	20 075	11 568	378 840	42 704	27 908
PY15	30 673	31 953	20 075	11 568	378 840	42 704	35 528
PY16	30 673	31 953	20 075	11 568	378 840	42 704	46 958
PY17	30 673	31 953	20 075	11 568	378 840	42 704	46 958
NPV (USD)	83 934	136 342	87 167	58 984	1 602 556	46 585	126 233
FIRR @3%	7.5%	11.2%	11.4%	13.8%	12.0%	4.7%	8.6%
HHs involved	3 750	4 500	2 500	1 200	2 000	15 000	18 000

SENSITIVITY ANALYSIS			
	Δ%	Link with the risk matrix	NPV @
Base scenario			18.1% 1 198 730
Project bene	-10	Combination of risk factors including access to productive land, managerial capacity of beneficiary communities, and technical capacity of service providers in GoTG service and private sector.	15.6% 768 582
Project bene	-20		12.9% 338 434
Project bene	-30		10.0% -91 714
Project bene	+10		19.0% 1 307 476
Project bene	+20		22.7% 2 059 026
Project costs	+10	Increase in unit costs of construction and materials; inadequate availability of capable service providers.	15.8% 888 455
Project costs	+20		13.8% 578 180
Project costs	+50		9.0% -352 645
1 year lag in ben.		Commitment of beneficiary communities to adaptation; sub-optimal technologies	14.8% 635 548
2 year lag in ben.			12.6% 126 225

Economic	NET INCREMENTAL BENEFITS								NET INCREMENTAL COST				Cash Flow
	Total water harvesting Net Incremental Benefits				Total forest restitution Net Incremental Benefits			Total Incremental Benefits	Water harvesting		Forest restitution		Total Incremental Cost
	Trench structure	Earth Dam	Run-off structure	Barrage	Mangrove	Agroforestry	Woodlot		investment	operating	investment	operating	
PY1	0	0	0	0	0	0	0	0	152 460	0	440 633	0	593 093
PY2	8 857	13 655	8 519	2 732	49 412	0	0	83 174	189 998	5 717	635 223	20 943	851 880
PY3	22 142	27 784	17 317	8 103	115 294	0	6 683	197 323	189 998	12 185	635 223	49 981	887 387
PY4	35 427	41 913	26 115	13 474	243 450	16 799	23 391	400 569	152 460	18 653	598 923	79 020	849 056
PY5	44 284	55 567	34 634	16 206	392 364	40 671	49 064	632 790	0	24 371	0	107 333	131 703
PY6	44 284	55 567	34 634	16 206	475 395	64 542	72 536	763 165	0	24 371	0	107 333	131 703
PY7	44 284	55 567	34 634	16 206	558 427	88 414	72 536	870 068	0	24 371	0	107 333	131 703
PY8	44 284	55 567	34 634	16 206	558 427	88 414	63 571	861 103	0	24 371	0	107 333	131 703
PY9	44 284	55 567	34 634	16 206	558 427	88 414	50 124	847 656	0	24 371	0	107 333	131 703
PY10	44 284	55 567	34 634	16 206	558 427	88 414	59 089	856 621	0	24 371	0	107 333	131 703
PY11	44 284	55 567	34 634	16 206	558 427	88 414	72 536	870 068	0	24 371	0	107 333	131 703
PY12	44 284	55 567	34 634	16 206	558 427	88 414	72 536	870 068	0	24 371	0	107 333	131 703
PY13	44 284	55 567	34 634	16 206	558 427	88 414	63 571	861 103	0	24 371	0	107 333	131 703
PY14	44 284	55 567	34 634	16 206	558 427	88 414	50 124	847 656	0	24 371	0	107 333	131 703
PY15	44 284	55 567	34 634	16 206	558 427	88 414	59 089	856 621	0	24 371	0	107 333	131 703
PY16	44 284	55 567	34 634	16 206	558 427	88 414	72 536	870 068	0	24 371	0	107 333	131 703
PY17	44 284	55 567	34 634	16 206	558 427	88 414	72 536	870 068	0	24 371	0	107 333	131 703

NPV @ 10% USD 1,198,730
EIRR 18.1%

Logical Framework

Results Hierarchy	Indicators ²	Means of Verification	Assumptions
Goal: Reduced poverty of rural women and youth.	<ul style="list-style-type: none"> At least 28,700 HH with 25% increase in asset index (by sex).* <i>Chosso</i> target of 6,600 HH, 90% new). 30% reduction in child malnutrition (by sex).* Reduction in rice “hungry season” from five to two months a year (by sex of head of HH).* 	<ul style="list-style-type: none"> RIMS baseline and impact surveys. GAIMS. National Living Standards Survey. Project Completion Report. 	<ul style="list-style-type: none"> Continued political stability. Commitment to poverty reduction.
Objective: Increased incomes from improved productivity based on sustainable land and water management practices.	<ul style="list-style-type: none"> 4,000 households achieving a 15% increase in income from upland crops. 12,400 women with annual average income from rainfed lowland rice increased from <u>minus</u> USD 62 to USD 163 (by age). 2,000 women with annual average income from irrigated tidal rice increased from USD 119 to USD 826 (by age). At least 4,800 women with annual average income from vegetable production increased from USD 34 to USD 744 (by age). 360 youth with average annual income of USD 7,629 from intensive market-oriented vegetable production (by sex and age). 300 youth with full-time jobs in agricultural service businesses (by sex and age). <p><i>Chosso</i></p> <ul style="list-style-type: none"> 52,450 poor smallholders (5,869 HH) whose climate resilience³ has been increased by at least 15% due to ASAP (by gender) 	<ul style="list-style-type: none"> RIMS baseline and impact surveys. National & Divisional Surveys. GNAIP reports. National Agricultural database. <i>Nema</i> M&E system. Project Completion Report. 	<ul style="list-style-type: none"> Policies favouring smallholder market-oriented agriculture are in place. Sustained emphasis on income-generating opportunities for youth.

² The indicator values are based on PIWAMP and LHDP data, aligned to GNAIP, as validated by the *Nema* baseline survey (* = RIMS indicators). All these indicators will be in the project intervention areas.

³ In this context, a resilient household will be one with access to timely climate information for decision making, water available for productive purposes and practicing at least one climate change adaptation option of which they are aware.

Results Hierarchy	Indicators ²	Means of Verification	Assumptions
Outcomes:			
A: Watershed development			
1 Improved productivity of scarce agricultural lands. 1.1 Enhanced climate resilience of the targeted beneficiaries	<ul style="list-style-type: none"> No of watersheds developed and managed by the communities. Up to 12,400 ha of lowland areas brought under command for improved rice productivity.* Chosso target of 720 ha No of women rice farmers reporting improved yields in lowland from 0.7 t/ha to 1.8 t/ha.* (by age) Up to 2,000 ha of tidal areas developed with water control and drainage structures for rice production. Chosso target of 160 ha. No of women rice farmers reporting annual yield increases in irrigated tidal areas from 1.5 t/ha to 6.5 t/ha (by age). At least 3,100 ha of degraded lowland reclaimed for production. 4,000 ha of upland areas with improved cropping potential. Chosso target of 600 ha. No of women vegetable farmers reporting improved yields, such as tomato from 0.8 t/ha to 9.0 t/ha and onion from 0.7 t/ha to 8.0 t/ha, (by age).* No of youth vegetable farmers reporting average yields of at least 18.0 t/ha for tomato and 16.0 t/ha for onion, (by sex and age).* <p>Chosso</p> <ul style="list-style-type: none"> at least 30% increase in hectares of land managed under climate resilient practices (target of 1,530 ha) No of people with improved access to water for productive purposes. 	<ul style="list-style-type: none"> National & Divisional statistics. GNAIP and GAIMS reports. RIMS reports. Project progress reports. Supervision and MTR reports. 	<ul style="list-style-type: none"> Government committed to lowland rice development based on validation and implementation of the Gambia National Rice Development Strategy. Robust arrangements made for regular maintenance of infrastructure. Availability and affordability of certified seeds, especially rice. Positive supply-side response to improved potential profitability of crops. Appropriate rice and vegetable import tariff regimens to incentivise local producers.
2 Improved farm-to-market access roads.	<ul style="list-style-type: none"> 85% of producers in project area with year-round access to both farmlands and markets. Access roads/tracks serving 2,500 ha of farmland constructed or upgraded. At least 16,550 workers employed temporarily under labour-based construction of infrastructure within watersheds. 	<ul style="list-style-type: none"> National & Divisional statistics. GNAIP reports. RIMS reports. Project progress reports. Supervision and MTR reports. 	<ul style="list-style-type: none"> Robust arrangements made for regular maintenance of infrastructure.

Results Hierarchy	Indicators ²	Means of Verification	Assumptions
B: Agricultural commercialization			
1 Strengthened producer capacity.	<ul style="list-style-type: none"> At least 20,000 producers adopting and practicing ecologically sound approaches.* At least 72 producer organizations enabled with technical and business skills. <p><i>Chosso</i></p> <ul style="list-style-type: none"> No of community groups including women's group involved in ENRM and/or Disaster Risk Reduction formed or strengthened. 	<ul style="list-style-type: none"> National & Divisional statistics. GNAIP reports. RIMS reports. Project progress reports. Supervision and MTR reports. 	<ul style="list-style-type: none"> Conducive legal and regulatory environment supporting POs at all levels.
2 Agricultural enterprise promotion.	<ul style="list-style-type: none"> 36 youth trained and starting businesses (by sex and age). 300 women-<i>kafos</i> supported with market-oriented enterprises (by age). 60 start-up agricultural service enterprises capitalized and operational, creating 300 jobs. 	<ul style="list-style-type: none"> National & Divisional statistics. GNAIP reports. RIMS reports. Project progress reports. Supervision and MTR reports. 	<ul style="list-style-type: none"> Availability of competent agencies to drive agricultural commercialisation.
3 Technical support services.	<ul style="list-style-type: none"> At least 20 service-providers with strengthened capacity in agricultural business promotion. At least 50% of women and youth <i>kafos</i> express satisfaction with the quality of services provided. 	<ul style="list-style-type: none"> National & Divisional statistics. GNAIP reports. RIMS reports. Project progress reports. Supervision and MTR reports. 	<ul style="list-style-type: none"> Adequate private sector capacity and interest in agricultural business promotion.
C: Project facilitation			
1 Effective and operational national M&E mechanisms in place to support proactive sectoral development.	<ul style="list-style-type: none"> Delivery and use of M&E at national and regional levels. National M&E system fully operational by PY2. 	<ul style="list-style-type: none"> GANAD reports. Project progress reports. Supervision and MTR reports. 	<ul style="list-style-type: none"> Completion of structural reform of MoA management arrangements.

Results Hierarchy	Indicators ²	Means of Verification	Assumptions
2 Knowledge products generated to inform sectoral policy and planning.	<ul style="list-style-type: none"> • At least 15 knowledge products produced and disseminated. • Strategies drafted on <i>National Rice Development</i> and <i>Agricultural Land and Water Management</i>. • <i>Chosso</i> • No of international and national dialogues where <i>Chosso</i> makes active contribution. • Support to drafting and operationalization of a Climate Services Framework. • Revitalized and effective secretariat to coordinate climate change issues. 	<ul style="list-style-type: none"> • Knowledge products written, multi-media. • Sectoral strategy papers. • Project progress reports. • Supervision and MTR reports. 	<ul style="list-style-type: none"> • Development and retention of trained specialists within knowledge management cadre.

I. Strategic context and rationale

A. Country and rural development context

1. **Background.** The *Chosso* is supplementary climate financing for the IFAD-initiated co-financed National Agricultural Land & Water Management Development Project (*Nema*), which has been under implementation since the start of 2013. *Nema* has an estimated total cost of USD 65 million, financed with external contributions from IFAD (52.9% of total project cost), AfDB (18.2%) and IsDB (23.1%). *Chosso* is being additionally financed from IFAD's Adaptation for Smallholder Agriculture Programme (ASAP) with a grant of USD 5.0 million.

2. *Chosso* was designed through an extensive stakeholder consultation process. Field visits and consultations with all key stakeholder groups were undertaken, discussions were held with relevant Government of The Gambia (GoTG) institutions and development cooperation partners, and their inputs helped shape the supplementary project design.

3. **Country economic and social development.** The population of The Gambia is about 1.88 million, with half concentrated in rural areas and 60% of the total population under 25 years of age. Agriculture is an important driver of the Gambian economy, providing some or all the income of around 70% of the population and accounting for above 20% of GDP and 70% of the nation's export earnings. However, the potential of the agricultural sector to make a greater contribution to the GDP is constrained by the rapid depletion of the natural resource base, the dependence on rainfed agriculture and the sensitivity and exposure to climate variability and change.

4. Agriculture is the principal source of livelihood for the rural population and for the majority of households below the poverty line. The agriculture sector is characterized by: small-scale subsistence rainfed crop production mostly undertaken during a single rainy season from June to October; traditional livestock rearing; semi-commercial groundnut and horticultural production; small-scale cotton and a large artisanal fisheries subsector. Only about 6% of the irrigation potential has been utilised.

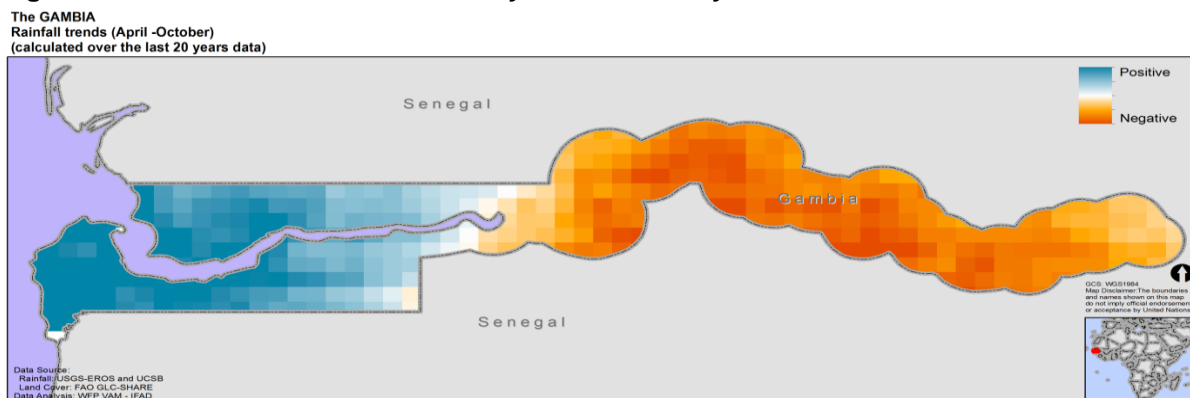
5. **Poverty reduction strategy.** The Gambia has a *Vision 2020* strategy, which seeks to transform the nation into a dynamic middle-income country, socially, economically and scientifically, over a 25-year period. It contains six major activity areas comprising Agriculture, Industry, Trade, Tourism, Financial Services and Human Resource Development. *Vision 2020* is to be realised through a series of medium-term programmes, the current phase being the *Programme for Accelerated Growth and Employment 2012-15 (PAGE)*, implemented through *Priority Action Plans (PAPs)* encompassing various sectors. The main thrust of the PAGE is to improve, *inter alia*, employment levels, per capita incomes, social services, gender equity and The Gambia's economic competitiveness.

6. **Climate change adaptation strategy.** The immediate priorities for climate change adaptation in The Gambia are outlined in the *National Adaptation Programme of Action (NAPA, 2007)* based on observed climate trends and projections. The process for developing the longer-term *National Adaptation Plan* is still ongoing concurrently with the *Low Carbon Development Strategy*. These strategies are based on future climate projections and take cognisance of current climate risks.

7. The climate in The Gambia is characterized by a short rainy season from June to October and a long dry spell from November to May with a mean annual rainfall of 900 mm in the Southwest and 500 mm in the Northeast (*Gambia National Agriculture Investment*

Plan (GNAIP), 2010). The country experiences significant levels of naturally occurring multi-annual and multi-decadal variability. Wet season rainfall in The Gambia has decreased significantly between 1960 and 2006 at an average rate of 8.8 mm per month per decade, leading to aridity in the uplands and acidity and salinity of soils in the lowlands as well as decreasing average annual flows of the River Gambia. Rainfall records from the last 20 years illustrate a particularly negative trend in the eastern part of the country, (see Figure 1 below). A 2014 crop assessment report shows that, as of August, the country average rainfall stood at 41% below the normal trend.

Figure 1: Rainfall trends over the country for the last 20 years



8. The larger overall drying trend of the last 40 years has had a profound impact on water resources: dried up springs and streams and falling water tables, contraction of seasonally-flooded swamps and enhanced saline intrusion. The Saline Front has been observed to move far inland, penetrating what is conventionally known as a perennially freshwater area. Since the 1960s, large areas of freshwater swamps in Western Gambia have been replaced by salt pans or salt-water marshes as a result of reduced fresh water inflow from storm runoff, preventing rice production in North Bank Region (NBR) and Western parts of Central River Region (CRR). Mean sea level has increased by 0.19 cm from 1901 to 2010, mainly due to ocean thermal expansion and glacial melting, though the effects on agriculture in The Gambia have not been discerned.

9. **Climate risks threatening The Gambia.** Global Climate Models (GCM) agree that climate change will lead to higher temperatures but they disagree on the direction of change for rainfall, though the tendency is for reduction, (*Second National Communication*, 2012, and University of Oxford, 2006). The models agree that temperature increases will be significant and that rain will reduce in the wet season. Rates of evapotranspiration are expected to increase within a range of 2% to 45%. Extremes in temperature will become the norm with substantial increases in the number of hot days and nights by the 2090s, projected to happen rapidly in the east of the country.⁴ The proportion of total annual rainfall that falls in heavy events tends towards decreases in January-February-March and April-May-June and to increase in July-August-September and October-November-December. The latest IPCC report states that, if the current greenhouse gas emission trends continue, sea level rise could gradually reach 98 cm by the end of the century. The sea level rise is considered a threat mainly for the coastal areas, with visible adverse effects on the beaches and infrastructures. Adverse impact on agriculture, particularly in tidal irrigation areas, is less

⁴ 'Hot' is defined by the temperature exceeded on 10% of days in the current climate of that region and season. Projections indicate that 'hot' days will occur on 22-48% of days by 2060 and 35-69% by the 2090s. Nights that are considered hot for the annual climate of 1970-99 are projected to occur on 28-50% of nights by the 2060s and 36-69% by the 2090s.

evident at present as salt-water intrusion is not observed in the zone that is considered perennially freshwater suitable for tidal irrigation (see figure 4 in appendix 2). However, the magnitude of sea level rise coupled with other future development plans upstream of the River Gambia will need to be closely monitored and deeper investigations that would be possible undertaken will be important to provide further understanding of the changing river dynamics as directly or indirectly impacted by climate change.

10. A study on the impact of the salt intrusion problem, covering 25 communities in the worst-affected areas in West Coast Region (WCR), NBR and Lower River Region (LRR) confirmed that close to 1,400 ha have been affected by salt, impacting adversely on a large proportion of rice fields and reducing yields, (UNDP, 2014). Salt intrusion was cited as the principal factor causing food insecurity.

11. Prioritised adaptation measures to the above climate risks set out in the Second National Communication include:

- establishment and expansion of community natural forests, plantations, national parks and forest parks;
- expansion and intensification of agroforestry and reforestation activities;
- selection of pest- and disease-resistant and salinity- and drought-tolerant high-yielding crop varieties under local conditions;
- change in planting dates and replacement of long-duration upland and lowland rice varieties with short-duration varieties;
- demonstration, promotion and diffusion of improved post-harvest technologies;
- expansion of tidal/flood irrigation and use of more water-efficient irrigation technologies such as sprinkler and drip;
- adoption of deep-rooted, salt-tolerant tree/grass species and flood-tolerant crop species; and
- amendments to improve soil nutrient content and water holding capacity.

12. **Rural poverty analysis.** Poverty in The Gambia is largely a rural phenomenon with nearly half of rural households falling below the food poverty line, (GNAIP 2011-2015); a significant proportion of these is female headed. There are multiple causes of rural poverty: income insecurity resulting from weather-induced crop failures; shortages of cash forcing farmers to sell their produce immediately after harvest at low prices and then buy back grain at high prices during the hungry season (August–September); rising costs of living; and a lack of alternative income-generating opportunities. The Gambia's rural communities are dependent upon the natural resource base and rainfall and therefore significantly vulnerable to climate change and worsening environmental conditions.

13. **Gender and youth dimensions.** One in five households in The Gambia is headed by a female, mainly because of the migration by males to urban areas and overseas. Women's poverty is closely linked to their high illiteracy level, the absence of economic opportunities, inadequate access to economic resources, including credit, land ownership, skills and support services. The factors that make women vulnerable, such as poverty, power relations, lack of economic power, low level of education and lack of or limited technical knowledge, are also the key issues for youth.

14. The impact of salt intrusion in the rice fields affects women disproportionately since traditionally they are the rice growers. The damage done to the rice growing ecologies has reduced significantly their contribution to the household food basket, which lowers their social status since they became more dependent on men, who increasingly might see them as liabilities. The environmental damage has also increased labour intensity for women by forcing them to venture into alternative income generating activities such as incense collection, baobab, *timbingo*, bush berries, travelling afar to collect and sell fire wood, dry season upland gardening to grow vegetables and as hired labour for washing clothes and threshing millet and maize, (UNDP, 2014).

15. The salinity affects cashew and mango plantations, particularly in NBR, and water supply for domestic consumption has been seriously affected. The abandonment of lowlands for agriculture has led to increased farming pressure on the uplands leading to reduction in soil fertility and productivity. Dwindling soil fertility and productivity has forced the communities to clear more of the upland forest vegetation. Youth and men in the communities engage in illicit timber trade and pervasive exploitation of forest products to earn income, in order to buy rice for their families since neither lowlands nor uplands are yielding optimum returns. Charcoal, firewood and timber production has increased, even using fruits trees such as mangos and cashew branches. This phenomenon has exacerbated water and wind erosion leading to the creation of huge gullies and siltation in the lowlands, (UNDP, 2014). It has also increased the occurrence of conflicts between herdsmen and farmers. The disappearance of the upland forest had led to a reduction in the availability of wild fruits like palm trees, oil palms, *kaba*, *folay* and monkey bread.

16. Rural women who do not own land mostly have access to unproductive (infertile) land, which is also small in extent. Women's farmlands are in most cases fragmented, making the movement of women between fields frustrating and time consuming. With no security on tenure, women cannot access credit and they remain economically dependent on their husbands. Farm implements are mostly owned by men. Women have access to them but after men have completed work on their fields.

17. Evidence indicates that discriminatory socio-cultural practices prevent gender equity notably in areas of access to productive resources (farm inputs, implements, land and capital), access to service delivery and decision-making. This affects food self-sufficiency and food security, and constrains the ability of women to move from subsistence to commercial farming to maximize their income. Furthermore, women lose up to 50% of their agricultural production because of lack of access to markets, and proper communication, storage, and transportation facilities. This reduces the productivity and income of women, increases their health risks and reduces their ability to engage in other productive ventures. Female education is also compromised because girls may be required to support their mothers in their domestic chores.

18. Poverty also has an important youth implication, as the national population is skewed heavily towards younger age bands, with about 44% of the population aged 0-15 years. Farming, like hunting and fishing, is becoming less attractive to the youth, and coupled with their desire to seek a better future in urban settlements and abroad, the mass exodus of youth from rural to urban areas will have important consequences for agricultural production, notably labour availability.

19. Other major causes of poverty and vulnerability are power structures that keep women and youth in marginal positions, and market and institutional-related factors such as

- the cost and timely availability of agricultural inputs;
- limited economies of scale to encourage and attract investment in mechanized farming;
- under-performing support institutions that deliver essential services of extension, research, finance and information;
- poor infrastructure which limits access to markets; and
- the weak capacity of producer organizations.

20. The Humanitarian Country Team in The Gambia report that in the period January to December 2014, 19.5% of the total population was in need of humanitarian aid, with a significantly high proportion of food insecure in WCR, CRR and some parts of LRR. Declines in food production in 2014 was predicated on delays in access to seeds and the high cost of fertiliser, as well as the poor, erratic and unevenly distributed rainfall.

B. Rationale

21. **Project context.** The most recent IFAD Country Strategic Opportunities Paper (COSOP) for The Gambia was developed in 2003 covering a period up to 2013. It advanced project ideas that are being consolidated and realised through the IFAD-initiated National Agricultural Land and Water Management Development Project (*Nema*). Implementation started in February 2013 for a seven-year period. *Nema* seeks to reduce the rural poverty of women and young people by increasing their incomes from improved productivity based on sustainable land and water management practices, to be achieved through two substantive project components: Watershed Development (86.7%) and Agricultural Commercialization (13.3%). As the full title of *Nema* indicates, the project concentrates investments on securing and managing properly the dominant physical factors in agricultural and livestock production: usable water and fertile soil in watersheds. The project is national in scope and operating at a scale that should enable a significant proportion of rural households to increase their incomes from natural resource-based activities and thereby achieve food security.

22. The following are notable *Nema* implementation achievements to date:

- 50 Farmers' Field Schools on both rice and vegetable production have been established and operationalized;
- 25 adult Functional Literacy Classes set-up and operational;
- signed MoUs with four participating financial institutions through a tripartite financing arrangement which is being replicated by other projects;
- supported development and validation of a National Rice Development Strategy in collaboration with Coalition of Africa Rice Development;
- through a Technical Assistance, supported the development and operationalization of an Agricultural Sector M&E system which has enabled all projects under MoA to be fully anchored to one central national system;
- signed contract for ongoing works on 160 ha of Tidal Irrigation Schemes and 1,000 ha of lowlands development, (dikes and spillways, causeways and bridges);
- supported National Agricultural Research Institute to produce 9 mt of assorted rice foundation seed through adaptive research and a contract signed with rice seed growers for multiplication, certification and dissemination; and

- the *Nema* PSU is highly recognized as the prime entry point in providing technical and advisory support to GoTG for dialogue with other donors/partners interested in the agricultural sector as well as coaching and mentoring other project staff in MoA.

23. The 2003 COSOP cited weather-related risks as prominent among the multiple causes of rural poverty and accordingly *Nema* was designed with due regard for average climate risk conditions. During the first two years of implementation, however, national and international awareness has grown rapidly of the reality of climate change and its potential for undermining investments in natural resource-based income-generating activities and increasing the exposure of smallholders (majority women farmers) to the negative impacts of climate change. The deterioration of the agro-climatic environment now threatens the full achievement of the flagship *Nema* project itself.

24. **Problem statement.** A number of studies have concluded that community vulnerability to climate change is likely to remain high in The Gambia given the interrelated system dynamics between the climate hazard and land, hydrology and ocean tides into the River Gambia. As a result, the GoTG and development partners are seeking optimal solutions better to address the climate resilience of the country's economy, which remains highly vulnerable to external shocks. Increasing climate variability was manifested with the late onset, poor distribution and low intensity of the rains in the 2014 growing season, which affected crop production and led to multiple replanting in some cases, with losses that vulnerable households can ill afford in the country.

25. It is imperative to ensure that *Nema* investments can work effectively in a situation of increasing intensity of rainfall and sea level rise and that the target communities are able to protect their livelihoods even in extreme climatic conditions. In a broader sense, there is a pressing need to ensure effective and systematic mainstreaming of climate risk management in decision-making processes at the community level in order to avoid losses associated with crop failures. This also applies to the public sector to plan for food security emergencies, principally through the generation and integration of climate risk data in decision-support tools and policy processes.

26. **Rationale.** The objective of additional climate finance is to optimize the effectiveness of *Nema* interventions in the face of increasing climate-related threats to smallholder agriculture, and thereby increase the capacity of smallholder farmers to expand their options in a rapidly changing environment, contribute directly to the realisation of the NAPA and to complement other climate change adaptation initiatives.

27. The proposed activities are intended to promote climate change resilience within the ongoing robust *Nema* framework. The logical framework underpinning *Nema* is not disturbed, in particular with regard to the concentration of resources on a narrow range of high priority interventions.

28. The proposed *Strengthening Climate Resilience of the National Agricultural Land and Water Management Development Project* is expected to add considerable value to *Nema*, despite costing only one twelfth of the parent project, with strategic investments in natural resource restitution and protection (public goods) to counter climate change and promote the resilience of the rural economy. To this end, the supplementary *Chosso* interventions are cast as either:

- **modifications** (M) to the *Nema* design necessitated by accelerated climate change, several of which GoTG and the project management are already addressing in the light of implementation experience, to ensure that the original

scope of the project is maintained; the emphasis will be on minor adjustments to the original infrastructure design and the scope of community management capacity-building for which any incremental cost is covered by *Chosso*; or

- **enhancements (E)** to the *Nema* design, intended to consolidate and extend the project's investments in natural resource remediation and productive infrastructure, particularly with regard to the operation and maintenance of community water harvesting schemes and community forest restitution. These are two intervention areas that are deemed highly complementary to the spirit and purpose of *Nema*.

Box 1: Community indigenous early warning system: there is 'Chosso' in the River

Indigenous knowledge, for many centuries, has continued to play a major role in getting communities plan, prepare and take actions to respond to any imminent threat to their environment. The Gambia is not an exception to this historical phenomenon. In the permanent fresh water zones of the River Gambia, run-off from the uplands together with sediments and other man-made pollutants contaminate the river, which has been in the past a source of drinking water and other uses especially for riparian communities. This was the situation for community members especially in Barajally, who used the river water for their household needs. However, knowing the detrimental health effects of the poor quality of the river water, the community had long devised a traditional system of alerting community members whenever the quality of the river water became degraded. This historically occurs around August-September when community members visually observe and confirm that the river water changes colour to reddish brown. At this point, the river water is not suitable for domestic purposes such as drinking and washing. Members charged to monitor this are obligated to ring the alarm bells by shouting that there is a '**Chosso**' in the River and from then on members of the community avoid using the river water until they are advised otherwise. Thus, '**Chosso**' could literally refer to "change". It means a traditional alert system requiring community members to react positively to an observed negative change in their environment.

As this was narrated to the *Chosso* detailed design team in Barajally, which is a site for Tidal Irrigation development under *Nema*, the design team unanimously agreed to use "*Chosso*" as a symbolic broader meaning of the *Chosso* project.

Source: *Chosso* detailed design mission field visit to Barajally, 2 February 2015.

II. Project description

A. Project area and target group

29. **Project area.** *Chosso* will reflect the countrywide scope of *Nema*, with an inclusive approach to supporting GoTG in mainstreaming climate change in national and regional policies and practices through resilience research and climate policy dialogue. Climate change sensitization and adaptation training will reach a wide audience.

30. On the ground, *Chosso* will target mainly a subset of interested and committed communities based on the condition and climate vulnerability of their watersheds and the potential impact of the prioritised interventions to address their particular identified climate risks. Design modifications to climate-proof tidal irrigation, lowland and upland water control and vegetable garden irrigation structures will be confined to schemes already included in the *Nema* scope of work.

31. Specific criteria will be refined for the selection of the most suitable watersheds and locations for the substantial "new" *Chosso* interventions, notably in *Community water harvesting* and *Community forest restitution*. The project will prioritise watersheds in the seasonally saline areas (mainly Central and Lower River Regions) which are more vulnerable to the hydrological dynamics affected by climate change and where lowland and tidal rice fields are located, and the permanently saline areas of the country (North Bank and West Coast Regions) that are coping with soil salinization, which is expected to worsen with climate change. Water harvesting and forest restitution (including mangrove restoration) will offer livelihood buffers to communities currently reliant on lowland and tidal rice production

systems which are threatened by saline water intrusion in low rainfall years as well as upland farms which are subject to run-off and increasing aridity in low rainfall areas. Similarly, the eastern part of the country is most vulnerable to drought (see figure 1) and thus water harvesting will be prioritized.

32. Farmer level climate risk management will be linked to all farmer field schools. All regions are vulnerable to warming and drying trends with impacts on both surface and ground water resources, which will offer useful learning insights into differential impacts of changing weather patterns and how weather and extension advisories need to change according to the region being considered.

33. **Project target group.** The primary *Chosso* target group comprises an estimated 88,062 poor people (about 11,007 households⁵) benefitting directly from tangible NR investments in soil, water and trees as well as through resilience capacity and improved knowledge management. These comprise 41,107 rural poor people already engaged in *Nema* activities and 46,955 rural poor people expected to participate in the enhancement activities through *Chosso*. Many of these and other people will also benefit from capacity building (individual and group management, and climate change adaptation skills) and access to greatly improved climate risk and hydrological information services. Beyond *Nema*, smallholders, livestock operators and river fishers throughout the sector stand to benefit indirectly from advances in the scientific and technical understanding of climate change for The Gambia and in the generation of cost-effective responses on-farm and at community and watershed levels.

B. Development objective and impact indicators

34. *Chosso* has the same goal, development objective and overall outcomes as *Nema*, with an important additional outcome: the enhanced resilience of the targeted beneficiaries. The goal of *Nema* is reduced poverty of rural women and youth and the objective is increased incomes from improved productivity based on sustainable land and water management practices. The added value of ASAP funding is reduced vulnerability from climate-induced hazards and increased adaptive capacity in a changing environment.

C. Outcomes/components

35. The project comprises specific climate risk management activities integrated fully within the *Nema* design. An innovative feature of the initiative is the blending of climate adaptation financing to enhance an ongoing project. The *Nema* established outcomes are: improved productivity of scarce agricultural lands; improved farm-to-market access roads; strengthened producer capacity; agricultural enterprise promotion; technical support services; effective and operational national M&E mechanisms in place to support proactive sectoral development; and knowledge products generated to inform sectoral policy and planning. *Chosso* will add value to each of these activities (except access roads and enterprise promotion) and broaden the overall scope with water harvesting and forest restitution.

Outcomes

36. Selected ASAP-related outcome indicators will comprise:

⁵ Assuming a conservative household size of eight people as household sizes in the rural areas are above eight.

- number of poor smallholder household members whose climate resilience has been increased (disaggregated by gender);
- increased area (in hectares) of land managed under climate resilient practices;
- number of households with improved access to water for productive purposes;
- number of community groups (including women's groups) involved in ENRM and/or Disaster Risk Reduction (DRR) formed or strengthened; and
- number of international and country dialogues where *Chosso* or *Chosso*-supported partners make an active contribution.

Components

37. Climate change adaptation financing (the ASAP grant) has been integrated with different components of *Nema* to improve adaptive capacity, for examples: to improve the availability and flow of climate risk information; to provide access to know-how and technologies which help farmers to reduce, diversify or transfer risk; to strengthen individual and institutional capabilities to recognize and analyse new and emerging risks; and to develop institutional partnerships to enhance participation in rural planning processes.

38. *Chosso* activities are set firmly in the framework of the ongoing *Nema*, which comprises two substantive components – *Watershed development* (79.5% of total project cost) and *Agricultural commercialization* (12.2%) – supported by *Project facilitation* (8.3%).

39. The following sixteen *Chosso* subcomponents are presented as either modifications (identified as “M”) to the *Nema* design under implementation, to ensure that the planned outcomes are protected to the extent possible against the adverse effects of climate change, or as enhancements (“E”) that enlarge the scope of *Nema* expressly to restore the damaged productive natural resource base, to enhance the adaptive capacity of the target beneficiaries, and to learn how to increase the resilience of the rural economy for future generations. Of these, the only new subcomponents/activities introduced to the *Nema* structure are *1.2.5 Community water harvesting* and *1.5 Community forest restitution*. For clarity, the following table relates the supplementary *Chosso* interventions to the corresponding *Nema* subcomponents. The same component/subcomponent classification system is used for each project.

Table 1: Chosso additional activities and funding for Nema project.

Nema components	Nema USD '000	Nema % base	Chosso USD '000	Chosso % base	Chosso additional	Chosso subcomponents Modifications (M) & Enhancements (E)	Combined USD '000	Combined % base
Watershed development	40,789.5	77.9%	3,719.0	75.1%	9.1%		44,508.5	77.6%
1 Communal watershed planning.	167.4	0.3%	221.0	4.5%	132.0%		388.4	0.7%
	0.0	0.0%	221.0	4.5%	new	1.1 Community adaptation management capacity. (E)	221.0	0.4%
2 Water management for rice cultivation.	25,538.2	48.7%	1,649.3	33.3%	6.5%		27,187.5	47.4%
	8,978.4	17.1%	349.8	7.1%	3.9%	2.1 Tidal irrigation scheme design adaptation. (M)	9,328.2	16.3%
	14,303.4	27.3%	342.4	6.9%	2.4%	2.2 Lowland water control infrastructure adaptation. (M)	14,645.8	25.5%
	2,292.8	4.4%	274.5	5.5%	12.0%	2.3 Upland water control infrastructure adaptation. (M)	2,567.3	4.5%
	0.0	0.0%	682.7	13.8%	new	2.5 Community water harvesting. (E)	682.7	1.2%
3 Village vegetable schemes.	7,508.2	14.3%	108.8	2.2%	1.4%		7,617.0	13.3%
	4,434.8	8.5%	67.2	1.4%	1.5%	3.1 Climate-proofing <i>kafo</i> women vegetable schemes. (M)	4,502.0	7.9%
	3,073.4	5.9%	41.6	0.8%	1.4%	3.2 Climate-proofing youth vegetable schemes. (M)	3,115.0	5.4%
4 Access roads and market infrastructure.	7,575.7	14.5%	0.0	0.0%	n/a	2.4 Access roads and market infrastructure. (n/a)	7,575.7	13.2%
5 Community forest restitution	0.0	0.0%	1,740.0	35.1%	new		1,740.0	3.0%
	0.0	0.0%	292.5	5.9%	new	5.1 Community agroforestry. (E)	292.5	0.5%
	0.0	0.0%	247.5	5.0%	new	5.2 Community woodlots. (E)	247.5	0.4%
	0.0	0.0%	1,200.0	24.2%	new	5.3 Mangrove restoration. (E)	1,200.0	2.1%

Nema components	Nema USD '000	Nema % base	Chosso USD '000	Chosso % base	Chosso additional	Chosso subcomponents Modifications (M) & Enhancements (E)	Combined USD '000	Combined % base
Agricultural commercialization	6,976.7	13.3%	419.0	8.5%	6.0%		7,395.7	12.9%
1 Capacity development of producer organisations.	2,825.3	5.4%	70.0	1.4%	2.5%		2,895.3	5.0%
	0.0	0.0%	70.0	1.4%	new	1.1 Climate resilience for producers. (E)	70.0	0.1%
2 Value addition: rice and vegetables.	2,126.0	4.1%	0.0	0.0%	n/a	2.0 Value addition: rice and vegetables. (n/a)	2,126.0	3.7%
3 Technical support services.	2,025.4	3.9%	349.0	7.0%	17.2%		2,374.4	4.1%
	0.0	0.0%	81.0	1.6%	new	3.1 Capacity building of technical service providers. (M)	81.0	0.1%
	0.0	0.0%	72.0	1.5%	new	3.2 Climate risk information services. (E)	72.0	0.1%
	0.0	0.0%	196.0	4.0%	new	3.3 Hydrological information services. (E)	196.0	0.3%
Project facilitation	4,622.3	8.8%	814.2	16.4%	17.6%		5,436.5	9.5%
1 Project management and implementation support.	3,105.7	5.9%	349.2	7.1%	11.2%		3,454.9	6.0%
		0.0%	349.2	7.1%	new	1.1 Climate change management capacity. (E)	349.2	0.6%
2 Knowledge management, Monitoring & Evaluation.	1,516.6	2.9%	465.0	9.4%	30.7%		1,981.6	3.5%
		0.0%	465.0	9.4%	new	2.1 Resilience research and climate policy dialogue. (E)	465.0	0.8%
Total base cost	52,388.5	100.0%	4,952.2	100.0%	9.5%		57,340.7	100.0%
Physical contingencies	4,393.0	8.4%	392.2	7.9%	8.9%		4,785.2	8.3%
Price contingencies	8,220.2	15.7%	352.0	7.1%	4.3%		8,572.2	14.9%
Total project cost	65,001.7	124.1%	5,696.4	115.0%	8.8%		70,698.1	123.3%

Component 1: Watershed development

1.1 Communal/*bantaba* watershed planning subcomponent.

40. **Chosso 1.1.1 Community adaptation management capacity (Enhancement ~ 4.5% of estimated total project base cost).** Chosso will undertake a campaign of community climate change sensitization at start-up, aimed at engendering understanding by the general public and stakeholders on the causes, effects and impacts of climate change on natural resources and livelihoods. The campaign will be conducted using a variety of channels and presentations of clear and focused messages on climate change at national, district and village/*bantaba* levels. This activity will enhance the capacity of communities to manage proactively the productive resources upon which their livelihoods depend, particularly in the context of the changing climate. The current communal/*bantaba* planning activities would be strengthened using watershed management plan models⁶ based on simulations of rainfall and hydrological occurrences recorded in GIS-based thematic maps.

41. In close collaboration with the Department of Community Development (DCD), Chosso would develop a locally appropriate climate change adaptation curriculum and training tools, conduct Training of Trainer (ToT) sessions for 30 existing Multidisciplinary Facilitation Teams (MDFTs) of seven specialists across the country, and then promote step-down training in adaptation approaches and techniques for 120 communities. The selection of communities from those expressing a strong interest in the training in adaptation techniques will be informed by the climate vulnerability assessment in the initial Chosso baseline study.

1.2 Water management for rice cultivation subcomponent.

42. **Chosso 1.2.1 Tidal irrigation scheme design adaptation (M ~ 7.1%).** The tidal irrigation scheme (TIS) infrastructures, utilising the tidal rise and fall of the river level rather than mechanical pumping, are affected by climate change because the river flow deficits result in a reduction in the rise of water levels during the rainy season. Intense rains could become more frequent occurrences with climate change, resulting in adverse consequences such as the prolonged flooding of rice fields by direct rain falling in the plots. The concentrated rains falling on degraded uplands result in increased sedimentation, which, with weed growth, hinders the flow of water in primary canals requiring periodic desiltation that is a costly exercise for farmers. Some fine tuning of the design specifications of irrigation structures and access causeways is proposed to ensure the economic life of the *Nema* TIS in the face of deteriorating hydrological scenarios related to climate change.

43. On a full-scale pilot basis, the primary canal of a number of TI schemes would be lined (4 km length of canal in total) together with the concretion of about 16 water distribution control structures/gates to cover a target of 160 ha under command. The coating would be reinforced concrete, masonry cement or other sealing material that ensures good weather resistance. The lining of these canals will minimise weed growth and sedimentation that impede water flows and will potentially intensify as temperatures increase. The lining will result in a reduction of the width of the primary canal required for the same command area and compensate for the seepage and percolation losses associated with water flow in the main canal. The technical design will thus be adjusted to improve water conveyance and distribution efficiency. In locations with a greater risk of flooding, a drainage system would be established on newly created schemes. Complete and detailed topographic studies would be done to ensure a drainage plane that removes excess water from plots within 48 hours.

44. To ensure the sustainability of the major *Nema* investments in tidal irrigation, Chosso would enhance the water management/monitoring and operational capacity of the users of the schemes. *Nema's* ongoing

⁶ NEA has modelling software called TerrSet (Geospatial Monitoring and Modelling System) which comprises different thematic modelling tools, for examples Land Change Modeller, Ecosystem Services Modeller, Climate Change Adaptation Modeller, among others. This capability will support the project to model the climate vulnerability in each community/village to enhance the decision-making process and prioritization of subsequent interventions.

capacity-building programme, being provided to various farmer-based organizations and associations, would be augmented with practical training in scheme management to four water user groups (WUGs) given the responsibility for operating and maintaining TIS.

45. **Chosso 1.2.2 Lowland water control infrastructure adaptation (M ~ 6.9%).** With chronic lower consecutive run-off to rainfall, paddy fields in the lowlands bordering mangroves are becoming saltier and rice cultivation more and more difficult in these areas. The realization of side embankments can strengthen the presence of fresh water to the detriment of salt water and conserve the riverine-marine environment conducive to the growth of mangroves. The creation of drains perpendicular to the river or its tributaries is a good technique to desalinate rice land over time by promoting the leaching of salts when the tides invade rice fields during the dry season.

46. The installation of lowland water control structures for rice cultivation is the central feature of the parent *Nema* design, accounting alone for 26.7% of the total estimated cost of the project's substantive investments. The standard design specifications of the dikes, bridges, spillways and related water control structures, particularly the most appropriate materials and the use of labour-intensive construction methods, have been and continue to be reviewed and adjusted by *Nema* managers with due regard to the cumulative experience of the first two years of implementation. *Chosso* would meet the additional costs of modifying the designs of structures to ensure their economic life in the face of deteriorating conditions related to climate change. The supplementary investment would fund the surveys, studies and incremental costs for modifying the design of a nominal 18 km of dikes and ancillary infrastructure to cover a target of 720 ha.

47. **Chosso 1.2.3 Upland water control infrastructure adaptation (M ~ 5.5%).** The *Nema* design specifications of the upland water control structures would also be refined in response to a progressively better understanding of the consequences of accelerating climate change, (primarily the increased intensity of rains over shorter time periods), and to implementation experience. Possible design modifications may include a series of dikes with reduced height, an adapted dike constructed at the most critical location, and/or the addition of structures to store diverted run-off for later use within the watershed, (see 1.2.5 *Community water harvesting* below).

48. *Chosso* will ensure a greater resistance to the adverse effects of climate on a nominal 15 km of upland water control structures covering a target of 600 ha by: requiring service providers to invest more in the analysis of the foundation ground and choice of building materials; enhancing the stability of structures within the rules of construction and the cohesion of the materials used, (tests would indicate the most stable slopes function of the height of dikes); and studying the topography of floodplains in order to optimize the creation of run-off water control dikes. These studies would help to rationalize the implementation of water run-off control infrastructure. On flat terrain, space between bunds may be much more important than on steep slopes.

49. **Chosso 1.2.5 Community water harvesting (E ~ 13.8%).** Recent sectoral reviews have identified surface water harvesting, storage and efficient use, in particular of rainwater, as increasingly important in combating the adverse effects of climate change. Rainwater harvesting has not been regarded as a priority in The Gambia hitherto, but now offers an important opportunity to supplement supplies at the community level for off-season market gardening, livestock, fishponds and other productive purposes. Rural communities are faced with increasing demand and decreasing aggregate water supplies for all purposes, particularly given the prohibitive cost of pumping.

50. *Chosso* would seek affordable opportunities to pilot new and/or modified surface water capture structures to supplement communities' traditional reliance on groundwater and river abstraction for non-rainfed agricultural purposes, including livestock. The central idea is to capture and store surface water during the rainy season before it runs into the river system for use in the long dry season. However, the

scale and technologies of the proposed schemes would preclude the utilization of stored water either for the irrigation of extensive field crops or for domestic water supplies.

51. Whereas rainwater running into the upper reaches of the River Gambia may be utilised for irrigation downstream, the tributaries flowing into the saline lower reaches and estuary are not used for productive purposes, albeit they provide ecosystem services, with the brackish water pushing further upstream in many cases. The complicated hydrology of the river system and the aquifers coupled with increasing demand place a premium on conserving groundwater and moving from less to more efficient uses of finite supplies from all sources. Consequently, *Chosso* would seek feasible opportunities for downstream communities to make better use of perennial watercourses through capture structures, barriers to saline water incursion and/or other locally appropriate technologies.

52. Community water harvesting would constitute an enhancement of the scope of *Nema* in line with communal/*bantaba* expressed priorities and an opportunity to pilot alternative modalities for future up-scaling. Within the context of climate change adaptation, the project would identify those upland communities in the Central and Eastern parts of the country that are becoming increasingly vulnerable to water shortages in the dry season as a consequence of decreasing rainfall and increasing human and animal populations, and that express an interest in constructing and maintaining a water harvesting structure.

53. It is likely that the main demand for supplementary productive water sources would come from communities in URR and CRR, the areas predicted as more vulnerable to declining rainfall patterns. However, water harvesting structures may also be appropriate for communities in WCR, NBR, URR and LRR with increasing ground and riverine water salinity challenges. *Chosso* would assess the potential for and feasibility of requested community water harvesting infrastructure very close to the interested settlements by commissioning a comprehensive site identification exercise focused on hydrological, topographical and geotechnical factors.

54. The four pilot affordable schemes proposed as suitable for communities are:

- *earthen trenches*, formed by excavating material to enlarge a natural or manmade depression that is recharged by rainfall from the watershed. Each pond, with a target storage capacity of 1,500 m³, would be fenced to control access and the margins planted to reduce siltation. Water would be lifted by hand into animal drinking troughs or for application to vegetables. Fish farming would be possible if the community chose to retain a minimum water level in the pond throughout the year and undertook to prevent pollution from the catchment area. Each trench structure would have a nominal target group of 375 users and an estimated investment cost of USD 23,625;
- *stand-alone run-off capture structures*, comprising small and micro retaining dams to impound fresh and used surface water including excess/flood waters in extreme rainfall events with a target storage capacity of 4,500 m³. These structures can be realized with homogeneous or heterogeneous land depending on the availability of materials, with riprap, gabions, cement masonry, concrete weight or reinforced concrete. The advantage of structures above the fall-line is the possibility of withdrawing water by gravity by pipe through the dam. Each run-off capture structure would have a nominal target group of 1,125 users and an estimated investment cost of USD 49,875;
- *incorporated run-off capture structures*. There may be opportunities to add water capture infrastructure to *Nema*'s planned water management investments in the uplands to slow surface run-off and manage flood events. Currently, the standard *Nema* surface water management structures are designed to optimise the use of rainwater and minimize flood damage at a watershed level, but not to impound excess water for use in the dry season. On a case-by-case basis, the project would consider broadening the scope of planned water management schemes to incorporate a structure to impound some of the water draining from the watershed with a target

storage capacity of 2,500 m³. Each run-off capture structure would have a nominal target group of 625 users and an estimated investment cost of USD 30,975; and

- *barrage saline water barriers*. Chosso would revive a tried and tested technology to prevent brackish water pushing ever-further upstream in tributaries flowing into the saline lower reaches and estuary of the River Gambia and thereby increase the availability of usable water to nearby communities. The appropriate structure is a low concrete “bridge barrage” with an impermeable skirt extending below the surface located strategically to prevent the incursion of saline water and impound a relatively small volume of water (target storage capacity of 800 m³) behind the barrage to the level of the spillway. Each barrage structure would have a nominal target group of 200 users and an estimated investment cost of USD 10,500.

55. In the context of piloting community water harvesting techniques for The Gambia, the project would support GoTG in implementing at least one of each of the four approaches outlined above. However, it is expected that the stand-alone schemes will predominate on a micro-project basis, with a community contribution of 10% of the investment cost. In all cases, the project will bear the full cost of site identification, design and supervision. For budgeting purposes, a nominal schedule of 24 Community water harvesting structures is proposed: 10 earthen trenches, 4 stand-alone run-off capture structures, 4 incorporated run-off capture structures and 6 barrage saline water barriers.

56. At the programme level, the anticipated benefits from these pilot *Community water harvesting* schemes would be: increased availability of water through the long dry season for 24 farming communities, (nominal 1,800 ha of productive land at 75 ha/community); social capital built up through the collective action of WUGs; and physical community assets created.

1.3 Village vegetable schemes subcomponent.

57. **Chosso 1.3.1 Climate-proofing *kafo* women vegetable schemes (M ~ 1.4%).** The imperative to be economical with groundwater on village vegetable schemes, in view of increasing water stress and demand, points to a modification of the irrigation design of *Nema*, with an additional initial cost offset by reduced labour requirements under operation. The aim is an uncomplicated system that delivers just enough water to the growing crops with the least effort. The minor modifications for the upgrading of 14 existing *kafo* women vegetable schemes relate to pumping systems and improved water distribution methods.

58. It is proposed to avoid water shortages in the gardens by boosting the installed capacity of the pumps with increased solar panel surfaces and by installing accumulation batteries to store energy during the hours when the sun is present, thereby permitting irrigation at night and through periods of cloudiness. For a more efficient and labour-saving water distribution system, it is proposed to replace the existing storage basins with gate valves to reduce water surface losses as evaporation increases with higher maximum temperatures. With the gate valve system, the water is not stored but taken directly for use at the plot. Chosso would also equip the gardens with spray tubes to reduce the hand-carrying of water by women over sometimes significant distances within the plots. Agroforestry techniques are proposed to reduce water losses further, including the planting of windbreaks and the use of organic matter in the soil and mulching to retain moisture.

59. The project would promote the purposeful management of scarce irrigation water to ensure its optimal use by the *kafo* women vegetable growers. Key activities would comprise training on the operation and management of the irrigation infrastructure as well as group and organizational capacity building.

60. **Chosso 1.3.2 Climate-proofing youth vegetable schemes (M ~ 0.8%).** As for the *kafo* women garden schemes, it is essential that groundwater be used sparingly and efficiently on eight new rural youth vegetable schemes. It is proposed to modify the design of the solar pumping system in the same way and for the same reasons. With the advantages of a new build and the prospect of more intensive production

modalities on the youth schemes, the project would install “microjet” irrigation equipment at the new sites. This is a form of irrigation that is close to the drip irrigation system but is less complicated and uses localized spraying.

61. The project will aim at the efficient management of the irrigation water by youths, who hitherto may have had relatively little experience in vegetable production. Key activities will comprise training on the use of the microjet irrigation technique, choice of crops, sequencing of planting in line with market demand, and the management of the water infrastructure, as well as group and organizational capacity building.

1.5 Community forest restitution subcomponent.

62. The aim of this new *Nema* subcomponent is to enhance the protection and stabilization of watersheds, which are exposed to increasing risks of extreme climate events, whilst providing livelihood adaptation security to communities from planting and management of indigenous and economic trees and the restoration of mangroves. *Chosso* would provide incentives for communities gradually to regenerate their degrading ecosystems. A great deal of damage has been done to the landscape over recent decades, far exceeding the rate of natural regeneration. The project would promote a rigorous programme of forest restitution combining the strategic replanting of appropriate varieties within watersheds with robust management arrangements to protect the shared natural resources and ecosystems in the public domain.

63. The direct economic benefits to vulnerable communities would include the increased production of timber, fuelwood, fish and oysters, fodder, herbs, honey, fruit and nuts as well as increased ecosystem services from the restituted watersheds. However, the reversal of the long term decline in the economic carrying capacity of the finite fragile natural resource base, as evidenced by the rapid disappearance of forest cover and declining on-farm yields, is of greater significance in sustaining incomes in the future and combating the negative effects of climate change. The medium- to long-term perspective required to realise benefits from these investments entails an important and essential role for the youth as a key target group. Though the forest restitution will benefit the entire community, the actual activities will be targeted at women as the predominant users of natural resources and youth as the generation that needs to practice any introduced approaches to the sustainable use of community resources.

64. Indirect and medium-term returns to investments would include: physical community assets created; greater energy security; increased rainwater infiltration with associated effects on groundwater levels; reduced soil erosion (enhancing soil quality) and river sedimentation; increased volumes of aquatic life and dependent species; shade and windbreaks; and protected river margins in perennially and seasonally saline areas. All investments would be in line with community priorities, plans and commitments. The three community forest restitution elements combined make up one third of the total estimated cost of *Chosso*.

65. **Chosso 1.5.1 Community agroforestry (E ~ 5.9%).** This substantial intervention is in direct response to the drive for greater climate change resilience for smallholders, namely, halting and reversing the present rate of loss of tree cover around settlements, in agricultural lands and within the watershed. The extent and speed of the deterioration of forest cover and the quality of the exposed topsoil within living memory is a matter of huge concern, described as “alarming” in NBR and URR.

66. Climate change is compounding the factors contributing to the declining economic carrying capacity of the productive land available to an increasing rural population. Profitable farming will not be an option for many of the children of the present farmers unless a concerted and sustained investment programme is undertaken to restore the natural landscape. Trees are central to arresting and reversing the steeply declining trend.

67. The emphasis of the *Community agroforestry* initiative is on the planting of indigenous species, which are more climate resilient, and the replacement of slow-growing trees that have been cut down. Tree planting in watersheds would begin to restore the original forest cover in the vicinity of beneficiary communities, primarily to stabilise soils and slow down rainwater run-off. In the buffer zones between the

uplands and lowlands) the re-vegetation would contribute to reducing the rate of degradation of the lowland landscapes and maintaining upland productivity. Around settlements, trees would provide multiple additional amenity values including shade, fruit and nuts, windbreaks and privacy.

68. Reported in-country experience of such initiatives has been dominated by the challenges of sourcing appropriate viable planting materials and providing the care and protection of seedlings through the first two years, particularly against prolonged dry spells, drought and browsing animals. The local wisdom is to concentrate on collecting and planting seeds from the immediate area rather than bringing in seedlings with poor survival rates and to devise and implement a robust natural resource management plan based on the commitment and mandate of the community to reduce the pressure on existing indigenous forests and allow for enhanced natural regeneration.

69. *Chosso* would respond to requests from communities planning to reconstitute a total of 500 ha of depleted forests close to settlements and in the “buffer zone” between the uplands and lowlands in those parts of the country adjudged most vulnerable to climate change. It is anticipated that about 20 communities will participate, each with an average of 25 ha of agroforestry under management. The aims would be to consolidate water control infrastructure, to re-establish continuous patches of mainly secondary woodland, and to encourage the process of recovery of the environment to the state prior to over-exploitation by the human population.

70. The intervention would build on country experience with a three-step approach comprising: the establishment of a functional forest management institution in each participating community; surveys, mapping and the development of a management plan for each designated area; and multi-year tree planting and protection activities. The investment cost is estimated at USD 585/ha.

71. **Chosso 1.5.2 Community woodlots (E ~ 5.0%).** Woodlots have been created in The Gambia since the 1980s as important sources of fuelwood, timber, grazing land, wind breaks and improved soil nutrients, *inter alia*. PIWAMP established an estimated 119 ha of community-managed woodlot between 2007-10 and the activity continued under the follow-on Sustainable Land Management Project. The key lesson learned from this experience has been the necessity for strong local management of the establishment and operation of woodlots, driven by the communities’ observation and understanding of real benefits in addressing natural resource degradation and increasing community wealth, with the involvement and assistance of external organizations being wholly in response to demand.

72. In line with requests emanating from watershed management plans, the project would establish 75 ha of community woodlots based on the approach and methodology of the well-established programme of the Forestry Department. The estimated budget to establish a 1 ha woodlot is USD 3,300, including USD 2,000 for the essential security fence.

73. The model emphasises the financial and environmental sustainability of each woodlot, founded on sound management by the communities themselves. The project would target initiatives in locations where the natural environment is under greater stress and vulnerable to additional challenges from a deteriorating climate. The need for additional income from such activities is most pressing for communities with increasing population pressures on finite natural resources, in particular in North Bank, CRR South and CRR North.

74. Interested parties would be assisted in devising a robust plan for both implementation and the future operation and maintenance of each woodlot. Successful woodlots have focused on timber production rather than fuelwood or other purposes. Best practice now avoids reliance on a single species in a stand of trees, in line with the drive for biodiversity and a measure of insurance against unforeseen hazards as temperatures increase. The selection of suitable varieties should be driven by the quality required for the proposed use of the output and careful observation of which trees are thriving in the immediate area.

75. Whilst *Chosso* can support the establishment of woodlots with financial resources and technical advice, strong community ownership and commitment have been shown repeatedly to be the key

ingredients in successful initiatives, including a full part played by women in both management and operations.

76. **Chosso 1.5.3 Mangrove restoration (E ~ 24.2%).** Mangroves are of vital importance to the biodiversity of the country's natural environment. Mangrove forests are aqua-plant communities that are part of a larger ecosystem that typically includes mudflats, tidal marshes, salt barrens, coastal forests and freshwater wetlands, freshwater streams and rivers. They are critical habitats for many species of fish and wildlife, serving as fish and shellfish nurseries and producing large quantities of leaf material that becomes the basis for a detritus food web. Once established, they can serve as sources of livelihood for the riverine communities, provide physical protection from storms and floods, and help to remove pollutants before they enter adjacent coastal waters.

77. Mangroves have been massively depleted in living memory by a combination of natural “die-back” (linked in some cases to hyper-salinity) and excessive exploitation and clearance for unsustainable rice production and fuelwood. The indicated remedies are, at a scale commensurate with the problem: to widen the mangrove belt; to replant mangroves in the context of a community resource management plan; and to ensure that infrastructure built along the mangrove belt and upstream on tributaries pays due regard to the tidal flow requirements of the mangrove ecosystems.

Box 2: The use and abuse of a fragile ecosystem; a forty-year view.

The field visit of the final design team to an ongoing mangrove restoration project at Bondali Tenda happened to coincide with the brief return of a man who grew up in that place but left in 1975. With a forty-year perspective, he was deeply shocked by what he saw: the dereliction of the foreshore, the lack of tall dense mangrove and mature trees, and the relics of the long-gone groundnut production including the remains of the jetty from which the produce had been loaded onto river boats. He recalled vividly the crocodiles preventing children from swimming in the river and the presence of large wild animals in the forest, which extended to the high tide mark. He was in little doubt that most of the cumulative destruction should be attributed to unwitting human agency.

Source: Chosso final design mission field visit to Bondali Tenda, 26 April 2015.



Bondali Tenda circa 1975



Bondali Tenda 2015

78. In parallel with the two community-driven tree planting programmes, *Chosso* would promote mangrove restoration as both a productive resource and an important element in river management. Healthy mangroves are key to the saline-fresh water balance in the complex River Gambia system, important habitats for wildlife and a significant contributor to livelihoods.

79. The project would undertake 600 ha of systematic replanting and consolidation of mangroves in the lower reaches of the River Gambia (WCR, LRR and NBR), particularly in areas adjacent to lowland water control structures installed by *Nema* and/or to complement other ongoing projects. The estimated cost is USD 2,600/ha. *Chosso* would work with and through interested communities along the bank for whom fishing is a major source of income.

80. The mangrove restoration technology is well-understood from the iterative experience gained by recent pilot schemes led by the Forestry Department, in which the local fishermen have been highly motivated by evidence of the rapid reestablishment of oysters in the newly planted mangrove, the replenishment of fish stocks in the immediate vicinity, and even the return of crocodiles after years of absence. Committed communities have been prepared to deal with minor conflicts with other river users, such as livestock keepers, during implementation and to contribute labour as a significant proportion of the overall cost in kind.

81. In addition to contributing to flood protection and livelihoods, mangrove restoration generates several valuable ecological benefits, including carbon sequestration, nutrient retention, sediment retention, biodiversity habitat, flood attenuation, wastewater treatment, water supply and recharge.

Component 2: Agricultural commercialization

2.1 Producer Organizations subcomponent.

82. ***Chosso* 2.1.1 Climate resilience for producers (E ~ 1.4%).** The project would seek to extend “best practice” to smallholders in response to increased climate variability and change, both on-farm and in the sustainable use of natural resources within the watershed. The practices to be promoted would include: the selection of varieties that are drought, salt or flood tolerant based on the location; integrated pest management linked to temperature increases and the promotion of organic manure; ensuring the sustainable use of inorganic fertilizers; crop rotation and diversification; the use of half-moons; and planting in basins or mulching.

83. An appropriate production adaptation curriculum and tools package would be developed with the extension services and MoECCWPW technical staff with expertise in climate change adaptation options. The climate change adaptation knowledge and skills would be conveyed to 1,200 farmers through the tried and tested *Nema* Farmer Field School channel or innovation platforms, so that producer organizations can have better access to, and make informed decisions about, climate change risk vis-à-vis their farming activities. The Functional Literacy Programme would be used to provide an effective forum for climate and weather messages tailored to the needs of farming households.

2.3 Technical support services subcomponent.

84. ***Chosso* 2.3.1 Capacity building of technical service providers (M ~ 1.6%).** The project would respond to the perceived weakness of the local works contracting sector by offering generic commercial and managerial advice through two technical workshops, and by providing mobilisation and implementation support for up to 30 successful bidders for the

civil works. This action will reinforce a major existing *Nema* intervention and make service providers more efficient, thereby ensuring contract completion as well as greater climate proofing of infrastructure through the enhanced standards and materials. The programme will target emergent Gambian private sector service providers, particularly local contractors on aspects of management and contract execution.

85. **Chosso 2.3.2 Climate risk information services (E ~ 1.5%).** Farmers depend on a variety of sources for weather information, including radios and community networks, but pertinent information is often received too late to inform planting decisions. They need reliable advice on likely start and end dates for the rains as well as seasonal forecasts. This information is provided by the Department of Meteorological Services (DMS), which undertakes analysis at a central level. Regional- and district-level monitoring and forecasting capacity is negligible. Data collection at the local level is also limited and interaction between the providers and end-users of the information is non-existent.

86. *Chosso* would consolidate the timely generation and dissemination of key weather and climate risk information to smallholders at the local level in an appropriate user-friendly format. The project would finance the strengthening of a GIS-based information gathering, analysis, forecasting and dissemination system in the Climate Services Division of the Department of Water Resources (DWR). At the centre, the upgrading and operation of the GIS Unit in DWR would be supported with sufficiently powerful computer hardware and software for climate modelling, with appropriate technical training in its use.

87. Extension workers would be trained in the basic collection and analysis of data and be engaged in devising the most appropriate packaging and dissemination methodologies. The field staff would be equipped with the relevant tools for the dissemination of the information to about 100 communities over the life of the project. Methods such as the use of mobile phones and radio listening groups would be explored. *Chosso's* engagement with the farmers as end-users of the information and the agricultural extension staff to develop the package of climate information according to needs will be a further step in developing a national framework on climate services (using the guidelines of the Global Framework on Climate Services).

88. **Chosso 2.3.3 Hydrological information services (E ~ 4.0%).** In parallel with the initiatives on climate change modelling and weather forecasting services for smallholders, *Chosso* would support hydrological data collection, analysis and modelling in the public sector to inform the mainstreaming of climate change adaptation within the country. This activity would contribute to the recently-developed national hydrological monitoring network.⁷ Technicians would concentrate on the observed and predicted changes in the behaviour of the River Gambia and its watershed both within and beyond national boundaries, particularly in the context of the demand for irrigation water from the river and its tributaries.

89. The salinization of formerly productive fields and the advance of the saline front present several challenges for smallholders. This activity will be aimed at understanding the interactions and impacts of the changing climate on the hydrological system including the water and salinization control measures such as dikes that are being constructed. The results will inform the design of tidal irrigation schemes and other lowland developments.

⁷ Phase two of the Climate Change Service Strengthening and Early Warning Project was launched in early May 2015 with funding from UNEP, GEF and UNDP. It will install salinity monitoring boreholes and river flow facilities at strategic locations along the River Gambia.

90. Hydrometric equipment would be provided for the Hydrology Unit to complement the institutional support from other projects so that they can perform effectively real-time monitoring, including quantitative and qualitative measuring gauges at strategic locations along The River Gambia and its tributaries. Technicians would be trained in the use of the equipment and analysis of the expanded database. The aim is a fully-functioning hydrological information service within the country to make key information for the development of the water available to users.

Component 3: Project Facilitation

3.1 Project management and implementation support subcomponent.

91. **Chosso 3.1.1 Climate change management capacity (E ~ 7.1%).** The project support and management capacity of *Nema* would be strengthened with the addition of two full-time specialists, a Climate Change Adaptation Officer (CCAO) and a Climate Change Adaptation Assistant (CCAA), as “champions” of the *Chosso* campaign for climate change adaptation in the country. Working from the established PSU, the additional staff would have appropriate mobility support, computing and communications facilities, and access to technical skills development courses.

92. Specialist international technical assistance would be made available as required to support management with the mainstreaming of climate change adaptation into *Nema* implementation and the public service. Some of the initially-identified needs for the TA include the GIS analytical capacity and the development of both the National Framework on Climate Services and products targeted at smallholder farmers.

3.2 Knowledge management, monitoring & evaluation subcomponent.

93. **Chosso 3.2.1 Resilience research and climate policy dialogue (E ~ 9.4%).** *Nema*’s robust PME framework would be enhanced with respect to the mainstreaming of climate change adaptation with the conduct of a supplementary baseline survey, concentrated impact surveys and the adoption of IFAD’s standard Social, Environmental & Climate Assessment Procedures (SECAP). The application of the SECAP will entail an update of the Environment & Social Management Plan developed for *Nema* and enhanced monitoring of natural resource management using tools such as GIS as well as capitalizing on *Nema*’s emerging experience of the use of Earth Observation through the Gambia Earth Observation Network.

94. Research will be conducted into the specific predicted impact of climate change on the Gambian rural population to inform policy and the most cost-effective adaptation responses whilst leveraging existing processes to enhance policy dialogue with a focus on mainstreaming the livelihood resilience options of the smallholder. About eight knowledge products will be developed under the *Chosso* on topics such as technical comparison studies for the modified infrastructure, community based adaptation techniques, the development of manuals for watershed management, enhanced standards for infrastructure design, and the mangrove restoration interface with salinity and dike design and installation.

95. The manuals and enhanced infrastructure design standards to be produced will also influence related sectoral policies. Other policy level interventions and dialogue opportunities will be identified for climate change mainstreaming, including the conduct of ten inclusive national climate change response events and purposeful regional networking to learn from the experience of countries facing similar challenges. *Chosso* will support the effective operation of the National Climate Committee through the establishment of a functional

secretariat and streamlining of the core membership, including its roles and responsibilities under the umbrella of the Agriculture and Natural Resources Working Group. The Government is in the process of drafting a National Adaption Plan together with implementation framework with the support of key donors. As coordination is likely to remain with NCC or a revised structure, *Chosso* will support the formulation process particularly by facilitating the participation and active involvement of smallholder farmers and their organizations to ensure that their specific issues are fully captured in plans. In addition and as appropriately determined, *Chosso* will contribute resources (both technical through contracted TA and financial) to support the finalisation and implementation of these plans with a special focus on smallholder adaptation issues.

96. *Chosso* would assist the Directorate of Development Planning of MoFEA with the development of effective approaches and methodologies for planning and budgeting for climate change adaptation throughout government service and the wider economy. This will be extremely important as GoTG plans to develop a national development strategy from 2016 for which purpose the PSU will be collaborating closely with NCC and other key platforms to ensure that smallholder resilience issues are adequately reflected.

97. The project will also support the development of the Global Framework for Climate Services (GFCS), which adds the energy and transport sectors to the four priority sectors of agriculture and food security, water, health and disaster risk management according to the guidelines of the WMO. The Framework is an essential step that precedes the development of climate service packages for the smallholder farmers that *Chosso* will finance along with the required dissemination. It will have a strong emphasis on user involvement in the formulation of packages for climate services and capacity development as well as the engagement of all partners to maximise benefits for all users. The GFCS is aimed at reducing the vulnerability of society to climate-related hazards and advancing the key global development goals through better provision of climate information services.

D. Lessons learned and adherence to IFAD policies

98. **Country performance.** The overall performance of the portfolio has improved and stabilised over the years as evidenced by the 2012 and 2014 client surveys with an overall record of satisfactory performance across all the key indicators on aid effectiveness (country ownership, harmonization and alignment), household impact (in terms of food security, income and empowerment), effective partnership, policy influence (national policy dialogue and participation in policy discussion), and Environment & Climate Change. A review of IFAD's Country Programme Approach (CPA) concluded that this arrangement has not only strengthened coordination, capacity building and enhanced policy dialogue at all levels but also deepened learning and sharing among IFAD-financed projects and with non-IFAD-financed projects.

99. However, country performance has been impacted severely by the recent delayed and shortened rainfall patterns, which reduced 2014 crop production by an estimated 20-40%, coupled with the Ebola epidemic which resulted in a substantial decrease in labour mobility and tourism. In 2011, the country had crop failure due to drought in the Sahel, where many countries declared humanitarian and food crises. The recurrences of drought, flood, and pest and disease infestations are clear manifestations of the impact of extreme climate events that overstretch the coping mechanisms of rural households.

100. Since 1982, IFAD has financed ten projects and programmes with a total investment amounting to USD 73.9 million in loans and grants. Of these, eight have been closed, the most recent being the Rural Finance Project (RFP) and Participatory Integrated Watershed Management Project (PIWAMP) on 31 December 2014. While most of IFAD's intervention have focused on natural resource and environmental management, a number have both directly and indirectly capacitated rural communities and poor households to cope with The Gambia's unique climate and agro-ecological conditions, thereby assuring household livelihood security.

101. The Project Completion Reports of RFP and PIWAMP asserted that the interventions had high relevance to their target communities and were effective in reaching beneficiaries but efficiency and sustainability remained key issues to be addressed. In the case of PIWAMP, the financial and economic rates of returns amply justified IFAD's investment, being higher at completion than estimated at design (FIRR 24% and EIRR 19%) at 27% and 21% respectively. The notable PIWAMP interventions were the construction of dikes and spillways, causeways and bridges, inter-village roads, contour bunds, gully plugs and the establishment of community woodlots and forest enrichment, among others. These infrastructures have enabled the crop (paddy rice, maize, sorghum, millet and groundnut) cultivation of 49,751 ha, far exceeding the appraisal target of 17,143 ha. However, whilst total crop production increased from 4,504 mt in 2006 to 50,481 mt in 2013, crop yields generally stagnated and even decreased in some years.

102. **Lessons learned.** A number of lessons have been learnt from projects dealing with climate change in the country (UNDP, UNEP, NEA, MoECCWPW) and the Region (GEF-, LDCF-, SCCF- and AF-funded projects) and complement those lessons that fed into the design of *Nema* and are emerging from implementation, including the following, (see Appendix 3).

- Smallholder farmers and communities have some experience in dealing with climate change and their local knowledge should be capitalized upon when introducing measures to strengthen their resilience.
- Target beneficiaries should be properly sensitized and undergo specific climate change adaptation capacity building prior to involvement in participatory decision making and planning processes with a focus on climate change adaptation.
- Championship of climate change through key institutions in planning and programming engenders its mainstreaming into policy and programming. The placement of the Focal Point of the Green Climate Fund in the Directorate of Budget at the MoFEA is facilitating the mainstreaming of climate change in policy and the programming of key sectors of the economy.
- Access to timely early warning information by stakeholders, particularly farmers, enables them to take rational decisions including optimal choices of crop enterprises and varieties. In this regard, proper packaging is key to its understanding and utilization, particularly by communities with a high incidence of illiteracy.
- Providing users of shared natural resources with alternative livelihoods eases pressure on the fragile environment as well as building their resilience to climate change. In this regard, a number of projects are promoting off-farm and non-

agricultural income generating activities such as vegetable gardening, oyster culture and honey production.

- Involvement of communities in participatory processes, including decision making on resource utilization and benefit sharing ensures their sustainable utilization and maintenance. In the case of Community Forestry Management, communities assume eventual ownership and retention of revenues from the resources, and this has ensured protection of the resources from logging and bushfires.
- A watershed approach is the most optimal approach addressing the complexity of the many cause-and-effect relationships between upland and lowlands vis-à-vis the hydrological dynamics of the River Gambia.
- Support to gender-sensitive community development plans coupled with participatory mapping enhances beneficiaries' real sense of ownership of development outcome processes.
- Simple and low cost irrigation technologies are more sustainable as operation and maintenance costs are affordable to beneficiaries.
- Well-organized small-scale farmers are capable of managing irrigation schemes if they have access to improved seeds and credits as well as capacity building.
- Establishment of Farmers' Field Schools is proving to be an effective means to test and validate innovations before farmers are convinced to adopt changes.
- There are water resources that could be mobilized through appropriate and cost-effective irrigation technologies (tidal and solar pump) for year-round crop production.
- Tidal irrigation has a profit-cost ratio of 2.02 compared to 0.72 for pump irrigation.⁸
- For every 1 m³ of water pumped from the Upper River of the River Gambia during the dry season, the salt front can move four km upstream.
- Strengthening and using existing implementing institutional units is more cost effective and becomes a leveraging factor for donors with a view to avoiding duplications of efforts whilst maximising the use of scarce resources.

103. These lessons have informed the design of the *Chosso* through the approach taken and activities included such as the sensitisation of the communities, capacity building in irrigation water management, strengthening participatory watershed management, agroforestry, and improving the timely dissemination of weather and climate information.

104. **Adherence to IFAD policies.** As with *Nema*, the *Chosso* design is aligned to all relevant IFAD strategies and policies, including: Strategic Framework 2011-15; Targeting Policy – Reaching the Poor; Gender Strategy; Climate Change Strategy; Environment and Natural Resource Management Policy; Policy on Supervision and Implementation Support; and the recent Social Environmental and Climate Assessment Procedures (SECAP).

105. The 2011 *Environment and Natural Resource Management Policy: Resilient livelihoods through the sustainable use of natural assets* has particular significance for the project. The policy distils lessons learnt in previous IFAD initiatives that have sought to reduce rural poverty through interventions related to the environment. The ten principles of

⁸ http://www.fao.org/nr/water/aquastat/countries_regions/gmb/index.stm.

the IFAD *ENRM Policy* encapsulate both the core issues to be addressed and suggested approaches.

106. *Chosso* is fully aligned to the *Climate Change Strategy* goal of maximising IFAD's impact on rural poverty in a changing climate and precisely relevant to two COSOP statements of purpose: to support innovative approaches to helping smallholder farmers build their resilience to climate; and to inform a more coherent dialogue on climate change, rural development, agriculture and food security.

III. Project implementation

A. Approach

107. **Approach to project implementation.** It is important to consider climate change risks in the context of this project and to increase the adaptive capacity of beneficiaries, partners and stakeholders. *Chosso* like *Nema* will be driven by community priorities included in action plans being developed on a rolling basis following community sensitization. Thus, target beneficiaries for specific interventions cannot be predetermined.

108. However, an additional set of studies and data sets will inform further the targeting of *Chosso* interventions among *Nema* beneficiaries. A baseline study will be undertaken to assess the level of climate change vulnerability of the target communities, if not already done by earlier projects. The assessment will build on existing regional and national vulnerability studies.

109. The adaptive capacity of communities is dependent on their livelihood assets including the natural resource base. *Chosso* will complement vulnerability assessments with maps and GIS data sources to identify the degraded hotspots within watersheds. Specific criteria will be developed for the piloting of infrastructure modifications and the installation of water harvesting structures, incorporating both feasibility and cost effectiveness. The phasing and sequencing of the specific interventions based on the action plans developed will be important to ensure synergies between the components. The phasing will enable learning and the refinement of the adaptation approaches being promoted.

110. Building the capacities of project staff (particularly the *Nema* Gender Focal Point) and project partners at the outset (for example, district officials) would be essential with some tailored, context-relevant and engaging training on the gender dimensions of poverty, development planning and budgeting, and results. The use of household methodologies, already being practiced in the country, will be further explored during *Chosso* implementation. Capacity building of the target communities will be a continuous process through already established *fora* such as the FFS and FLP.

111. The legal provisions and policy pronouncements on women's equitable access to land have been operational in theory since 2010 but are still to be implemented fully because of social and cultural barriers that are rooted in the 'power relations' *status quo*. Access to land for vegetable production is essential if women are to invest in their business as already initiated by *Nema* and built on LHDP's experience. Also, based on the community best practice on accessing land for forestry activities, *Chosso* will collaborate with national and regional structures to advocate and support the formalization of community land tenure for activities related to both water harvesting and forest restitution. Careful handling of this issue with women's groups and capacity development of *Nema* staff should be undertaken by and

through the gender structures in GoTG but also capitalizing on local and traditional structures to support advocacy.

112. **Project duration and phasing.** *Chosso* would be implemented over four years (2016 to 2019 inclusive) in full synchronisation with *Nema*'s remaining years of implementation.

B. Organizational framework

113. **Implementing arrangements.** The management of *Chosso* will be mainstreamed into the PSU of *Nema* charged with its day-to-day implementation. *Chosso* will be jointly executed MoA and Ministry of Environment, Climate Change, Water, Parks and Wildlife (MoECCWPW) in order to ensure greater synergies and complementarities. However, as for other projects under MoA, the overall coordination of *Nema* will continue to be provided by the Central Projects Coordination Unit (CPCU). *Nema*'s strategy of implementation through service providers, including those under the MoECCWPW and coordination by Regional Agricultural Directorates (RADs), will continue.

114. The project is building functional linkages between institutions to improve access to available climate risk information and know-how/technologies that are relevant to mitigating environmental and climatic risks in agricultural systems.

115. **Project Steering Committee.** The current Project Steering Committee (PSC), for *Nema*, charged with policy guidance including review and approval of implementation progress and annual work plans and budgets including procurement plans, will be maintained and expanded to include two additional members: the National Focal Point for Climate Change at the Department of Water Resources (DWR) of MoECCWPW; and the Green Climate Fund Focal Point at the Directorate of Budget in the Ministry of Finance and Economic Affairs. *Chosso* PSC meetings or consultations will be co-chaired by MoA and MoECCWPW and these additions to the PSC will strengthen the mainstreaming of climate change in the implementation of *Nema*.

116. **Project Support Unit.** The PSU will continue to be lean but will be expanded to include a Climate Change Adaptation Officer (CCAO) and a Climate Change Adaptation Assistant (CCAA) who will spearhead the mainstreaming of climate change adaptation in *Nema*. A further assessment of the PSU capacity and skill mix will be undertaken to determine whether additional technical support would be required taking into account the additional staff to be recruited with IsDB and AfDB funds. MoA and MoECCWPW, through CPCU, will facilitate and coordinate the transparent, open and competitive recruitment of the CCAO and CCAA in close consultation with IFAD.

117. **Central Project Coordination Unit.** As is the case for other projects, the CPCU will continue its overall coordination of the *Nema*, which fully embeds *Chosso*. The Unit will, however, liaise closely with MoECCWPW on *Chosso*-specific issues on climate change. *Chosso* will be integrated into the Gambia National Agricultural Database housed at the Planning Services Unit of MoA as well as to MoECCWPW's existing monitoring frameworks.

118. **Implementing agencies and producer groups.** The *Chosso* will adopt the *Nema* approach of implementation through qualified and competent service providers from both the public and private sectors. Service providers will enter into performance contracts with the project with supervision and monitoring by local communities/beneficiaries.

119. **Strategic partnerships.** The collaborative *Chosso* design seeks partnerships with other UN agencies and sources of climate and environmental finance and linkages with

other adaptation-related projects and national disaster risk management initiatives. The partnerships aim to maximise synergies and avoid duplication of efforts. The PSU will ensure greater collaboration during implementation with UN agencies and other key partners in order to maximise rural household resilient impact in the country.

C. Planning, M&E, learning and knowledge management

120. In addition to the augmentation of the comprehensive *Nema* M&E and KM framework with appropriate RIMS and adaptation-related indicators, the project will develop a learning agenda to assess specific questions related to smallholder adaptation and resilience, consider mechanisms of international knowledge sharing with the ASAP portfolio in IFAD and associated knowledge networks, and develop thematic evidence-based studies and publications on specific topics.

121. Four of the 13 proposed indicators for *Chosso* are impact-focused, related to savings in the burden of illness and drudgery for women (which erodes their human capital, productive potential and adaptive capacity); and provisioning benefits from mangrove and upland trees planted and from rainfall harvesting infrastructure for low rainfall years (which would be expected to add to food security and income which increases vulnerable groups' adaptive capacity). Health impacts in rice growing areas in particular should be monitored to determine changes in the burden of illness among women, which can help to define better the adaptation response. This could be a particular issue in tidal irrigation areas that already have high incidences of vector borne diseases such as malaria, given their sensitivity to changes in rainfall patterns and to night and day temperature increases.

122. The other nine indicators are intermediate measures of changes in environmental and infrastructural conditions as well as knowledge expansion, which are expected to lead to changes in adaptive capacity status. Results will be useful for GoTG in developing understanding of the types of investments that are cost effective in achieving adaptation, resilience to climate shocks and raising levels of adaptive capacity. Baseline initiatives such as mangrove rehabilitation investment funded by the GEF Sustainable Land Management Project (SLMP) seem to be making a difference to people's livelihoods, based on limited interviews with community members, but quantitative data on provisioning benefits and livelihood impacts are not being collected. This supplementary ASAP project will correct this weakness and demonstrate the utility of data for evidence-based policy dialogue.

123. Given the limited ASAP funds, adaptation interventions in relation to water control infrastructure will need to be made for a subset of the total investment. This provides IFAD with an opportunity to fit an experimental evaluation design around the adapted and unadapted structures to assess the sustainability and cost effectiveness of the additional adaptation investments. Results would be useful to GoTG in the development of infrastructure standards as well as to IFAD to inform its adaptation and programming strategies.

Planning

124. *Chosso* will adopt planning as the first stage of intervention as is currently practiced by *Nema* in the *Bantaba* Watershed Planning. Climate change risk assessment and identification of adaptation responses are to be integrated into the PRA methodology as an input into the village action plans and the *bantaba* planning exercises. As indicated above, sensitisations on climate change will precede watershed/adaptation planning exercises. User groups will be strengthened to manage common resources, which will become

increasingly important as climate change impacts cause additional stress in further degrading common resources.

125. The project will continue working through women and youth structures, which have established relationships and ways of working with their constituencies, especially given the sensitivities around land tenure.

Monitoring and evaluation

126. The *Chosso* M&E will be integrated fully into the *Nema* M&E framework, which is linked to the GANAD. The PSU will ensure *Chosso* specific indicators are reflected appropriately in the overall Agricultural Sector M&E system and respond and contribute directly to the sectoral results framework of MoECCWPW. Pertinent RIMS and ASAP indicators will be monitored and reported alongside those already collected by the project. The *Nema* integrated system of Planning, Monitoring and Evaluation (PME)/Integrated Knowledge Management and Communication (IKMC) will be reinforced to provide: (a) timely and accurate information on implementation progress and constant feedback for decision making and addressing potential plan deviations and problems during implementation; (b) the basis for assessing the achievement of project results; and (c) a platform for continuous knowledge sharing and learning activities.

Learning and knowledge management

127. The project will build regional knowledge networks (learning routes) and feed project-related knowledge into national, international, UN and IFAD knowledge networks on climate change. The project has made provision to generate, document and disseminate knowledge products and best practices that would contribute to national policy process and dialogues. The project will also complement ongoing planned studies to be undertaken in The Gambia through the Platform for Agricultural Risk Management and capitalize on lessons learned to feed into the broader smallholder risk management processes in the country taking into account the country's recent enrolment in the Africa Risk Capacity initiative.

128. Moreover, *Chosso* will leverage the emerging lessons and best practices from the implementation of IFAD's grant on the voluntary guidelines on land tenure and forestry governance with the close collaboration of the national farmers' organizations. With respect to youth, the approaches being implemented under Creating Opportunities for Rural Youth (CORY) grant programme will be leveraged to ensure the broader participation and involvement of rural young women and men in *Chosso* interventions as already being done for both *Nema* and LHDP.

D. Financial management, procurement and governance

129. **Methodology.** In accordance with IFAD guidelines, a Financial Management Assessment (FMA) has been undertaken as part of project detailed design taking into account *Nema*'s financial management performance. The objective of the FMA is to provide further assurances that the project will be implemented in an environment with sufficiently strong financial management systems and controls in place to manage properly, control and report on project finances.

130. **Project risk.** The proposed ASAP financing will take advantage of the *Nema* PSU and its FM arrangements already in place, which have been rated moderately satisfactory and assessed currently as medium risk. Given proper implementation of mitigation actions, the risk is expected to decrease to low.

131. **Proposed financial management arrangements.** The proposed FM arrangements will follow those already in place in the *Nema* PSU with some adjustments concerning the Financial Procedures Manual, financial reporting and accounting software.

132. **Staffing.** The Financial Management unit of the *Nema* PSU, consisting of a Financial Controller, an Accountant and an Accounts Clerk, reports to the Project Director (PD). The positions of the Financial Controller and the Accountant have been filled recently through a competitive recruitment process overseen by the Personnel Management Office in collaboration with MoA. Given that ASAP financing is additional to the IFAD financing and proposed enhancement in the accounting software, no extra staff will be required and thus the current Accounts Clerk for the IFAD financing will be covering the ASAP financing.

133. **Budgeting and Budget control.** The *Nema* PSU will prepare a consolidated *Nema-Chosso* Annual Work Plan & Budget (AWPB) in a format acceptable to IFAD and submit it to the PSC for approval and to IFAD for its Non-Objection at least two months before the beginning of the relevant fiscal year.

134. **Accounting.** The *Nema* PSU will maintain its accounting records in accordance with the IPSAS cash basis for accounting. The project transactions will be recorded in the accounting software (FinEx). The accounting software will need to be reconfigured further to i) accommodate the ASAP financing, ii) generate automatically all necessary financial reports, and iii) extend withdrawal application forms including extended statements of expenditure (SoEs) disclosing the complete audit trail for each expenditure item, (including budget line, payee, accounting ID, contract/invoice number and payment).

135. **Flow of funds.** The flow of funds will follow the practice already in place for *Nema*. Accordingly, the Government will open and maintain a Designated Account (DA) denominated in US Dollars at the Central Bank for the ASAP grant.

136. **Conditions for first withdrawal.** As per IFAD's assessment, the following conditions related to financial management are to be met before the first withdrawal under the ASAP grant can be realized:

- IFAD has received from the Minister of Finance and Economic Affairs, a letter designating the name(s) of official(s) authorized to sign withdrawal applications, which includes their authenticated specimen signature(s);
- IFAD has received documentation evidencing the opening of the bank accounts designated to receive the financing with advice of the persons/titles authorized to operate these accounts;
- an updated Project Implementation Manual including the Financial Procedures Manual has been approved by IFAD;
- key project staff including key financial staff has been duly appointed;
- the accounting software has been reconfigured as agreed with IFAD; and
- the first Annual Work Plan and Budget (AWPB) has been approved by IFAD.

137. **IFAD disbursement procedures.** The ASAP financing shall be disbursed against duly certified withdrawal applications in accordance with the IFAD disbursement procedures. The Designated Accounts for the ASAP financing will be operated and replenished following Imprest Account arrangements with an Authorized Allocation equal to the average

requirements of six months implementation. As per the ongoing arrangements, the GoTG contribution will continue to be deposited in a separate bank account.

138. Financial Reporting. The *Nema* PSU will provide IFAD with financial reports within agreed timeframes as follow.

- Quarterly/semi-annual consolidated Interim Financial Reports.
- Annual Financial Statements within four months after the end of the fiscal year.
- Annual consolidated audit report and a management letter within six months after the end of the Borrower's fiscal year.

139. External audit. The ASAP grant will be included in *Nema*'s annual audit exercise. Accordingly, the *Nema* PSU will contract independent auditors selected by the National Audit Office (NAO) as per national practice and in accordance with the procedures and criteria set forth in IFAD's Guidelines on Project Audits (for Borrower's Use) using Quality and Cost Based Selection (QCBS) as the method of procurement. The auditors will be required to audit the consolidated financial statements of the entire project for each fiscal year in accordance with International Standards on Auditing (ISA). The audit report, including the management letter covering the audit observations on internal controls, will be submitted to IFAD within six months of the end of the fiscal year.

140. Records management. In accordance with IFAD General Conditions, the Recipient has to maintain the original records for a minimum of ten years after project completion.

141. Supervision and implementation support. A financial management specialist will participate in annual IFAD supervision missions to supervise and provide implementation support to the project.

142. Procurement. MoA, through its Contract Committee and the CPCU would coordinate procurement functions for ASAP financing with the support of the PSU in line with the current Public Procurement Law. The Gambia has a history of practicing market- and competition-based techniques for contracting the supply of goods, works and public service delivery. The legislation contains significant provisions on probity and anti-corruption, including sanctions and penalties in the event of discovery.

143. All procurement by the project would be carried out under the supervision of the PSU's staff (including Supervising Engineers) who would be assisted by the MoA Procurement Officer. Tendering for most works and locally available goods would be carried out by Government staff. Other procurement subject to local shopping methods would be carried out by the PSU, with implementing agencies providing necessary technical specifications, bills of quantities and terms of reference. Bids would be evaluated by the MoA Contract Committee involving project staff. Under IFAD's new Procurement Guidelines (2010), the International Competitive Bidding would be mandatory for:

- goods equivalent to or above USD 200,000;
- civil works equivalent to or above USD 1.0 million; and
- services equivalent to or above USD 100,000.

144. Appropriate national procurement procedures in line with IFAD guidelines would be applicable for all types of procurement methods. However, the thresholds governing the procurement methods within the country, (national competitive bidding and local shopping),

set forth by the national policy have been found to be a considerable limiting factor in project execution in the past. Appropriate thresholds that can maximize the efficiency of the procurement implementation and reduce the governance risks will be specified in the PIM.

145. The project would contribute to building up the in-house procurement capacity of MoA, both instilling best practices and the required approach and methodology, and monitoring the timeliness and quality of the process. The effectiveness of procurement would need to be assessed during supervision and alternate arrangements put in place if necessary.

146. MoA is not maintaining a database of contractors that have been executing contracts within the ministry and projects under it. Due to the unavailability of a database of contractors, MoA does not have a list of contractors deemed underperforming or barred due to bad works and execution of contracts. It is recommended that the MoA should maintain such a database of contractors and a list of barred contractors who should be disqualified automatically if they bid for contracts.

147. The contracts committee under MoA has a delegated authority and is mandated to coordinate the procurement process of contracting goods and services below GMD 10 million. Contracts value from GMD 10 million and above are to go through the Major Tender Board under the Ministry of Finance & Economic Affairs. This new regulation is already in force but is likely to compound the ongoing procurement challenges that development projects are facing in the country.

E. Supervision

148. Supervision of *Chosso* will be integrated into *Nema*, which is being supervised biannually directly by IFAD. Supervision and implementation support would be based on IFAD's operational modalities and practices and would include grant and loan administration and project implementation support within the context of the IFAD's Country Programme Approach (CPA) arrangements. Such support would be a continuous process, involving ongoing communication and engagement with the Government, the *Nema* Project Support Unit and other relevant project stakeholders.

149. The required level of technical support and operational specificities related to ASAP will be discussed and validated at start-up. The first implementation support mission would take place soon after project effectiveness and first disbursement. IFAD would mobilise the appropriate climate change adaptation expertise (either externally or within IFAD) to join regular CPA supervision visits or provide a special focused mission to ensure that *Chosso* is implemented in the desired way.

150. *Chosso* regular progress reporting would also be integrated seamlessly into *Nema*'s reporting arrangements but will disaggregate clearly those activities and interventions funded separately with ASAP grant funds and those with IFAD financing to ensure that cost-effective activities are in line with design considerations, with the flexibility to review and refine but also contain any excessive incremental cost considerations taking into account unforeseen externalities that may have an impact on the achievement of project goals and objectives.

151. The key project features requiring special attention during supervision are: the rigorous and proper conduct of the climate awareness raising and watershed planning activities with strong modelling of climate over medium- to long-term time horizons; generation and timely dissemination of appropriate and targeted weather information to inform community decision making processes; the maintenance of flexibility in approach and modalities as the project

evolves, particularly with respect to the incremental cost effectiveness of tidal irrigation, water harvesting and lowland infrastructures and the profitability of market-oriented vegetable garden schemes with efficient water distribution systems; resilient capacity of households livelihoods in project intervention areas compared to non-*Chosso* households; and sustainability of built infrastructures in terms of durability and resilience to climate shocks as well as the capacity of beneficiaries to operate and finance post-investment asset maintenance and protection arrangements.

F. Risk identification and mitigation

152. The main risks have been identified under *Nema*. Additional risks under *Chosso* are as follow:

Risk	Initial risk	Risk mitigation measure	Final Risk
Community members are not willing to adopt proposed adaptation measures.	M	<ul style="list-style-type: none"> The sensitization of communities will be crucial and will initiate continuous engagement with follow up through the Farmer Field Schools and the Functional Literacy Programme. 	L
Limited technical capacity of staff in relevant agencies in relation to climate change adaptation.	M	<ul style="list-style-type: none"> The building of capacity through training of the MDFTs is a feature of the design. Capacity building is extended to service providers. 	L
Operational: capacity development services intermittent, supply-driven and therefore ineffective.	M	<ul style="list-style-type: none"> Design a strong, demand-led and continuous/multi-year programme of training with communities. The <i>Nema</i> Forum for Dialogue is providing a platform for discussing effective planning, sequencing, synergies and complementarities among the service providers. Establish performance-based contracts with community organisations to manage the community work, under overall guidance from Ministry of Agriculture. 	L
Operational: lack of community commitment to the project expressing itself ultimately as a lack of sustainability of the project measures.	M	<ul style="list-style-type: none"> <i>Chosso</i> will respond directly to beneficiaries' demands captured in their community action plans developed through the participatory communal/<i>bantaba</i> planning process. Exposure visits to communities that have benefited under PIWAMP/SLMP could help to change hearts and minds. The capacity development programme will build commitment. 	L

Risk	Initial risk	Risk mitigation measure	Final Risk
Operational: limited capacity of local service providers to provide high quality services in relation to the implementation of specific outputs.	H	<ul style="list-style-type: none"> The selection of service providers will be subject to rigorous selection processes and performance based contracting. Overall guidance and supervision will be provided by MoA in close collaboration with MoECCWPW. <i>Chosso</i> will provide adequate TA to ensure that best available knowledge is applied. 	M
Technical: proposed technologies or production practices may fail to protect against climate change-related impacts.	M	<ul style="list-style-type: none"> Design a process of participatory planning and implementation. Ensure that appropriate and targeted programme of capacity development is implemented. Monitoring of project indicators and proactive management follow-up as needed. Performance-based contracts. Clear ToR and competitive procurement procedures applied to secure best available and cost effective technology. 	L
Access to land and land tenure issues could limit the performance of the project (planting of mangroves and reforestation).	H	<ul style="list-style-type: none"> Ensure improved governance of natural assets for poor rural people by strengthening the land tenure and community led empowerment through <i>Nema</i>-supported advocacy drive and investments. Ensure the formalization of land use rights based on local norms. 	M

IV. Project costs, financing, benefits and sustainability

A. Project costs

153. The estimated total *Chosso* cost is USD 5.70 million of which the ASAP grant will cover 87.8% (USD 5.00 million) whilst both Government and Beneficiaries will contribute the remaining 12.2%. Costs have been derived from the data obtained during the design missions, each featuring a national multi-stakeholder validation workshop, technical discussions with GoTG and key partners, numerous consultations with target beneficiaries and other development partners and a review of unit costs of similar projects. The main assumptions underlying the cost derivations are as follow.

- *Inflation*. The domestic annual inflation rate is forecast at 4% and foreign inflation at 2.0% for the entire project period. Price contingencies reflecting these estimated inflation rates have been applied to all items.
- *Taxes and duties*. All domestic service and supply contracts, including those for civil works, are subject to a turnover tax of 2.5%. These taxes are computed to indicate the revenues foregone by GoTG, as project expenditure is exempted. Similarly, imports are subjected to duties that total 37% for most relevant categories, but the

applicable charges are waived for goods and services imported for direct use by the project.

- *Physical contingencies.* The assumptions underlying the expenditure accounts are summarised in Appendix 9 Table A9.2. Physical contingencies have been applied to Civil Works, Technical Assistance, and Salaries & Allowances (10%); and Vehicles, Equipment & Goods and other Operating Costs (5.0%).

Table 2: Chosso costs by Nema components and subcomponents

Components and subcomponents	GMD thousand	USD Thousand	% of base costs
Watershed development	185,952	3,719	75.1%
1.1 Communal watershed planning	11,050	221	4.5%
1.2 Water management for rice cultivation	82,465	1,649	33.3%
1.3 Village vegetable schemes	5,440	109	2.2%
1.4 Access roads and market infrastructure	0	0	0%
1.5 Community forest restitution	87,000	1,740	35.1%
Agricultural commercialization	20,950	419	8.5%
2.1 Producer organisations	3,500	70	1.4%
2.2 Value addition – rice and vegetables	0	0	0%
2.3 Technical support services	17,450	349	7.0%
Project facilitation	40,710	814	16.4%
3.1 Project management and implementation support	17,460	349	7.1%
3.2 Knowledge management, monitoring & evaluation	23,250	465	9.4%
Total base costs	247,612	4,952	100%
Physical Contingencies	19,609	392	7.9%
Price Contingencies	17,600	352	7.1%
Total project costs	284,821	5,696	115%

Note: arithmetic discrepancies due to rounding.

154. Total project costs are estimated at USD 5.70 million over a four-year implementation period and include USD 744,178 of physical and price contingencies, which account for 8% and 7% of total base costs, respectively. Foreign exchange accounts for about 27% of total project costs, mainly from civil works. Duties and taxes make up USD 202,925 (3.6%). Table 2 above summarises the project costs by components. Investment costs make up fully 99.0% of the total and recurrent costs the balance of 1.0%. By far the main expenditure category is Civil Works at 77.5% of the total.

B. Project financing

155. IFAD-ASAP resources available for financing the costs of the supplementary project amount to USD 5.0 million over four years from January 2016 to December 2019. The grant makes up 87.8% of total estimated project costs.

156. Grant funds would be complemented by the GoTG with about USD 224,453 comprising waived taxes (90.4%) and incremental staff salaries and operating expenses associated with the expanded *Nema-Chosso* Project Support Unit (9.6%).

157. Specifically, farmers, producer organisations and water user groups would mobilise resources for Drainage networks for new tidal irrigation schemes, Construction of pilot Trench and Earth dam water harvesting and Run-off catchment structures; Community agroforestry and Mangrove restoration; and Community woodlots. Overall contributions from

beneficiaries are estimated at 8.3% of the total project costs. The following Table 3 provides a summary of the proposed financing by project components.

Table 3: Financing plan by component (USD thousand)

	GoTG	IFAD (ASAP)	Benefic. contrib.	Total	% of total
Watershed development	109	3,780	472	4,361	76.6%
Agricultural commercialization	47	405	0	452	7.0%
Project facilitation	68	815	0	883	15.5%
Total costs	224	5,000	472	5,696	100%
Proportion of total cost	3.9%	87.8%	8.3%	100%	

C. Summary benefits and economic analysis

158. *Benefits.* Chosso is expected to generate benefits for present and future smallholders involved in agricultural production, including the *Nema* target group of rice and vegetable producers, as well as for domestic consumers and the country as a whole. Key quantifiable benefits would accrue from: additional dry season production of vegetables and small stock; incremental fish and oyster catches, and supplies of timber, fuelwood and non-forest products. The economic carrying capacity of the natural resource base would be enhanced by adaptation measures to improve both the quality and moisture content of soil and the management of surface water. The mainstreaming of climate proofing would reinforce the *Nema* drive towards financially and environmentally sustainable agriculture (see Tables A10.1 and A10.2 for details).

159. *Beneficiaries.* The number of primary beneficiaries targeted by Chosso asset creation interventions is estimated at 52,450 rural poor people/smallholders (6,556 rural households), comprising 5,500 beneficiaries already within the current scope of *Nema* and 46,950 new beneficiaries (5,869 rural households) to be targeted under the enhancement interventions. To this end, the cumulative total number primary households for the overall *Nema-Chosso* investment will be 28,729 households (22,860 for *Nema*, 80% and 5,869 as additional by Chosso, 20%).

160. As seen in Table A10.3 (page 120), the total number of primary beneficiaries targeted by Chosso through private and mainly communal asset creation interventions is estimated at 52,450 poor people (6,556 households). The 5,812 people targeted for “modification” activities are all included within the current scope of *Nema*, as are about half of the larger group of 46,950 people (5,869 households) engaged in the “enhancement” activities. In addition, resilience capacity building and adaptation knowledge management activities will target 35,612 people, many also involved in the above private and public investment activities. An estimated 352 intermediate beneficiaries (in groups and as individuals) will also benefit from capacity building and training activities intended to create the services needed to deliver project outcomes for the primary target group. A larger number of farming households will benefit indirectly from sector-wide/national climate change response activities promoting proactive adaptation management and reversing the deterioration of the natural resource base within watersheds.

161. *Financial analysis.* The financial analysis of the income-generating activities enabled by project investments in water capture and management infrastructure and forest restitution

has demonstrated modest but viable and sustainable returns to effort by communities within the watershed and beside the River Gambia.

162. *Economic analysis.* An economic analysis was undertaken to calculate the overall benefits of the supplementary Chosso project to The Gambia, based on a combination of direct benefits represented by incremental income and of indirect benefits flowing from investments in human, social and physical capital – predominantly individual and communal management skills and the productive potential of the restituted natural resource base.

163. With realistic and stringent assumptions, and concentrating on tangible and measurable benefits accruing from the “enhancements” to the scope of *Nema*, the net economic benefit stream to the country from *Chosso* has been derived over a 17-year period with project costs and benefits calculated in economic terms. The economic internal rate of return (EIRR) for the main four *Chosso* interventions is estimated at 18.1% under the base scenario, combining tangible benefits for rural producers with investments in the remediation and effective management of the communal natural resources upon which they depend. The NPV would be USD 1.20 million with a discount rate of 10%.

164. **Sensitivity analysis.** The economic returns to *Chosso* remain positive under various adverse scenarios: a 20% increase in total costs would reduce the EIRR to 13.8%, a 20% decrease in benefits to 12.9% and a two-year delay in benefits to 12.6%.

D. Sustainability

165. *Chosso* is focused on building systematic institutional linkages that will result in the improved (more climate risk aware) design of policies and investment programmes. The project is applying a balanced approach between environmental management, economic growth and the strengthening of social capital. Capital and sustainability will be manifested along the following dimensions.

- *Economic sustainability.* Infrastructural modifications will lower the risk that climate shocks (low/high rainfall years) will reduce the financial returns modelled for *Nema* over a 17-year time frame either through degradation of the infrastructure or because of saline water intrusion and limited rainfall affecting agricultural production yields.
- *Environmental sustainability.* Whereas *Nema* focuses on halting and reversing the deterioration in the state of the natural environment, *Chosso* will invest actively in sustainable land management, which will provide benefits to help livelihoods. Woodlots, a tried and tested management practice in The Gambia, will grow biomass energy in specific locations and so reduce the pressure on land thereby adding coherence to land rehabilitation efforts. Agroforestry can enhance *Nema* investments such as vegetable gardens and reduce maintenance requirements for bund stabilisation. Mangrove restoration offers multiple environmental benefits.
- *Institutional sustainability.* Data gathered on environmental and socio-economic benefits will inform government adaptation planning efforts. Working through the gender structures will strengthen them through planning and advocacy. Co-producing agricultural extension messaging linked to short-range and seasonal forecasting with farmers and creating communities of practice are other strategies for empowering women and youth likely to create robust, user-friendly and user-driven decision-support tools, methods and messaging.

- *Social sustainability:* Having a participatory planning approach led by the gender and youth structures in order to promote meaningful participation of the less empowered groups will lead to adaptation strategies that reflect the priorities of the target group. If the needs have been properly informed regarding time and resource requirements, trades-off, benefits and resilience effects, this process will lead to sustainable livelihood strategies for the target groups as well as empowering these groups to participate in their development more effectively.

Appendix 1: Country and rural context background

166. The Gambia has an estimated population of 1.88 million of which nearly half is rural and has greater incidence of poverty (2013 census). The national poverty rate was 48.4% in 2010, while the two predominantly rural regions Central River-North and Upper River had rates of 79% and 65.6% respectively, (Programme for Accelerated Growth and Employment – PAGE). Poverty is also more common when household heads are engaged in the agriculture and fishing sectors, which collectively employ almost 52% of the workforce.

167. National development and investment planning is guided by PAGE, the current medium-term programme (2012-15) under the Vision 2020 strategy. Implementation of the PAGE will be through the Priority Action Plans (PAP), which include one specifically on climate change. The Climate Change Priority Action Plan (CCPAP) identified twenty-four cross-sectoral activities/projects for the mainstreaming of climate change into the national development process, integration of climate change into education curricula from basic to higher education, and addressing climate data and information needs of the country. The CCPAP will also lead to the development of Low Emissions Carbon Development Strategy that will ensure a green economic development pathway.

168. Currently a Climate Change policy is being developed by a task force working under the National Climate Change Committee. The policy will build on several existing sectoral strategies and policies, and provide an enabling environment for the investments and innovations required to improve readiness to address climate change impacts.

169. The Gambia ranks as one of the countries highly vulnerable to climate change based on the GAIN index, ranking 163rd out of 180 countries, (or 16th most vulnerable). The food security vulnerability to climate change, which is measured in terms of food production, food demand, nutrition and rural population, is 177th out of 186 ranked countries. The indicators for the score include projected change of cereal yields, projected population growth, food import dependency, rural population, agriculture capacity and child malnutrition.

170. The main economic drivers in The Gambia are the services sector, accounting for approximately 58% of total output, followed by agriculture (30%) and industry (12%) respectively, (2nd National Communication). The potential contribution of the agricultural sector to Gross Domestic Product is limited by the rapid depletion of the natural resource base, the dependence on rainfed agriculture and the sensitivity and exposure to climate variability and change.

171. **Challenges.** The rapid depletion of the natural resource base is a result of increasing population pressure, extended periods of shifting cultivation, deforestation, recurrent droughts and increasing climate variability. Agricultural productivity is hindered by reduced water infiltration, high water run-off rates and the drying of inland valleys and river tributaries, which have been observed. Erosion and siltation of the Gambia River have reduced water flow and resulted in increased saltwater intrusion into the marginal lands. Siltation and sedimentation continue to threaten the viability and sustainability of lowland agriculture. These effects combined with periodic floods and epidemics place the country at risk to disasters.

172. The above listed challenges are among those to be addressed through the *Gambian National Agricultural Investment Plan* (GNAIP). The GNAIP is intended to increase the contribution of the Agriculture and Natural Resource sector to the national economy by

improving productivity through commercialisation and active private sector participation, based on a sound national macroeconomic framework aimed at enhanced growth and poverty reduction. Climate change adaptation and mitigation measures are key features of the GNAIP and mainstreamed throughout its five programmes. The measures include: developing irrigation; promoting the sustainable management of land, water and other natural resources; strengthening of early warning systems; and raising awareness, which will all build resilience of the population to the effects of climate change. One of the GNAIP's six objectives is:

“increased and sustained agricultural production and productivity growth by introducing improved agricultural practices through people-centred learning processes that enhance and conserve natural resources and the environment, help farmers to adapt to climate change, and increase household incomes”.

173. **Current climate.** The Gambia has a Sudano-Sahelian climate, characterised by a long dry season (November to May) and a short wet season (June to October). Average temperatures range from 18° to 30° C during the dry season and 23° to 33° C during the wet season. Mean annual temperature has increased noticeably since the 1940s. Mean annual rainfall varies from 900 mm in the south-west to about 500 mm in the northeast. Average relative humidity is about 68% in coastal areas and 41% in inland areas during the dry season and generally above 77% throughout the country during the wet season, (Agricultural National Appropriate Mitigation Actions).

174. According to the National Adaptation Programme of Action developed in 2007, the main climate hazards in The Gambia are: torrential rainfall, storms, drought, cold spells, intra-seasonal drought, heat waves and unseasonal rains. The last three are perceived as distinct evidence of the onset of a changing climate, which is characterised notably by increasing atmospheric CO₂ concentrations and sea level rise. Related hazards include a limited ability to predict the incidence of some hazards and the concomitance of multiple and mutually reinforcing hazards.

175. The mainstreaming of disaster into government policies and planning processes has become a priority for the Government of The Gambia. The National Disaster Management Agency (NDMA) has reviewed the three institutional frameworks (Disaster Act of 2008, and the Policy and Strategy Action Plan documents) to ensure harmony and full alignment to the Hyogo Framework of Action. The NDMA notes that the initial Act of 2008 and other documents fail to take on board fully the crucial issues of climate change adaptation, which need to be integrated into government policies, planning and strategies at all levels.

176. **Projected climate.** According to Gambia's 2nd Communication to the UNFCCC, temperature measurements since the 1940s reveal a rising trend in the order of 0.5°C/decade. The models agree that temperature increases will be significant with extremes in temperature becoming the norm and substantial increases in the number of hot days and nights by the 2090s, occurring more rapidly in the east of the country. The trend is consistent with the Intergovernmental Panel on Climate Change Assessment Report 5 (IPCC-AR5), which states that near surface temperatures over West Africa and the Sahel have increased over the last 50 years by 0.40° – 0.67° C per decade. In the AR5, temperatures in Africa are projected to rise faster than the global average increase during the 21st Century.

177. In tropical West Africa, these unprecedented climates are projected to occur one to two decades earlier than the global average because the relatively small natural climate

variability in this region generates narrow climate bounds that can be surpassed easily by relatively small climate changes. In West Africa an increase of 3-6° C is expected from the late 20th Century baseline mean annual temperature by end of 21st Century (AR5). Periods of high maximum and minimum temperatures are expected to increase and cold days and nights to decrease.

178. In terms of rainfall, the UN Convention on Climate Change (UNFCCC-99) projections indicate a change of 2% either side of the mean, whilst the other two Global Climate Models (GCMs) indicate changes ranging between -1% and -54%. Bureau of Meteorological Research Centre (BMRC-98) projections point to at least a 20% decrease in rainfall by mid-century. All GCMs project increasing rates of potential evapotranspiration within a range of 2% to 45%. In general, the BMRC-98 suggests a significantly larger increase in potential evapotranspiration rates. The models agree that rain will reduce in the wet season. The proportion of total annual rainfall that falls in heavy events is expected to decrease from January to June and to increase in July, August and September and in October, November and December.

179. Regional model studies included in the AR5 suggest an increase in the number of extreme rainfall days over West Africa and the Sahel during May and July with low to medium confidence. Dry periods of more than five days are expected to increase and breaks in rainfall of more than one week become frequent, as will droughts. Annual average total soil moisture is expected to continue to decrease due to increased evapotranspiration and reduced rainfall desiccate soil. Annual run-off will continue to increase, linked to storms and intense rain events. The wave regime is also expected to increase though the availability of wind predictions remains limited for West Africa.

180. Sea surface temperature is expected to increase with medium confidence that the mean of 2016-35 will be 0.3° to 0.7° C above the mean of 1986-2005. The AR5 includes increases in projected sea level rise over the next century, due to new research that improves understanding of global ice sheet movement and melting. The new projections show an increase of 0.26-0.55 metres by 2100 under a low emissions scenario and 0.52-0.98 metres under the high emissions scenario. CO₂ level in seawater is expected to increase from the present 350 ppm to 450 ppm or higher by 2100.

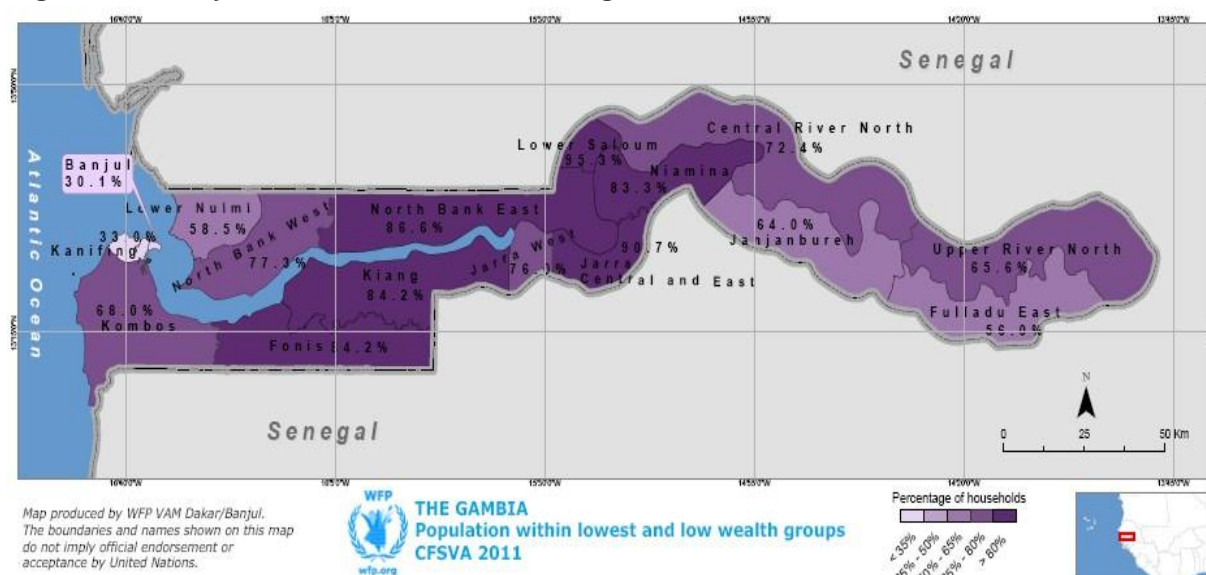
181. These climate-related stresses will magnify the effects on agriculture with impacts on the recharge of aquifers, soil erosion and sedimentation processes, changes in the amount of ground and surface water stored, and other disturbances to the hydrological cycle effects resulting in saline intrusion. Elevated atmospheric CO₂ concentrations are expected to increase crop yields, but higher temperatures and water shortages may act to counterbalance this beneficial effect. Recent experiments have shown that crop response to elevated CO₂ is relatively greater when water is a limiting factor. Well-fertilised crops respond more positively to CO₂ than less fertilised ones and thus the contrary is true for nitrogen.

182. The changes in temperature and rainfall will adversely affect natural resources such as forests and grasslands. Results obtained from the Holdridge Life Zone Classification model suggest that The Gambia's forest cover will fit more into a dry forest and tropical very dry forest categories. As the temperature becomes warmer, rainfall decreases and potential evapotranspiration increases, forest cover will be approximately subdivided into tropical very dry forest (35%-40%) and tropical dry forest (45%-60%), the warmer BMRC climate scenario having the highest percentage of tropical very dry forest.

Appendix 2: Poverty, targeting and gender

183. **Poverty and vulnerability context and drivers.** The Gambia has a GDP per capita of USD 512 (2012)⁹, and is classified as a Low Income Food Deficit Country, producing about 50% of total food consumption needs with the rest being met by commercial imports of rice and wheat flour coupled with food aid, (GNAIP 2011-2015). According to the World Bank database, the country has achieved the Millennium Development Goal (MDG) poverty reduction target at the poverty line of USD 1.25 but income inequality remains high in the country, especially in the rural areas, with high regional disparities based on a recent WFP assessment as shown in the map below.

Figure 2: Poverty distribution across the six regions



184. Of a population of around 1.88 million (2013 Census), about half is concentrated in rural areas, with 60% of the total population under 25 years of age. Poverty is largely a rural phenomenon with nearly half of rural households falling below the food poverty line, a significant proportion of these being female-headed, (GNAIP 2011-2015).

185. Gambia's Human Development Index value in 2012 was 0.439 in the Low Human Development category, positioning the country at 165 out of 187 countries and territories. The Gambia has a gender inequality index value of 0.594, ranking it at 128 out of 148 countries in the 2012 index but the nation made substantial progress in achieving the MDG related to gender parity in primary and secondary education. An estimated 60.4% of the population lived in multidimensional poverty while an additional 17.6% were vulnerable to multiple deprivations. The intensity of deprivation was 53.6%, indicating severe poverty. Development indices at this level are indicative of extremely low adaptive capacity, as measured by assets, income, health and educational status.

186. Gambia's rural communities are dependent upon the natural resource base and rainfall and therefore significantly vulnerable to climate change and worsening environmental conditions. Trend data shows that the Western end of the country is getting wetter, but with return periods for poor rainfall of between 6-10 years. The central and Eastern parts of the

⁹ <http://data.un.org/CountryProfile.aspx?crName=gambia>.

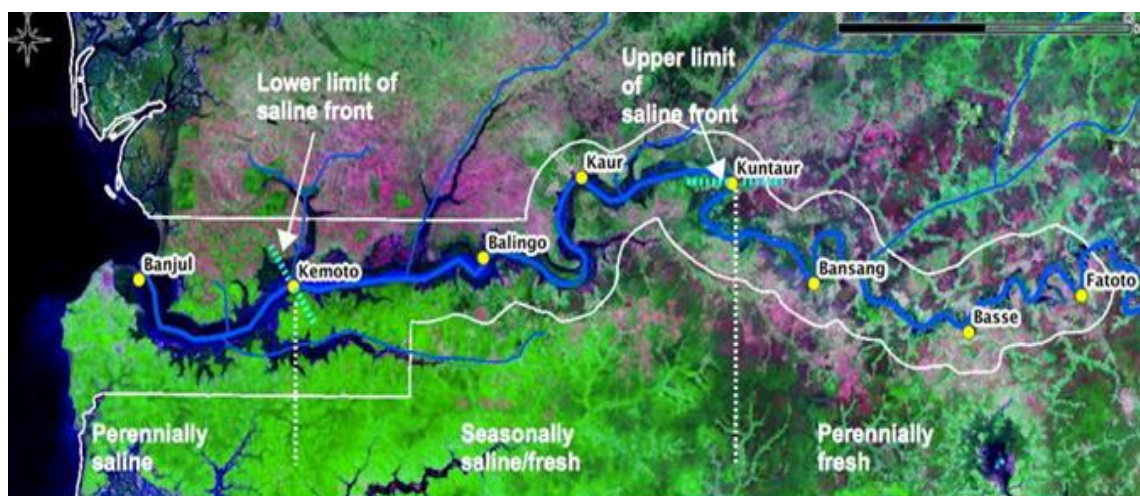
country are becoming drier, with return periods for poor rainfall of between 4-8 years (depending on the location) and a delayed start to the rains, but with extremely good rains every 8-10 years.

187. The larger overall drying trend of the last 40 years had a profound impact on water resources: dried up springs and streams and falling water tables, contraction of seasonally flooded swamps and enhanced saline intrusion. Since the 1960s, large areas of freshwater swamps in Western Gambia have been replaced by salt plains or salt-water marshes because of reduced fresh water inflow from storm run-off, preventing rice production in North Bank Region and Western parts of Central River Region. Discussions with communities during the concept design mission revealed that 50% or more of productive lowlands have been lost in some areas due to changes in environmental conditions, displacing agricultural activity to the uplands, which are already under pressure.

188. In addition, temperatures (hot days and nights) are increasing with implications for crop productivity and the incidence of pests and diseases. The incidence of red spider mites, which attack vegetables and for which there is no known appropriate pest management remedy, is temperature related and a more frequently occurring problem, as are snails. Pest occurrences such as armyworms and termites attack rice and are associated with dry spells.

189. The most vulnerable areas from a climate change perspective will be the lower-central part of the country where saline water (see Figure 3 below for extent of salt-water intrusion and limit) meets freshwater, the balance of which is determined by rainfall conditions and, increasingly, sea level rise. However, other regions are also vulnerable. In the Western part of the country, which is more densely populated, lowland rice and horticulture are vulnerable to saline ground water resources and short return periods for low rains and heavy rains that will worsen land degradation in the uplands. In the Eastern part of the country, rainfall variability threatens both droughts and floods, and here too temperature increases will be felt more keenly.

Figure 3: Salt-water intrusion distribution and current limits

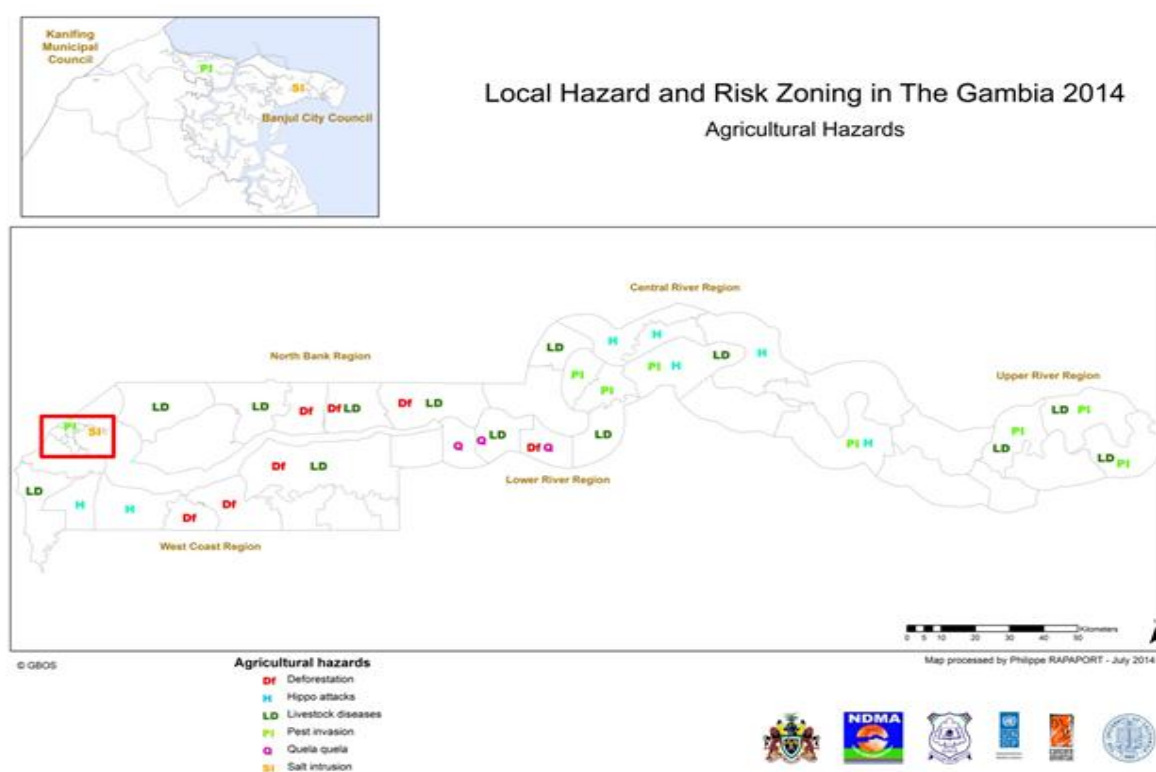


190. The country is vulnerable to vector-borne diseases including cholera, meningitis, malaria and diarrhoea. At least 40,000 people are affected each year by floods, mainly in the Greater Banjul area. Overall, water and sanitation-related deaths account for 20% of the under-five mortality. These factors continue to damage lives and livelihoods for 40% of vulnerable people in The Gambia. Increases in temperature and changing patterns of rainfall will worsen the disease burden.

191. Baseline environmental conditions are deteriorating and, though the links to climate change are less certain for lack of research, it is conceivable that many of these impacts will become magnified with sea level rise and lower average rainfall. The emergence of salt intrusion into productive lands is estimated to be more than four decades old and has caused a catalogue of associated problems in recent years in the ecosystem balance and livelihoods that depend upon it. Salt intrusion into agricultural land is a principal factor causing food insecurity in Western areas of The Gambia, affecting women disproportionately since traditionally they are the rice growers.

192. A recent community vulnerability assessment has mapped the hot spots with high risk to both natural (bushfires, causal erosion, drought, floods, lightning storms, mangrove depletion, salt intrusion, soil erosion and wind storms) and agricultural hazards in the country (see Fig 4 below). These threats have a profound impact on the livelihood situation of the rural communities who depend entirely on their natural resource base.

Figure 4: Agricultural hazards mapping across the regions in the country



193. **Gender and youth dimensions of vulnerability.** One in five households in The Gambia is headed by a female, mainly because of the migration of males to urban areas and overseas, (*Nema Gender Strategy Paper*). Women's poverty is closely linked to their high illiteracy level (73% of women), the absence of economic opportunities, inadequate access to economic resources, including credit, land ownership, skills and support services. About 67% of the population is aged below 25 years, (2009 National Youth Policy). The factors that make women vulnerable, such as poverty, power relations, lack of economic power, low level of education and lack of or limited technical knowledge, are also the key issues for youth.

194. Despite the provision promulgated in the Gambia Women's Act 2010, that every woman should have the "right to acquire and own moveable and immovable property and to administer, manage and dispose of the property freely without restrictions", land ownership

in The Gambia still traditionally favours men. Customary biases often mean that women do not exercise their land rights; neither do they have the financial resources, knowledge and capacity to go against social norms. Management systems are weak, resources to address gender bias are extremely limited and there remains significant community antagonism to women's equal rights. A shift is needed in the thinking, attitudes and understanding of men and women, as well as among officials, decentralised government structures and traditional authorities.

195. The Gambian National Agricultural Investment Plan (GNAIP), the Gambia Sustainable Land Management Investment Framework 2016-2020 (GAMSIF) and the National Rice Development Strategy (NRDS) all note the concern that a "*feminization*" of poverty is underway, exemplified by higher levels of poverty among female-headed households - estimated at 18% of the rural households - of which 63% fall below the poverty line compared to 48% of male-headed households. Most women are subjected to the general insecurity that is associated with secondary rights. They are not able to develop borrowed land for long-term economic benefits and they risk losing borrowed land, as was the case in the Pakalinding women's *kafo* vegetable garden visited by the Chosso design team. This is a particular problem for multi-year investments.

196. Conflicts have taken place when men have attempted to recall the secondary right after women have already invested in infrastructure (wells, fencing) and/or planted trees. Given the potential for male take-over of the project in rice production, should it be seen to become profitable as forecast under *Nema*, it will be incumbent on the project to maintain its focus on empowering women to keep control of assets and production through consistent and sustainable capacity development support. This goal is being promoted currently through the Functional Literacy Programme and the Farmer Field Schools, and being complemented with tailored entrepreneurship training.

197. A study commissioned by Action Aid found that, in all the communities studied, land is controlled by men with women having limited access in most cases, except for rice cultivation, which is practiced by women in the traditionally held lowlands. The majority of women do not have primary rights to land, though some do inherit land and others are beginning to purchase it outright in West Coast Region.

198. Traditionally, gender division in agricultural production has been the *modus operandi*. Men are engaged generally in upland mechanized cropping, usually groundnut, maize and millet, while women are engaged mainly in rice cultivation using intensive labour methods. This gender division is slowly breaking down with women moving into groundnut production and men being engaged in growing improved rice, with the introduction of NERICA rice varieties to a point of dominance in upland farming systems. However, the bulk of rainfed rice production, the main source of the country's domestic rice supply, is owned and managed by women. Women also provide labour on male-controlled irrigated rice. Men cultivate upland coarse grain crops (maize, sorghum and millet) as well as groundnut, cotton and irrigated rice.

199. The Youth of The Gambia make up at least half of the population, (the precise proportion depends on how youth is defined). Consultations held for the preparation of the 2009-18 Youth Policy, revealed that traditional power structures and limited opportunities to participate in the national development process were key constraints to decision-making and contribute to their low status in society. Gambian young women lag behind the young men with an illiteracy rate that hovers around 20-30%. This rate has a

direct correlation to access to income-generating opportunities, because if one lacks information, one cannot make informed decisions.

200. **Nema adaptation issues and targeting dimension.** *Nema* is engaging in important initiatives to improve the economic empowerment of women, primarily through its Functional Literacy Programme and Farmers Field Schools and secondly by including a set of provisions to address the constraints women face that limit their productivity, (such as lack of access, control and ownership of land, credit, technology and extension services), and the application of minimum quotas for women and youth participation in project activities. Expected climate change effects will add to the burden affecting women and, without targeted action, may negate some of the benefits of *Nema*.

201. The main climate change issues for women and youth can be summarised as follows.

- Male dominance in planning meetings prevents the voice of women and youth on the design of climate change adaptation plans and affects motivation levels to engage in the project.
- Productivity increases for rice do not materialise because of increasing salinity in the soils and heavy rainfall degrading the dikes, leaving women and youth no better off and contributing to the trend for the outward migration of rural youth.
- Heavy rains lead to more sedimentation run-off, (particularly with the continued degradation of the watershed), and higher temperatures affect weed growth, leading to a bigger maintenance requirement for tidal irrigation structures which increases the call on women's time and reduces both their productivity and motivation levels.
- Poor rains mean failed rice harvests, which affects women's status in the household and could lead to conflict.
- Inefficient use of water in wells for horticulture production through spillages and blanket application, exacerbated by increasing water scarcity from climate change, increases recharge times. Rationing is already required, setting the scene potentially for conflict, particularly in dry years when there is likely to be greater reliance on horticulture for food security.
- Lack of access to appropriate seed varieties to respond to projected changes in seasonal rainfall patterns affects productivity. Changing incidences of pests and diseases is part of this complex agronomy, particularly in dry years, wet years or years when rainfall variability is high. A high failure rate would have the potential to affect motivation levels to engage in the project among women and youth.
- Health impacts from changing patterns of rainfall, (lows and highs, and breaks in mid-season), in the context of an already-serious food security challenge and high levels of malnutrition especially among women and children.

202. **Chosso indicators and targeting.** The following targeting indicators are proposed to address the climate change risks to *Nema*. They are focused on women and youth in relation to potential climate change impacts on the project. Most are intended to contribute data to a recognised problem in The Gambia, the lack of gender disaggregated *impact* data, as opposed to input numbers such as numbers of women participating in decision-making processes.

Nema outcomes	Chosso targeting indicators
Outcome 1: Watershed Development	# women and youth taking part in climate change sensitisations.
	% change in annual burden of illness for women from changes in environmental conditions and nutrition status, (days and type of illness).
	# women benefitting from water availability for supplementary agricultural purposes in low rainfall years. Annual benefits per woman received, (income or food security).
	# ha of vegetable gardens under improved water use and conservation practices for both women and youth groups.
	Annual provisioning benefits, (income from fish, honey, fruit processing and/or food security impacts), from mangroves and agroforestry accruing to women, youth and men.
	% change in annual women's productivity from vegetable gardening as a result of time savings from improved irrigation systems installed, (hours saved, improved yields, improved income from alternative activities).
Outcome 2: Agricultural Commercialisation	# individuals in women and youth groups in a continuous learning process to acquire know-how and technologies to manage climate-related risks.

Appendix 3: Country performance and lessons learned

Country Performance

203. The Gambia COSOP approved in 2003 set out to build on and consolidate the real achievements of earlier project interventions. The three key objectives were stated as:

- adopting an integrated watershed management approach to the development of land and water resources;
- improving returns to farming by strengthening market linkages and broadening the range of income opportunities both on- and off-farm; and
- strengthening the delivery of essential services, including credit.

204. IFAD's focus on the grassroots levels in rural areas was to be continued, with special attention being paid to the socio-economic development and empowerment of women and youth, grassroots participation and indigenous knowledge. *Nema* contributes to two purpose statements of the COSOP: Purpose 2: *Improved level of agricultural income and food security in rural areas*, which has higher value of agricultural commodities produced and marketed and higher agricultural yields as indicators; and Purpose 3: *Reduced vulnerability to major threats on rural livelihoods*, for which one of the indicators is "crop production depends less on weather". The COSOP also mentions weather-related risks as causes of rural poverty, (see Appendix 2).

205. Specific implementation problems have included limited reporting of impacts from ongoing projects due to overdependence on physical output indicators. Smallholders, especially women, have achieved marked improvements in their production, assuring some degree of household food security. However, the increasingly unpredictable rainfall patterns continue to constrain production, as does the lack of access to services including reliable and timely weather information, inputs, affordable regular and certified seeds, land preparation and advice, among others. Women farmers are often the most vulnerable, especially those who do not have access to credit to take full advantage of the rainy season.

206. At the policy and institutional levels, there are a number of policy and framework gaps that hamper the coherent and sustainable development of national agricultural land and water resources and fail to provide key foundations to support a broad-spectrum of domestic rice production, which is the main staple food produced by smallholders (especially women) in the country. In collaboration with the Coalition of Africa Rice Development, IFAD through *Nema* has supported the Government to develop and validate the *National Rice Development Strategy* (2013) which concluded that a number of challenges still remain but that, given current levels of investment, the country would become self-sufficient in rice by 2024. This is in sharp contrast to GoTG's recent *Vision 2016* agenda of seeing the country become self-sufficient in rice by 2016.

207. The *Agriculture and Natural Resources Policy 2009-2015* was approved as an overarching policy but has not been implemented fully due to a lack of resources and continuity in leadership within the key ministry. In particular, agricultural land and water interventions are not approached in an integrated fashion despite being the critical resources upon which the majority of farmers depend, especially women. This issue is compounded by the limited human and technical resources in government service resulting from little or no investment in and training of a new public sector cadre to replace retiring staff.

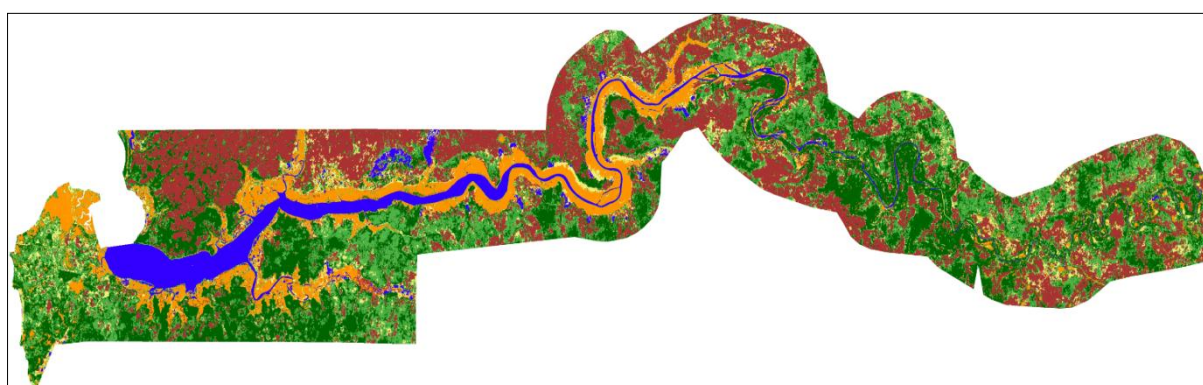
208. Given the historical investments in agricultural land and water resources by many donors and factoring in the increasing threat of highly unpredictable climate change effects, (with the country experiencing recurrent floods, droughts and rising sea levels), the absence of a robust framework/strategy for sustainable agricultural land and water development will continue to put the country and especially the smallholder farmers in a vulnerable situation that will undermine their future livelihood security.

209. However, some of these difficulties have been addressed by ongoing projects in the last five years through a series of measures including direct supervision and implementation support by IFAD, a more focused design of investments, and a clear alignment of institutional responsibilities for project implementation. These initiatives have resulted in improved dialogue with Government and other donors, and enhanced capacities in project management.

210. IFAD, through *Nema*, has supported the MoA to develop and operationalize the *National Agricultural M&E* system with its accompanying *Gambia National Agricultural Database* (GANAD), which is ensuring all projects and government institutions are linked to a unified system and providing agricultural statistics that would be aggregated and disaggregated across sectors, value chain actors and regions. It is expected that the data and information generated would enhance effective planning, coordination, monitoring and evaluation of agricultural projects and programmes to improve policy and decision making efficiency in the country and to ensure that development partners have accurate information and data for better investment decisions.

211. In parallel, IFAD has fostered partnership with European Space Agency to pilot the application of Earth Observations in The Gambia and this has resulted in the creation of high resolution mapping of national land cover (see below) and an informal learning network: *Gambia Earth Observation Network* (GEON). There are prospects from partners involved in this pilot to continue this innovative initiative with external funding.

Figure 5: National land cover baseline map, January 2014



Agricultural area, Mangrove – Sandbanks, Water, Bare soil-weak vegetation (low biomass), Medium vegetation (medium biomass), Strong vegetation (high biomass).

Lessons learned

212. A successful characterisation of all IFAD-financed operations in The Gambia has been the inclusion of innovative pilot operations with potential for scaling up. In this way, the application of IFAD's accumulated know-how and experience minimises any potential risk of future project failure. This is particularly the case with the ongoing two operations namely, LHDP (2010-15), which is scaling up the Rural Finance and Community Initiative Project

(1999-2006), and *Nema*, which was designed explicitly to consolidate the gains in RFP, PIWAMP and LHDP.

213. To this effect, the main lessons learnt during implementation of the IFAD operations, as validated by recent PCRs and reviews and currently being subjected to a first-ever country programme evaluation by IFAD's Independent Office of Evaluation, are anchored in the following key spaces:

Policy and fiscal spaces: i) GoTG is emphasising a shift from a project- to a programme-based approach within the GNAIP framework; ii) enabling environment promoting market-oriented smallholder agriculture based on selected commodity value chains; iii) doubling of national budget allocation to agriculture from 3% in 2008 to 6% in 2011; iv) a favourable policy environment promoting both the intensification and the extensification of irrigated agriculture and land development (*Gambia National Rice Development Strategy*); v) GoTG's recent *Vision 2016* agenda to become rice self-sufficient triggering the reprioritisation of resource mobilisation to achieve this national drive; and vi) championship of climate change through key institutions in planning and programming engenders its incorporation into policy and programming. The placement of the Focal Point of the Green Climate Fund in the Directorate of Budget at the Ministry of Finance and Economic Affairs is facilitating the mainstreaming of climate change in policy and programming of key sectors of the economy.

Natural resource space: i) adequate water resources which could be mobilised through appropriate and cost-effective irrigation technology (tidal and solar pump) for the all-year-round multiple use of water; ii) untapped irrigation potential as currently less than 7% of the potential agricultural land is under irrigation¹⁰; iii) the lowlands remains the ecosystem with greatest potential for improved rice value chain development; iv) degraded land/soil could be reclaimed for enhanced production through investment in conservation structures and soil amelioration techniques; and v) climate variabilities and frequencies are impacting significantly on the natural resource endowment and "business as usual" is no longer an option in the face of the rapidly-deteriorating NR base upon which majority of the increasing population depends for their livelihoods.

Partnership space: i) growing interest by youth to engage in market-oriented horticultural production and the possibilities for them to take advantage of off-farm income-generating activities as private operators along the value chain; ii) rapidly increasing number of financial institutions that could provide medium- to long-term investment in agricultural businesses on a conventional risk-sharing basis; iii) the emergence of private sector actors including organized commercial agricultural farmers and larger private enterprises interested in value chain activities that are venturing into contract-farming to meet the growing demand for quality foods in peri-urban and urban markets; iv) increasing number of both bilateral and multilateral partners interested in scaling up successful approaches to maximise the impact of their interventions through quick-win cofinancing modalities; v) targeted partnerships are required when advanced tools (in earth observation and GIS/RS) are to be used systematically to improve planning, monitoring and investment decisions at all scales; and vi) local capacity building is a critical aspect.

¹⁰ The estimated total irrigable land is more than 80,000 ha of which currently 2,500 ha is under irrigated rice and 800 ha is under irrigated horticulture production.

Learning space: i) Innovations need to be piloted before scaling and IFAD operations have indeed included interventions that were first piloted and scaled up in subsequent projects by achieving positive results; ii) support to gender-sensitive community development plans coupled with participatory mapping enhances beneficiaries' real sense of ownership of development outcome processes; iii) a watershed approach is the most optimal in addressing the complexity of the many cause-and-effect relationships between uplands and lowlands vis-à-vis the hydrological dynamics of the River Gambia; iv) land and water management activities can reduce women's labour constraints; v) providing users of natural resources (common pool) with alternative livelihoods (including vegetable gardening, oyster culture, honey production, other non-farm income generating activities) eases pressure on fragile natural resources as well as building their resilience to climate change; vi) establishment of Farmers Field Schools is proving to be an effective means to test and validate innovations before farmers are convinced to adopt; vii) introduction of improved and high-yielding rice varieties (such as NERICA) has increased yields in both the uplands and lowlands; viii) consolidation of the gains made by LADEP and PIWAMP by constructing infrastructure for tidal irrigation, particularly in areas with perennial water bodies; ix) tidal irrigation has a profit-cost ratio of 2.02 compared to 0.72 for pump irrigation and that every 1 m³ of water pumped from the Upper River of the River Gambia, the salt front can move up to four kilometres upstream; and x) investment in low-cost and low-technology water control structures and land improvement techniques has enabled the sustainable cultivation of farmlands and the reclamation of perennial flooded and salt-affected lands.

Institutional/organisational space: i) cost-effective implementation can be assured by a small and relatively independent implementing unit working in harmony with existing Government structures; ii) strengthening and using existing implementing structures is more cost effective and becomes a leveraging factor for donors with a view to avoiding duplications of effort but maximising the effective use of scarce resources; iii) the establishment and resourcing of the Central Project Coordination Unit (CPCU), Department of Agriculture with its nine service units and six Regional Agricultural Directorates (RADs) would enhance service delivery but a number of challenges need to be addressed systematically to ensure the full operational, functional and structural effectiveness, coordination and efficiency of GNAIP implementation; iv) providing timely access to early warning information for stakeholders, particularly farmers, enables them to take rational decisions including choice of crop enterprises and varieties; and v) Public institutions should have the capacity to provide tailored and appropriately packaged technical information to ensure its understanding and utilization, particularly by communities with large proportions of illiteracy.

Cultural spaces: i) farmers and communities have some experience in dealing with climate change and thus their local knowledge should not be downplayed when introducing measures to strengthen their resilience; ii) young unmarried females interested in farming usually can utilise a proportion of their mother's farm plot to cultivate a crop but are obliged to provide labour and a proportion of their harvested produce to their mother in return; iii) young married females are usually allocated a piece of land by their mothers-in-law with the rationale to ensure household food security; iii) traditional drama groups are effective as communication tools to reach to community members through their local language; iv) land ownership is still vested in males and women have only access rights to lowlands, vegetable gardens and often

uplands; v) involvement of communities in participatory processes, including decision making on resource utilization and benefit sharing ensures their sustainable utilization and maintenance; and vi) in the case of Community Forestry Management, communities assume eventual ownership and retention of revenue from the resources, which has ensured protection of the forests from logging and bushfires.

214. Lessons from other donors include:

- large centralized irrigation schemes are not sustainable;
- simple and low-cost irrigation technologies are more sustainable as operational and maintenance costs are affordable to beneficiaries;
- well-organised small-scale farmers are capable of managing irrigation schemes (rice and horticulture) if they have access to improved seeds and credit as well as capacity building; and
- vegetable gardening can be profitable using solar pumping (assuring water security) if there are well-developed marketing chains, given the perishability of the produce.

215. Additional lessons drawn from the GEF-SLMP Mid-term Review are:

- it is important that target beneficiaries undergo proper and specific capacity building and training process before they are involved in participatory decision-making and planning processes with a strong innovation component, especially projects addressing climate change/mitigation or some other aspect environment/NRM; and
- participatory approaches to developing community action plans seem effective in that beneficiaries are at the forefront of identifying problems and setting priorities and thus they assume ownership of the development process.

Appendix 3.1: Summary of country adaptation priorities and *Nema* climate risks

The following table summarises the adaptation options identified in the 2007 NAPA, the 2011 NAMA and the 2012 2NC, and initial screening of whether *Nema* addresses these adaptation needs.

Table A3.1: Assessment of adaptation measures addressed by *Nema* investments

Technology	Adaptation measures proposed	<i>Nema</i> investment proposed?
Agriculture	From NAPA: 1. Erosion control 2. Water control 3. Crop rotation 4. Irrigated agriculture 5. Agroforestry 6. Integrated Pest Management 7. Irrigated agriculture and fish farming 8. Crop diversification 9. Farm support 10. Animal traction ploughing 11. Mechanised ploughing 12. Suitable crop varieties 13. Micro-finance 14. Off farm employment 15. Food processing	1. Yes 2. Yes 3. No 4. Yes 5. No 6. Yes 7. No 8. No 9. Yes 10. No 11. No 12. Yes 13. Yes 14. Yes 15. Yes

Technology	Adaptation measures proposed	Nema investment proposed?
Rice production	<ul style="list-style-type: none"> Selection of drought, pest, disease and salinity resistant high yield crop varieties under local conditions. The genetic potential of local crop species must be investigated and specimens stored in seed banks (2NC). Recent technology development of short-cycle and low input crops such as NERICA (NAMA). Dual purpose bunds/dikes for run-off checks, water retention and introduction of bund stabilisation dikes using multipurpose tree species with good root matting (NAMA). Change in planting dates and replacement of long duration upland and lowland rice varieties with short duration varieties (2NC). Demonstration, promotion and diffusion of improved post-harvest storage and technologies, in order to reduce extensive cultivation of marginal lands (2NC, NAMA). Strengthening the capacity and the establishment of a national agricultural research institute (NARI), the Department of Agriculture and others will help address adverse trends in farming systems (NAMA). 	<p>Yes</p> <p>No</p> <p>Yes, dikes, but no use of trees.</p> <p>No</p> <p>Yes</p> <p>Yes, IsDB cofinancing.</p>
Water resources	<p>From NAPA:</p> <ol style="list-style-type: none"> 1. Relocation of boreholes 2. Artificial recharge 3. Interception wells 4. Flow regulation 5. Phytoextraction of salt 6. Water harvesting 7. Increase water column in wells/boreholes 8. Erosion control 9. Improve drainage system 	<ol style="list-style-type: none"> 1. No 2. Yes 3. No 4. Yes 5. No 6. No 7. No 8. Yes (SLMP). 9. Yes
Irrigation	<ul style="list-style-type: none"> Tidal/flood irrigation. Other irrigation techniques considered are sprinkler and drip irrigation (2NC, NAPA). Adjustments to improve soil nutrient content and water holding capacity. 	<p>Yes</p> <p>Yes</p>

Table A3.2: Assessment of climate change risks on Nema investments and feedback loops

Outputs	Additional information	CC risk and vulnerability for <i>Nema</i> (additional to risk reduction investments made by <i>Nema</i>)
Component 1. Watershed development		
<ul style="list-style-type: none"> Communal watershed plans. 4,000 ha of upland rice production and 12,400 ha of lowland rice production through construction of rainwater harvesting and water control via contour bunds, bridges, dikes and spillways. 2,000 ha of tidal rice production through construction of tidal irrigation via dikes, canals, gates, fields and access roads. 150 ha of irrigated vegetable production through upgrading of irrigation systems based on groundwater abstraction. 2,500 ha or road/track upgrading to improve accessibility to the rice fields and vegetable gardens. 10 local markets constructed (storage facilities, water supplies, sanitation). 	<ul style="list-style-type: none"> The project design report included rainwater harvesting which would have the benefit of controlling the short periods of heavy rains and protect livelihoods in periods of low rainfall. However, these interventions have not been costed and are likely to remain unfunded. The dry season crop planned for paddy rice areas will therefore not materialise. There are two types of dikes. One is for lowland areas, which would protect land adjacent to the river against annual spring tides as well as capturing rainwater in order to dilute salinity coming up from the ground water and make the land productive. The second type is flood protection for tidal irrigation areas to protect them against drainage congestion from high rainfall events. The high yield potential and low operating costs of tidal irrigation support a relatively high initial investment per ha for tidal irrigation development. A stepped approach will be followed in converting rice production areas in order to monitor costs. Vegetable production will be irrigated with ground water using solar pumping 	<p>Heavy rainfall/flash floods</p> <p>Surface water</p> <ul style="list-style-type: none"> Siting of river defences and design of dikes, bunds and access roads and bridges to withstand the pressure of heavier rainfall effects and effectively capture water, given also rainfall run-off rates. Impacts of agricultural chemicals on river water quality, given also changes to rainfall intensity and saline intrusion into the River Gambia. Effects on erosion of top soil in upland areas and siltation of river and sedimentation on rice producing fields in low land areas. <p>Other</p> <ul style="list-style-type: none"> Human health and environmental health risks from higher rainfall variability, particularly coupled with higher temperatures. <p>Ground water</p> <ul style="list-style-type: none"> Could affect recharge negatively if land does not have adequate vegetative cover. <p>Low rainfall/droughts:</p> <p>Ground water</p> <ul style="list-style-type: none"> Salt-water intrusion into lowland rice production areas as well as tidal areas. <p>Surface water</p> <ul style="list-style-type: none"> Die-back of mangroves affecting freshwater marshes and crop production inland. <p>Other</p> <ul style="list-style-type: none"> Changes in soil management needed given lower uptake of nitrogen. Loss of soil moisture. Pests, diseases and weeds.

Outputs	Additional information	CC risk and vulnerability for <i>Nema</i> (additional to risk reduction investments made by <i>Nema</i>)
	<p>plus an elevated water storage reservoir. A stepped approach will be followed in order to monitor cost effectiveness.</p> <ul style="list-style-type: none"> • Upland bunds will slow down rainfall run-off, increase infiltration and divert water into areas that can be used for rice production. • The local markets will be located close to the LHDP clusters of village vegetable gardens and rural growth centres. 	<p>Sea level rise</p> <p>Ground water</p> <ul style="list-style-type: none"> • Abstraction points/boreholes increasingly saline affecting vegetable production. • Inefficient use of ground water for horticulture production contributing to saline water intrusion. <p>Surface water</p> <ul style="list-style-type: none"> • Hyper-salinity causes mangroves die-back and salinization of freshwater zones.

Table A3.3: Nema cofinancing complementarities

IFAD (USD 35 million)		IsDB (USD 15 million)		AfDB (UA 11.5 million)	
National Agricultural Land and Water Management Development Project (<i>Nema</i>), Total Project Cost is USD 65 million.		Building Resilience to Recurring Food Insecurity in The Gambia (estimated project cost USD 63 million).		Programme Building Resilience against Food and Nutritional Insecurity in the Sahel/P2RS (estimated total cost is UA 13.53 million).	
Component	Subcomponent	Component	Subcomponent	Component	Subcomponent
<i>Nema</i> Project Support Unit established by IFAD					
Watershed Development (estimated cost is USD 52 million with IFAD financing of USD 24 million)	Communal watershed planning	Building Resilience to Climate Change and Enhanced Food Security (IsDB financing is USD 12.6 million)	Provision of household/Community Storage Facilities	Development of Rural Infrastructures (estimated cost UA 6.4 million)	Development of irrigation infrastructure (tidal irrigation, water harvesting,
	Water management for rice cultivation (lowland, tidal irrigation and upland conservation)		Provision of National Food and Seed Storage Facilities		Pastoral facilities
	Village Vegetable schemes		Integrated Watershed Management and Development (IsDB will fund USD 12.13 million)		Preservation/processing and marketing infrastructure development
	Access roads and Market infrastructure		Development of a National and Regional Information System for the Management and Prevention of Food Crisis		Basic social infrastructure development
Agricultural Commercialization (estimated cost USD 7.9 million with IFAD financing of USD 6.5 million)	Producer Organizations	Rehabilitation and Preservation of Rural Livelihoods (IsDB will fund USD 0.53 million)	Support to Crop Production	Development of Value Chains and Regional Markets (estimated cost UA 5.1 million)	Capacity building
	Value addition for rice and vegetables		Support to Livestock production		development of plant sectors
	Technical Support Services	Project Management (IsDB will fund USD 1.14 million)	Support to Project Management and Administration		protection of natural resources and timber
Project Facilitation (estimated cost USD 5.4 million with IFAD financing USD 4.5 million)	Project Management and Implementation Support		Monitoring workshops/familiarization visits		Development of livestock sector
	Knowledge management and M&E capacity		Design and Supervision		Development of fisheries sectors
			Annual Knowledge sharing		improved market access and funding
					Nutrition strengthening
				Project Management and Coordination (estimated cost UA 1.1 million)	Project management

Table A3.4: Current and planned investments in the rice and horticulture sectors in The Gambia

Project	USD millions of direct support	Implemented by	Start date	Relevant outputs
AfDB				
National Water Sector Reform project	2.6	Ministry of Fisheries and Water Resources & National Water and Electricity Company (NAWEC).	2010	<ul style="list-style-type: none"> Long term water resources management strategy. Improved network design for hydrological, hydro-geological, water quality and meteo data. Ground water study and hydro-geological map.
Food and Agriculture Sector Development Project (FASDEP)		Department of Agriculture	2013	<p>Improved land management on 5,000 ha:</p> <ul style="list-style-type: none"> 1,600 ha lowland comprising 200 ha of intensive rice irrigation schemes, provision of access infrastructure for 500 ha of difficult but fertile tidal flood plains, and construction of water retention facilities to support the development of 900 ha of arable lands; management of 3,000 ha of existing developed tidal areas to ensure double cropping for enhanced productivity. soil and water conservation practices on an estimated 400 ha of upland complemented with development of agroforestry and community watershed/land use plans. <p>Establishment/improvement of 215 ha for high value horticultural crops (tomatoes, onions, green peppers, cabbages) with 155 ha for community gardens targeted at 1,500 women and 600 young farmers and 60 ha for school gardens; on-farm water management techniques and improved agronomic practices.</p> <p>Upgrading of 300 km of the existing feeder roads and market infrastructure in 20 municipal markets in the project area.</p>
LDCF				
LDCF (UNDP) cofinanced by GoTG & Islamic Development Bank Enhancing the resilience of vulnerably coastal areas and communities to CC	8.9 15 10	National Environment Agency (NEA) Dept Agriculture Dept Fisheries	2013	<ul style="list-style-type: none"> Coastal protection measures (offshore reefs, beach replenishment and rock groin structures) 1,500 ha of lowland rice production areas protected by flow control structures (dikes, tidal gates) in minimum three locations in the interior (Dasalami/Illiasa, Blntang and Tendaba). Reclaiming land. Testing 'salt-rice-fish' concept (Bao Bolong wetland region) National food security assessments and early warnings. Rice development and testing.
UNDP-UNEP Strengthening climate change early warning systems	8	Department of Water Resources, Ministry of Environment, Parks and Wildlife, NEA and National Disaster Management Agency	2011	<ul style="list-style-type: none"> Hydro-met network upgraded. Early warning products developed. Communication channels created.
FAO Adapting Agriculture to climate change in The Gambia	6.3	Dept of Agriculture	Project design phase	<ul style="list-style-type: none"> Diversification of livelihood strategies and intensification of agriculture production, processing and marketing. Improved livestock production and management practices.

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Strengthening Climate Resilience of the National Agricultural Land and Water Management Development Project – Chosso

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Appendix 3: Country performance and lessons learned

Project	USD millions of direct support	Implemented by	Start date	Relevant outputs
GEF Trust Fund				
IFAD-AfDB: Sustainable Land Management Project (attached to PIWAMP)	4.4	Department of Agriculture, NEA	2009	<ul style="list-style-type: none"> Land reclamation and SLM/conservation agriculture implemented: 3,120 ha. Uplands erosion control and rangeland management. Mangrove restoration: 900 ha.
FAO-UNEP: Canary Current Large Marine Ecosystem (CCLME)	8.8	NEA	2010	<ul style="list-style-type: none"> Trans-boundary water management. Pilot mangrove restoration projects as part of the Biodiversity, Habitat and Water Quality component.
Islamic Bank				
Community-based infrastructure and livelihood improvement project (CILIP)	18	Department of Agriculture	2012	Community infrastructure (roads, clinics, water supply) and livelihood activities, developing, strengthening and synergizing pro-poor local institutions/groups and enhancing skills and capacities for the poor. Focus on 200 settlements in peri-urban areas.
European Union				
GCCA: Integrated coastal zone management and the mainstreaming of climate change	5	NEA, Department of Water Resources	2012	<ul style="list-style-type: none"> Coastal protection. Ecosystem rehabilitation projects.
World Bank				
Commercial agriculture and value chain management project	16	Department of Agriculture	2014	<ul style="list-style-type: none"> Rehabilitate and improve of tidal irrigation schemes as well as key productive infrastructure. Strengthen capacities of farmer-based organizations and professional associations in the value chain.
West African Agricultural Productivity Programme (WAAPP) (with support from Spanish Government).	12	Ministry of Agriculture	2011	<ul style="list-style-type: none"> Enhance the production and productivity of rice through value chain development. Strengthening institutional mechanisms and procedures for generating, disseminating and adopting improved agricultural technologies and tools. Strengthening institutional mechanisms and procedures for integrating regional rice markets and cross-border/national dissemination of technologies. rebuilding of the capacities for adaptive research and technology transfer. agricultural research and advisory services.

Appendix 4: Detailed project description

216. *Chosso* activities are set in the framework of the ongoing *Nema*, which comprises two substantive components – *Watershed development* (79.5% of total project cost) and *Agricultural commercialization* (12.2%) – supported by *Project facilitation* (8.3%). The following sixteen discrete *Chosso* subcomponents/activities are presented as either modifications (identified as “M”) to the *Nema* design under implementation, to ensure that the planned outcomes are protected to the extent possible against the adverse effects of climate change, or as enhancements (“E”) that enlarge the scope of *Nema* expressly to restore the damaged productive natural resource base, to enhance the adaptive capacity of the target beneficiaries, and to learn how to increase the resilience of the rural economy for future generations. Of these, the only new subcomponents/activities introduced to the *Nema* structure are 1.2.5 *Community water harvesting* and 1.5 *Community forest restitution*.

217. It is notable that the *Chosso* investment cost per activity per beneficiary varies considerably between interventions. Leaving aside the project overheads, in ascending order, the supplementary investments in the substantive subcomponents range from less than USD 17/beneficiary (Climate risk information services, Communal watershed planning and Community woodlots) through USD 28-67/beneficiary (*Kafo* women vegetable schemes, Community water harvesting, Climate resilience for producers and Mangrove restoration), and USD 146-238/beneficiary (Community agroforestry, Youth vegetable schemes, Upland water control infrastructure adaptation, Lowland water control infrastructure adaptation) to Capacity building of technical service providers (USD 900/beneficiary) and Tidal irrigation scheme design adaptation (USD 1,682/beneficiary).

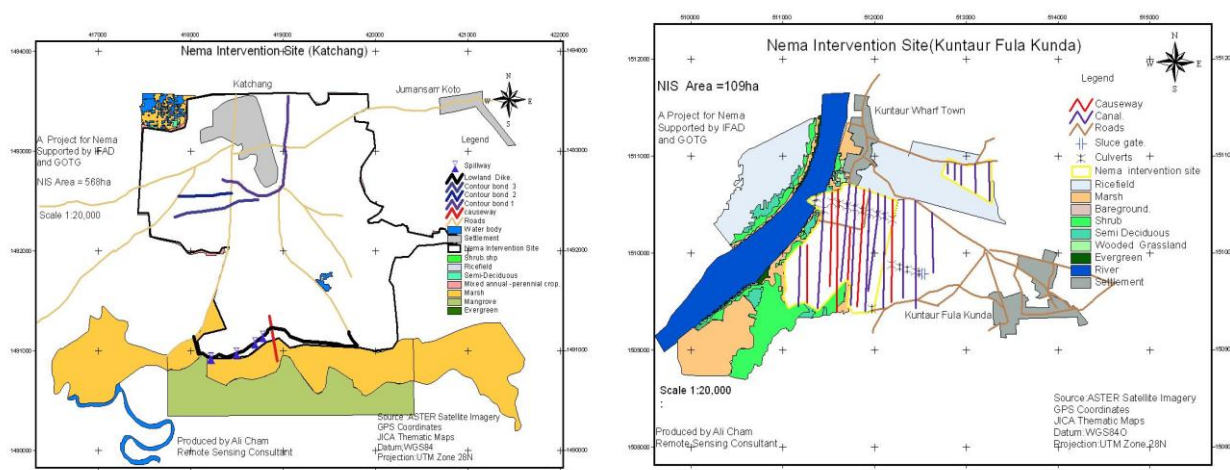
Component 1: Watershed development (USD 3.72 million)

1.1 Communal/*bantaba* watershed)planning (USD 0.22 million).

1.1.1 Community adaptation management capacity (E – USD 0.22 million, 4.5% of estimated total project base cost).

218. *Chosso* will undertake a campaign of community climate change sensitization at start-up, aimed at engendering understanding by the general public and stakeholders on the causes, effects and impacts of climate change on natural resources and livelihoods. It will be conducted using a variety of channels comprising traditional drama groups, community radio, Gambia Radio and Television Service (GRTS) and presentations of clear and focused messages on climate change at national, district and village/*bantaba* levels.

219. This activity will enhance the capacity of communities to manage proactively the productive resources upon which their livelihoods depend, particularly in the context of the changing climate. Under the parent *Nema* project, communities are supported to develop action plans in which they prioritise their selected development interventions. Approximately 25 such plans are developed annually and currently *Nema* has contracted a service provider to generate GIS maps for each of the intervention sites as well as geo-referencing of the planned interventions, (see images below). However, the current plans do not take into consideration fully the interactions among communities in a shared watershed or the impacts of their plans on neighbouring communities.



220. The project would enhance the capacity of communities to plan at the whole watershed level taking into account both increasing climate risks and the longer term development aspirations of the beneficiaries. The current communal/*bantaba* planning activities would be strengthened through the use of watershed management plan models based on simulations of rainfall and hydrological occurrences recorded in GIS-based thematic maps. This activity will focus on those communities where action plans are yet to be developed under *Nema* to enable a full integration of the *Chosso* intervention.

221. In close collaboration with the Department of Community Development (DCD), *Chosso* would develop a locally appropriate climate change adaptation curriculum and training tools, conduct Training of Trainer (ToT) sessions for 30 existing Multidisciplinary Facilitation Teams (MDFTs) of seven specialists across the country, and then promote step-down training in adaptation approaches and techniques for 120 communities.

222. The selection of communities from those expressing a strong interest in the training in adaptation techniques will be informed by the climate vulnerability assessment in the initial *Chosso* baseline study. With regard to the crucial issue of securing and managing water supplies for agriculture and livestock, the topics would include:

- local monitoring of water resources;
- the use of hydro-meteorological information;
- strengthening communication systems between users;
- the increased frequency of inspections of water control infrastructure; and
- the preventative maintenance of infrastructure.

223. A suitable service provider would be identified for developing the community-based adaptation modalities for the local context, building on existing tools and knowledge, and conducting the ToT sessions.

1.2 Water management for rice cultivation (USD 1.65 million).

1.2.1 Tidal irrigation scheme design adaptation (M – USD 0.35 million, 7.1%).

224. The tidal irrigation scheme (TIS) infrastructures, utilising the tidal rise and fall of the river level rather than mechanical pumping, are affected by climate change because the river flow deficits result in a reduction in the rise of water levels during the rainy season. On the other hand, intense rains could become more frequent occurrences with climate change,

resulting in adverse consequences for the prolonged flooding of rice fields by direct rain falling in the plots. The concentrated rains falling on degraded uplands result in increased sedimentation that, with weed growth, hinders the flow of water in primary canals requiring periodic desiltation that is a costly exercise for farmers. In this context, some fine tuning of the design specifications of irrigation structures and access causeways is proposed to ensure the economic life of the *Nema* TIS in the face of deteriorating hydrological scenarios related to climate change.

225. On a full-scale pilot basis, the primary canal of a number of TI schemes would be lined (4 km length of canal in total) together with the concretion of about 16 water distribution control structures/gates covering a target of 160 ha. The coating would be reinforced concrete, masonry cement or other sealing material that ensures good weather resistance. The lining of these canals is expected to minimise weed growth and sedimentation that impede water flows and potentially will intensify as temperatures increase. The lining will result in a reduction of the width of the primary canal required for the same command area. It will also compensate for the seepage and percolation losses associated with water flow in the main canal. The technical design will thus be adjusted to improve water conveyance and distribution efficiency.

226. In locations with a greater risk of flooding, a drainage system would be established on newly-created schemes. Complete detailed topographic studies would be done to ensure a drainage plane that removes excess water from plots within 48 hours (Technical designs with proposed modifications are included in the draft Project Implementation Manual – PIM).

227. The combined modifications are expected to reduce the burden of essential regular maintenance work on the tidal irrigation schemes. However, it is emphasized that the labour and financial costs of the operation and maintenance of such water management structures are affordable but not zero. *Chosso* would ensure that the smallholder users of the schemes have the necessary institutional set up and management skills to irrigate their crops efficiently year after year without any further subsidy from GoTG.

228. To ensure the sustainability of the major *Nema* investments in tidal irrigation, *Chosso* would enhance the water management/monitoring and operational capacity of the users of the schemes. *Nema*'s ongoing capacity-building programme, being provided to various farmer-based organizations and associations, would be augmented with practical training in scheme management to four water user groups (WUGs) given the responsibility for operating and maintaining TIS.

229. The WUGs would be provided with kits for monitoring salinity levels to enable smallholders to make informed decisions on varieties to plant and other agronomic interventions appropriate to their local conditions. This equipment would complement the water flow and other measuring devices of the Hydrology Division of the Department of Water Resources (DWR) to extend the coverage of the scientific observations of the River Gambia system.

1.2.2 Lowland water control infrastructure adaptation (M – USD 0.34 million, 6.9%).

230. With chronic lower consecutive run-off to rainfall, paddy fields in the lowlands bordering mangroves are becoming saltier and rice cultivation more and more difficult in these areas, (very low yields). The realization of side embankments can strengthen the presence of fresh water to the detriment of salt water and conserve the riverine-marine environment conducive to the growth of mangroves. The creation of drains perpendicular to

the river or its tributaries is a good technique to desalinate rice land over time by promoting the leaching of salts when the tides invade rice fields during the dry season.

231. The installation of lowland water control structures for rice cultivation is the central feature of the parent *Nema* design, accounting alone for 26.7% of the total estimated cost of the project's substantive investments. The standard design specifications of the dikes, bridges, spillways and related water control structures, particularly the most appropriate materials and the use of labour-intensive construction methods, have been and continue to be reviewed and adjusted by *Nema* managers with due regard to the cumulative experience of the first two years of implementation.

232. *Chosso* would meet the additional costs of modifying the designs of structures to ensure their economic life in the face of deteriorating conditions related to climate change. The supplementary investment would fund the surveys, studies and incremental costs for modifying the design of a nominal 18 km of dikes and ancillary infrastructure to cover a target of 720 ha.

1.2.3 Upland water control infrastructure adaptation (M – USD 0.27 million, 5.5%).

233. The *Nema* design specifications of the upland water control structures would also be refined in response to a progressively better understanding of the consequences of accelerating climate change, (primarily the increased intensity of rains over shorter time periods), and to implementation experience. Possible design modifications may include a series of dikes with reduced height, an adapted dike constructed at the most critical location, and/or the addition of structures to store diverted run-off for later use within the watershed, (see 1.2.5 *Community water harvesting* below).

234. *Chosso* will ensure a greater resistance to the adverse effects of climate on a nominal 15 km of upland water control structures covering 600 ha by:

- requiring service providers to invest more in the analysis of the foundation ground and choice of building materials;
- enhancing the stability of structures within the rules of construction and the cohesion of the materials used, (tests would indicate the most stable slopes function of the height of dikes); and
- studying the topography of floodplains in order to optimize the creation of run-off water control dikes. These studies would help to rationalize the implementation of water run-off control infrastructure. On flat terrain, space between bunds may prove to be much more important than on steep slopes.

1.2.5 Community water harvesting (E – USD 0.68 million, 13.8%).

235. Recent sectoral reviews have identified surface water harvesting, storage and efficient use, in particular of rainwater, as increasingly important in combating the adverse effects of climate change. The *National Rice Development Strategy (NRDS) – The Gambia*, (*Nema* 2013), for example, prioritises an Irrigation and Water Control Investment Strategy which includes among short-term (1-3 years) priority actions the “construction of rainwater harvesting and storage structures for small-scale irrigation and improving soil moisture through promotion of *in situ* soil moisture conservation technologies”.

236. Rainwater harvesting has not been regarded as a priority in The Gambia hitherto, but now offers an important opportunity to supplement supplies at the community level for off-season market gardening, livestock, fish ponds and other productive purposes, (not

exclusively agricultural). Rural communities are faced with increasing demand and decreasing aggregate water supplies for all purposes, particularly given the prohibitive cost of pumping, (fuel and maintenance).

237. In this context, *Chosso* would seek affordable opportunities to pilot new and/or modified surface water capture structures to supplement communities' traditional reliance on groundwater and river abstraction for non-rainfed agricultural purposes, including livestock. The central idea is to capture and store surface water during the rainy season before it runs into the river system for use in the long dry season. However, the scale and technologies of the proposed feasible community schemes would preclude the utilization of stored water either for the irrigation of extensive field crops or for domestic water supplies.

238. Whereas rainwater running into the upper reaches of the River Gambia may be utilised for irrigation downstream, the tributaries flowing into the saline lower reaches and estuary are not used for productive purposes, albeit they provide ecosystem services, with the brackish water pushing further upstream in many tributaries. The complicated hydrology of the river system and the aquifers coupled with increasing demand and the high costs of diesel pumping place a premium on conserving groundwater, moving from less to more efficient uses of finite supplies from all sources. Consequently, *Chosso* would seek feasible opportunities for downstream communities to make better use of perennial watercourses through capture structures, barriers to saline water incursion or other locally-appropriate technologies.

239. Community water harvesting would constitute an enhancement of the scope of *Nema* in line with communal/*bantaba* expressed priorities and an opportunity to pilot alternative modalities for future up-scaling.

240. Within the context of climate change adaptation, the project would identify those upland communities in the Central and Eastern parts of the country that both:

- are becoming increasingly vulnerable to water shortages in the dry season as a consequence of decreasing rainfall and increasing human and animal populations; and
- express an interest in constructing and maintaining a water harvesting structure.

241. It is likely that the main demand for supplementary productive water sources would come from communities in URR and CRR, the areas predicted as more vulnerable to declining rainfall patterns. However, water harvesting structures may also be appropriate for communities in WCR, NBR, URR and LRR with increasing ground and riverine water salinity challenges.

242. *Chosso* would assess the potential for and feasibility of requested community water harvesting infrastructure very close to the interested settlements by commissioning a comprehensive site identification exercise comprising three essential lines of enquiry on a case-by-case basis:

- *hydrological*, to determine the possibility of filling proposed water harvesting structures and informing the design of protection works;
- *topographical*, to identify the sites that can capture and store the most significant volumes of water at the lowest cost; and

- *geotechnical*, to identify building materials and foundations, and to provide recommendations on the design and execution of the works.

243. The four pilot affordable schemes proposed as suitable for communities are:

- *earthen trenches*, formed by excavating material to enlarge a natural or manmade depression (of the order of 40 m x 25 m) which is recharged by rainfall from the watershed. The pond would be fenced to control access and the margins planted to reduce siltation. Estimated investment cost USD 23,625. Water would be lifted by hand into animal drinking troughs or for application to vegetables. Fish farming would be possible if the community chose to retain a minimum water level in the pond throughout the year and undertook to prevent pollution by inorganic agrochemicals from the catchment area;
- *stand-alone run-off capture structures*, comprising small and micro retaining dams (50 m x 50 m) to impound fresh and used surface water including excess/flood waters in extreme rainfall events. Estimated investment cost USD 49,875. These structures can be realized with homogeneous or heterogeneous land depending on the availability of materials, with riprap, gabions, cement masonry, concrete weight or reinforced concrete. The advantage of structures above the fall-line is the possibility of withdrawing water by gravity by pipe through the dam;
- *incorporated run-off capture structures*. There may be opportunities to add water capture infrastructure to *Nema's* planned water management investments in the uplands to slow surface run-off and manage flood events, which are essential in the practice of sustainable land management to collect the sediment carried by the water, to enrich the environment of crops and to increase ground water retention. Currently, the standard *Nema* surface water management structures are designed to optimise the use of rainwater and minimize flood damage at a watershed level, but not to impound excess water for use in the dry season. On a case-by-case basis, the project would consider broadening the scope of planned water management schemes to incorporate a structure (25 m x 40 m) to impound some of the water draining from the watershed. Estimated investment cost USD 30,975; and
- *barrage saline water barriers*. *Chosso* would revive a tried and tested technology to prevent brackish water pushing ever-further upstream in tributaries flowing into the saline lower reaches and estuary of the River Gambia and thereby increase the availability of usable water to nearby communities. The appropriate structure is a low concrete "bridge barrage" with an impermeable skirt extending below the surface located strategically to prevent the incursion of saline water and impound a relatively small volume of water (maximum 800 m³) behind the barrage to the level of the spillway. Estimated investment cost USD 10,500.

244. Two further possibilities have been considered but not pursued in this design as being technically feasible but too large, complicated and costly for community ownership and operation:

- *concrete dam structures*, at a larger scale than needed by an individual community, with an initial estimated cost of USD 1 million for a dam of 5 m height retaining 50,000 m³ of water, and a minimum annual maintenance cost of USD 18,600; and

- *stream capture structures*. There are perennial and seasonal streams that flow into the River Gambia, the majority originating in Senegal, with those entering the main system above the saline boundary contributing to the volume available for use. Despite the relatively flat terrain and topography, there is potential for diverting streams into a cascade of low retaining structures for the productive use by nearby downstream communities without the need for pumping. As with the incorporated run-off capture structures, stream capture structures would have the merit of greater certainty of supply than the stand-alone earthen trenches and run-off capture structures.

245. Chosso will support those schemes demonstrating the best benefit-cost ratios. In the context of piloting community water harvesting techniques for The Gambia, the project would support GoTG in implementing at least one of each of the four approaches outlined above. However, it is expected that the stand-alone schemes will predominate on a micro-project basis, with a community contribution of 5-10% of the investment cost, (except for barrage structures). In all cases, the project will bear the full cost of site identification, design and supervision. For budgeting purposes, a nominal schedule of 24 Community water harvesting structures is proposed: 10 earthen trenches, 4 stand-alone run-off capture structures, 4 incorporated run-off capture structures and 6 barrage saline water barriers.

246. At the programme level, the anticipated benefits from these pilot *Community water harvesting* schemes would be: increased availability of water through the long dry season for 24 farming communities, (nominal 1,800 ha of productive land); social capital built up through the collective action of WUGs; and physical community assets created.

1.3 Village vegetable schemes (USD 0.11 million).

1.3.1 Climate-proofing *kafo* women vegetable schemes (M – USD 0.07 million, 1.4%).

247. The imperative to be economical with groundwater on village vegetable schemes, in view of increasing water stress and demand, points to a modification of the pumping and water distribution system design of *Nema*, with an additional initial cost offset by reduced labour requirements under operation. The aim is an uncomplicated system that delivers just enough water to the growing crops with the least effort. The minor modifications for the upgrading of 14 existing *kafo* women vegetable schemes relate to solar pumping systems and improved water distribution methods.

248. It is proposed to avoid water shortages in the gardens by boosting the installed capacity of the pumps with increased solar panel surfaces and by installing accumulation batteries to store energy during the hours when the sun is present, thereby permitting irrigation at night and through periods of cloudiness. Irrigation at night saves water as the plants do not sweat during this period. It is possible that cloudiness will increase with climate variations.

249. For a more efficient and labour-saving water distribution system, it is proposed to replace the existing storage basins with gate valves. The basins have water surfaces that are likely to be subject to evaporation increases with higher maximum temperatures. With the gate valve system, the water is not stored but taken directly for use at the plot. Chosso would also equip the gardens with spray tubes to reduce the hand-carrying of water by women over sometimes significant distances within the plots.

250. Agroforestry techniques are proposed to reduce water losses further, including the planting of windbreaks along boundaries and at 100 m intervals in the gardens, and the use of organic matter in the soil as well as mulching to retain moisture.

251. The project would promote the purposeful management of scarce irrigation water to ensure its optimal use by the *kafo* women vegetable growers. Key activities would comprise training on the operation and management of the irrigation infrastructure as well as group and organizational capacity building.

1.3.2 Climate-proofing youth vegetable schemes (M – USD 0.04 million, 0.8%).

252. As for the *kafo* women schemes, it is essential that groundwater be used sparingly and efficiently on eight new rural youth vegetable schemes. It is proposed to modify the design of the solar pumping system in the same way and for the same reasons.

253. With the advantages of a new build and the prospect of more intensive production modalities on the youth schemes, the project would install “microjet” irrigation equipment at the new sites. This is a form of irrigation that is close to the drip irrigation system but uses localized spraying. Drip with sheath is not recommended, as it requires much maintenance (filters that must be cleaned constantly), there is a lack of customer service support in the country and there are chronic difficulties sourcing the required soluble fertilizers.

254. The project will aim at the efficient management of the irrigation water by youths, who hitherto may have had relatively little experience in vegetable production. Key activities will comprise training on the use of the microjet irrigation technique, choice of crops, sequencing of planting in line with market demand, and the management of the water infrastructure, as well as group and organizational capacity building.

1.5 Community forest restitution (USD 1.74 million).

255. The aim of this new *Nema* subcomponent is to enhance the protection and stabilization of watersheds, which are exposed to increasing risks of extreme climate events, whilst providing livelihood adaptation security to communities from planting and management of indigenous and economic trees¹¹ and the restoration of mangroves. *Chosso* would provide incentives for communities gradually to regenerate their degrading ecosystems. A great deal of damage has been done to the landscape over recent decades, exceeding the rate of natural regeneration of the flora and fauna in the commons. The project would promote a rigorous programme of forest restitution combining the strategic replanting of appropriate varieties within watersheds with robust management arrangements to protect the shared natural resources and ecosystems in the public domain.

256. The direct economic benefits to vulnerable communities anticipated from the planned *Chosso* agroforestry, woodlot and mangrove interventions include the increased production of timber, fuelwood, fish and oysters, fodder, herbs, honey, fruit and nuts. The communities will also benefit from increased provision of ecosystem services from the restituted watersheds.

257. However, the reversal of the long-term decline in the economic carrying capacity of the finite fragile natural resource base, as evidenced by the rapid disappearance of forest cover and declining on-farm yields, is of greater significance in sustaining incomes in the future

¹¹ These include but are not limited to Moringa, Gmelina, Tingo (*Elacis guincensis*), Netto (*Parkia biglobosa*), Lenko (*Afzelia Africana*), Bungkongo (*Bombax costatum*), Faiderhbaalbida, Santango (*Daniella Aliverii*), eucalyptus and cashew.

and combating the negative effects of climate change. Indirect and medium-term returns to investments would include:

- physical community assets created;
- greater energy security;
- increased rainwater infiltration with associated effects on groundwater levels;
- reduced soil erosion (enhancing soil quality) and river sedimentation;
- increased volumes of aquatic life and dependent species;
- shade and windbreaks; and
- protected river margins in perennially and seasonally saline areas.

258. The three discrete *Chosso* activities under *1.5 Community forest restitution* are classified as enhancements to the *Nema* design, namely: *1.5.1 Community agroforestry*; *1.5.2 Community woodlots*; and *1.5.3 Mangrove restoration*, as follow. All investments in reforestation, woodlots and mangrove would be in line with community priorities, plans and commitments. These three elements combined make up one third of the total estimated project cost.

1.5.1 Community agroforestry (E – USD 0.29 million, 5.9%).

259. This substantial intervention is in direct response to the drive for greater climate change resilience for smallholders, namely, halting and reversing the present rate of loss of tree cover around settlements, in agricultural lands and within the watershed. The extent and speed of the deterioration of the forest cover and the quality of the exposed topsoil within living memory is a matter of huge concern, described as “alarming” in NBR and URR.

260. Climate change is compounding the factors contributing to the declining economic carrying capacity of the productive land available to an increasing rural population. Profitable farming will not be an option for many of the children of the present farmers unless a concerted and sustained investment programme is undertaken to restore the natural landscape. Trees are central to arresting and reversing the steeply declining trend.

261. The emphasis of the *Community agroforestry* initiative is on the planting of indigenous species that are more climate resilient and the replacement of slow-growing trees that have been cut down, such as baobab, whilst providing alternative livelihood diversification options to the communities. Tree planting in watersheds (reforestation) would begin to restore the original forest cover in the vicinity of beneficiary communities, primarily to stabilise soils and slow down rainwater run-off. In the buffer zones, (areas between the uplands and lowlands), the re-vegetation would contribute to reducing the rate of degradation of the lowland landscapes and maintaining upland productivity. Around settlements, trees would have multiple additional amenity value including shade, fruit and nuts, windbreaks and privacy.

262. Aside from budgetary constraints, reported in-country experience of such initiatives has been dominated by the challenges of sourcing appropriate viable planting materials and providing the care and protection of seedlings through the first two years, particularly against prolonged dry spells, drought and browsing animals. *Chosso* would promote community-driven initiatives with the technical support of the Forestry Department rather than the other way around. The strong advice offered by one senior local expert consulted is:

- to concentrate on collecting and planting seeds from the immediate area rather than bringing in seedlings with poor survival rates, (long transportation periods also

adversely affect survival rates as evidenced by the SLMP experience where as much as 50% was lost for some species transferred); and

- to devise and implement a robust natural resource management plan based on the commitment and mandate of the community. Proper management of re-vegetated areas will reduce the pressure on existing indigenous forests, allowing for enhanced natural regeneration.

263. Chosso would respond to requests from communities planning to reconstitute a total of 500 ha of depleted forests close to settlements and in the “buffer zone” between the uplands and lowlands in those parts of the country adjudged most vulnerable to climate change. The aims would be to consolidate water control infrastructure, to re-establish continuous patches of mainly secondary woodland, and to encourage the process of recovery of the environment to the state prior to over-exploitation by the human population. The learning curve in rice growing communities, particularly from projects such as PIWAMP where the links between upland and lowland degradation were strongly illustrated, points to increased appreciation of the role of vegetated buffer zones. This experience will provide further incentives for communities to maintain the secondary woodlands.

264. The intervention would build on country experience with a three step approach comprising: the establishment of a functional forest management institution in a participating community; surveys, mapping and the development of a management plan for a designated area; and multi-year tree planting and protection activities. The investment cost is estimated at USD 585/ha.

1.5.2 Community woodlots (E – USD 0.25 million, 5.0%).

265. Woodlots have been created in The Gambia since the 1980s as important sources of fuelwood, timber, grazing land, windbreaks and improved soil nutrients, *inter alia*. The Forestry Department scaled up the activity with the coming of PIWAMP, establishing an estimated 119 ha of community-managed woodlots between 2007-10, and continued implementation under the follow-on Sustainable Land Management Project.

266. The key lesson learned from this recent experience has been the necessity for strong local management of the establishment and operation of woodlots, driven by the communities’ observation and understanding of substantial real benefits in addressing natural resource degradation and increasing community wealth, with the involvement and assistance of external organizations being wholly in response to demand.

267. In line with requests emanating from watershed management plans, the project would establish 75 ha of community woodlots based on the approach and methodology of the well-established programme of the Forestry Department. The estimated budget to establish a 1 ha woodlot is USD 3,300, including USD 2,000 for the essential security fence.

268. The model emphasises the financial and environmental sustainability of each woodlot, founded on sound management by the communities themselves. As with *Community agroforestry*, the project would target local initiatives in locations where the natural environment is under greater stress and vulnerable to additional challenges from a deteriorating climate. Although feasible throughout the country, the need for additional income from non-agricultural activities is most pressing for communities with increasing population pressures on finite natural resources, in particular in CRR South and CRR North.

269. Interested parties would be assisted in devising a robust plan for both implementation and, crucially, the future operation and maintenance of each woodlot. Successful examples

in The Gambia have focused on timber production rather than fuelwood or other purposes, and so have had to be flexible in tending to and policing the maturing trees over several years prior to harvesting and replacement. Best practice now avoids reliance on a single species in a stand of trees, in line with the drive for biodiversity and a measure of insurance against unforeseen hazards including changing patterns of pests and diseases as temperatures increase. Notwithstanding the attractions of faster-growing exotic species, the selection of suitable varieties should be driven by the quality required for the proposed use of the output and careful observation of which trees are thriving in the immediate area.

270. Whilst *Chosso* can support the establishment of woodlots with financial resources and technical advice, strong community ownership and commitment have been shown repeatedly to be the key ingredients in successful initiatives, including a full part played by women in both management and operations.

1.5.3 Mangrove restoration (E – USD 1.20 million, 24.2%)

271. Mangroves are of vital importance to the biodiversity of the country's natural environment. Mangrove forests are aqua-plant communities that are part of a larger ecosystem that typically includes mudflats, tidal marshes, salt barrens, coastal forests and freshwater wetlands, freshwater streams and rivers. They are critical habitats for many species of fish and wildlife, serving as fish and shellfish nurseries and producing large quantities of leaf material that becomes the basis for a detritus food web. Once established, they can serve as sources of livelihood for the riverine communities, provide physical protection from storms and floods, and help to remove pollutants before they enter adjacent coastal waters.

272. Mangroves contribute directly to inland fishing, a very important source of both protein and employment for the riverine communities, as the breeding habitat for the majority of the fish species. However, mangroves have been massively depleted in living memory by a combination of natural "die-back" (linked in some cases to hyper-salinity) and excessive exploitation and clearance for unsustainable rice production and fuelwood.

273. The indicated remedies are, at a scale commensurate with the problem: to widen the mangrove belt; to replant mangroves in the context of a community resource management plan; and to ensure that infrastructure built along the mangrove belt and upstream on tributaries pays due regard to the tidal flow requirements of the mangrove ecosystems.

274. In parallel with the two community-driven tree-planting programmes, *Chosso* would promote mangrove restoration as both a productive resource and an important element in river management. Healthy mangroves are key to the saline-fresh water balance in the complex River Gambia system, important habitats for wildlife and a significant contributor to livelihoods. Mangroves offer a natural protection against saline water intrusion and are a particularly important source of livelihoods for women in areas with saline soils as providers of protein (fish and oysters), wood (fuel and construction) and honey.

275. The project would undertake 600 ha of systematic replanting and consolidation of mangroves in the lower reaches of the River Gambia (WCR, LRR and NBR), particularly in areas adjacent to lowland water control structures installed by *Nema*. The estimated cost of a high quality job is USD 2,600/ha. As with the tree planting activities, *Chosso* would work with and through interested communities along the bank for whom fishing is a major source of income.

276. The mangrove restoration technology is well-understood from the iterative experience gained by recent pilot schemes led by the Forestry Department, including 20 ha in five sites restored in partnership with the West African Mangrove Initiative (2008-11) and 72 ha along Bintang Bolong with the Canary Current Large Marine Ecosystem (2012-14) as well as other projects including the Gambia-Senegal Sustainable Fisheries Project (USAID/West Africa Regional Mission) and the Coastal Resilience Project supported by UNEP, GEF and UNDP. In all these cases, the local fishermen have been highly motivated by evidence of the rapid reestablishment of oysters in the newly planted mangrove, the replenishment of fish stocks in the immediate vicinity, and even the return of crocodiles after years of absence. Committed communities have been prepared to deal with minor conflicts with other river users, such as livestock keepers, during implementation and to contribute labour as a significant proportion of the overall cost in kind.

277. In addition to contributing to flood protection and livelihoods, mangrove restoration generates several valuable ecological benefits, including carbon sequestration, nutrient retention, sediment retention, biodiversity habitat, flood attenuation, wastewater treatment, water supply and recharge. It is noted that the provisioning impacts on women's livelihoods and vulnerability levels should be monitored in order to make the case for further investments in mangrove protection. Recent studies¹² on mangrove in the country provide evidence of the importance and multiple benefits of mangrove.

Component 2: Agricultural commercialization (USD 0.42 million)

2.1 Producer organizations (USD 0.07 million).

2.1.1 Climate resilience for producers (E – USD 0.07 million, 1.4%).

278. The project would seek to extend adaptation “best practice” to smallholders in response to increased climate variability and change, both on-farm and in the sustainable use of natural resources within the watershed. The practices to be promoted would include: the selection of varieties that are drought, salt or flood tolerant based on the location; integrated pest management linked to temperature increases and the promotion of organic manure; ensuring the sustainable use of inorganic fertilizers; crop rotation and diversification; the use of half-moons; and planting in basins or mulching.

279. An appropriate production adaptation curriculum and tools package would be developed with the extension services and other MoA technical staff with expertise in climate change adaptation options.

280. The climate change adaptation knowledge and skills would then be conveyed to 1,200 farmers through the tried and tested Farmer Field School channel, so that producer organizations can have better access to, and make informed decision about, climate change risk vis-à-vis their farming activities. In addition, the Functional Literacy Programme would be used to provide an effective forum for climate and weather messages to be tailored to the needs of farming households and enhance the readiness of the information for their use.

¹² Support to fisheries in Bao Bolong and Tanbi wetlands: baseline income status of beneficiaries communities report, December 2014; Study to assess mangrove die-back: causes of mangrove die-back in The Gambia report, November 2014; Study on the identification and trialling of climate-resilient alternative livelihoods report, August 2014; Study to assess Mangrove Die-back: review of mangrove die-back and forest decline in The Gambia, November 2014; Strategic Implementation Plan for Mangrove Restoration, January 2015 as these documents are from the “Enhancing resilience of vulnerable coastal areas and communities to Climate Change Project (GEF/UNDP).”

2.3 Technical support services (USD 0.35 million).

2.3.1 Capacity building of technical service providers (M – USD 0.08 million, 1.6%).

281. The project would respond to the perceived weakness of the emergent but inexperienced local works-contracting cadre by offering generic commercial and managerial advice through two technical workshops and by providing mobilisation and implementation support for successful bidders. This action will reinforce a major existing *Nema* intervention and make service providers more efficient, thereby ensuring contract completion as well as more climate proofing of infrastructure. The programme will target Gambian private sector service providers, particularly local contractors on aspects of task planning, management and contract execution.

2.3.2 Climate risk information services (E – USD 0.07 million, 1.5%).

282. Farmers depend on a variety of sources for weather information, including radios and community networks, but pertinent information is often received too late to inform planting decisions. Farmers need reliable advice on likely start and end dates for the rains as well as seasonal forecasts. By default, most smallholders plant early and use early maturing varieties in response to erratic rainfall. However, this strategy results in an inefficient use of their scarce resources, such as seeds, as dry spells occur and smallholders have to plant again.

283. Weather information is provided by the Department of Meteorological Services (DMS), which undertakes analysis at a central level. Regional- and district-level monitoring and forecasting capacity is negligible. Data collection at the local level is also limited and interaction between the providers and end-users of the information is non-existent.

284. *Chosso* would consolidate the timely generation and dissemination of key weather and climate risk information to smallholders at the local level in an appropriate user-friendly format. The project would finance the strengthening of a GIS-based information gathering, analysis, forecasting and dissemination system in the Climate Services Division of the Department of Water Resources (DWR). At the centre, the upgrading and operation of the GIS Unit in DWR would be supported with sufficiently powerful computer hardware and software for climate modelling and with appropriate technical training in its use. The scope of this activity would be refined further to ensure complementarity with the second phase of the Least Developed Countries Fund (LDCF) project on Early Warning, which was launched in April 2015 and will be implemented by UNEP and UNDP, covering 14 sites.

285. Extension workers would be trained in the basic collection and analysis of data and be engaged in devising the most appropriate packaging and dissemination methodologies. The field staff would be equipped with the relevant tools for the dissemination of the information to about 100 communities over the life of the project. Methods such as the use of mobile phones (SMS or voice messages) and radio listening groups would be explored. The engagement of the farmers as end-users of the information and the agricultural extension staff to develop the package of climate information according to needs will be a further step in developing a national framework on climate services, (using the guidelines of the Global Framework on Climate Services).

2.3.3 Hydrological information services (E – USD 0.20 million, 4.0%).

286. In parallel with the initiatives on climate change modelling and weather forecasting services for smallholders, *Chosso* would support hydrological data collection, analysis and

modelling in the public sector to inform the mainstreaming of climate change adaptation within the country. This activity would contribute to the recently developed national hydrological monitoring network. In particular, the technicians would concentrate on the observed and predicted changes in the behaviour of the River Gambia and its watershed both within and beyond national boundaries, particularly in the context of the demand for irrigation water from the river and its tributaries.

287. The salinization of formerly productive fields and the advance of the saline front present several challenges to smallholders. This activity will be aimed at understanding the interactions and impacts of the changing climate on the hydrological system including the water and salinization control measures such as dikes that are being constructed. The results will inform the design of tidal irrigation schemes and other lowland developments.

288. Hydrometric equipment would be provided for the Hydrology Unit to perform real-time monitoring, including quantitative and qualitative measuring gauges at strategic locations along The River Gambia and its tributaries. Technicians would be trained in the use of the equipment and in the analysis of the expanded database. The aim is a fully functioning hydrological information service within the country to make key information for the development of the water available to users.

3. Project facilitation (USD 0.81 million)

3.1 Project management and implementation support (USD 0.35 million).

3.1.1 Climate change management capacity (E – USD 0.35 million, 7.1%).

289. The project support and management capacity of *Nema* would be strengthened with the addition of two full-time specialists, a Climate Change Adaptation Officer (CCAO) and a Climate Change Adaptation Assistant (CCAA), as “champions” of the *Chosso* campaign for climate change adaptation in the country. Working from the established PSU, the additional staff would have appropriate mobility support, computing and communications facilities, and access to technical skills development courses.

290. Specialist international technical assistance would be made available as required to support management with the mainstreaming of climate change adaptation into *Nema* implementation and the public service. Some of the initially identified needs for the TA include the GIS analytical capacity and the development of both the National Framework on Climate Services and products targeted at smallholders farmers.

3.2 Knowledge management, monitoring & evaluation (USD 0.46 million).

3.2.1 Resilience research and climate policy dialogue (E – USD 0.46 million, 9.4%).

291. *Nema*'s robust PME framework would be enhanced with respect to the mainstreaming of climate change adaptation with the conduct of a supplementary baseline survey, concentrated impact surveys and the adoption of IFAD's standard Social, Environmental & Climate Assessment Procedures (SECAP). The application of the SECAP will entail an update of the Environment & Social Management Plan developed for *Nema* and enhanced monitoring of natural resource management using tools such as GIS.

292. Research will be conducted into the specific predicted impact of climate change on the Gambian rural population to inform policy and the most cost-effective adaptation responses whilst leveraging existing processes to enhance policy dialogue with a focus on mainstreaming the livelihood resilience options of the smallholder.

293. About eight knowledge products will be developed under the *Chosso* on selected topics such as:

- comparison studies for the enhanced infrastructure, which will also enable cost estimation for the modification of infrastructure to withstand climate risks;
- community-based adaptation techniques;
- the development of manuals for watershed management in collaboration with SWMS;
- the enhanced standards for infrastructure design, (also with SWMS); and
- the mangrove restoration interface with salinity and dike design and installation.

294. The manuals and enhanced infrastructure design standards to be produced will also influence related policies. Other policy level interventions and dialogue opportunities will be identified for climate change mainstreaming, including ten inclusive national climate change response events and purposeful regional networking to learn from the experience of countries facing similar challenges. *Chosso* will support the effective operation of the National Climate Committee through the establishment of a functional secretariat and streamlining of the core membership, including its roles and responsibilities under the umbrella of the Agriculture and Natural Resources Working Group.

295. *Chosso* would assist the Directorate of Development Planning of MoFEA with the development of effective approaches and methodologies for planning and budgeting for climate change adaptation throughout government service and the wider economy.

296. *Chosso* will support the development of the Global Framework for Climate Services (GFCS), which adds the energy and transport sectors to the four priority sectors of agriculture and food security, water, health and disaster risk management according to the guidelines of the WMO. The Framework is an essential step that precedes the development of climate service packages for the smallholder farmers that *Chosso* will finance with the required dissemination. It will have a strong emphasis on user involvement and capacity development as well as the engagement of all partners to maximise benefits for all users. The GFCS is aimed at reducing the vulnerability of society to climate-related hazards and advancing the key global development goals through better provision of climate information.

Appendix 5: Institutional aspects and implementation arrangements

Institutional aspects

297. Institutional involvement in *Chosso* will span both the public and private sectors engaged in climate change related activities. In the public sector, it will cut across the Ministries of Agriculture (MoA); Environment, Climate Change, Water, Parks and Wildlife (MoECCWPW); the Office of the President (OP), which has responsibility for forestry matters; and the Ministry of Finance, responsible for the national budget which also serves as the Focal Point for the Green Climate Fund. The institutions are further linked through two coordinating bodies: the Agriculture and Natural Resources Working Group (ANR-WG), which is a policy making body housed at the National Environment Agency; and the National Climate Committee (NCC), a technical working group at the Department of Water Resources.

298. The implementation of *Chosso* is contributory to the National Adaptation Programme of Action (NAPA) through the climate-proofing of infrastructure, supporting adaptive water extraction and distribution systems for both surface and underground water sources, promotion of adaptable crop varieties (rice and vegetables) and conservation agriculture in the uplands.

299. *Chosso* will build on the community mapping and GIS of *Nema* which hitherto focused on natural resources and which will now be expanded to cover climate hazard and vulnerability mapping. As an integral element of the *bantaba* watershed planning process, capacity in GIS-based climate risk analysis, particularly the climate change scenario and modelling, will be enhanced in key institutions such as the NEA.

300. The legal provisions and policy pronouncements on women's equitable access to land have been operational in theory since 2010 but are yet to be implemented fully because of social and cultural barriers that are rooted in the 'power relations' status quo. Access to land for vegetable production is essential if women are to invest in their businesses. Careful handling of this issue with women's groups and capacity development of *Nema* staff would be undertaken by and through the gender structures in GoTG.

Project implementing arrangements

301. MoA and MoECCWPW will jointly be the Executing Agency (EA) for *Chosso*, with CPCU tasked with overall coordination in line with arrangements for similar projects. IFAD will supervise the project directly, with each supervision mission comprising the CPM and consultants according to required expertise as identified by the project staff.

302. **Project Steering Committee (PSC).** The Project Steering Committee of *Nema*, a key decision-making body that provides policy guidance, reviews and approves implementation progress, and generates Annual Work Plans and Budgets (AWPB) including procurement plans, will ensure that the *Chosso* remains on course to deliver on project outputs to meet the outcomes defined in the PDR. PSC meetings and consultations/deliberations related to *Chosso* will be co-chaired by MoA and MoECCWPW in order to strengthen further the mainstreaming of climate change in the implementation of *Nema*. As a result, the composition of the existing *Nema* PSC will be expanded to include:

- the Chair of the National Climate Committee (NCC), the National Focal Point for climate change at the Department of Water Resources of the Ministry of Environment, Climate Change, Water and Wildlife (MoECCWPW); and
- the National Focal Point of the Green Climate Fund at the Directorate of Budget in the Ministry of Finance and Economic Affairs (MoFEA).

303. **Central Project Coordination Unit.** As is the case for other projects, the Central Project Coordination Unit will provide overall coordination of *Chosso*. CPCU will also be involved in the planning and conduct of supervision missions to ensure the efficient implementation of sector projects.

304. **Project Support Unit.** The PSU, charged with the day-to-day implementation of *Nema*, will continue to be lean¹³ but will be expanded to include a Climate Change Adaptation Officer and a Climate Change Adaptation Assistant, (draft ToRs attached), who will spearhead the mainstreaming of climate change adaptation in *Nema*. The MoA, through CPCU, will facilitate and coordinate the recruitment of the additional staff in close consultation with IFAD. As is the case for *Nema* staff, the CCAO and CCAA will be subject to an annual performance review.

305. The *Chosso* will be mainstreamed into the PSU of *Nema* charged with its day-to-day implementation and whose execution is vested in the MoA but in close collaboration with MoECCWPW on specific *Chosso* issues. The overall coordination of *Nema* will continue to be provided by the CPCU. *Nema*'s strategy of implementation through service providers including those under the MoECCWPW and coordination by RADs at regional level will continue.

306. **Implementing agencies and producer groups.** The project is building functional linkages between institutions to improve access to available climate risk information and know-how/technologies that are relevant to mitigating environmental and climatic risks in agricultural systems. The *Chosso* will adopt the *Nema* approach of implementation through qualified and competent service providers from both the public and private sectors. Service providers will enter into performance contracts with the project, with supervision and monitoring led by local communities and beneficiaries.

307. **Strategic partnerships.** The collaborative *Chosso* design seeks partnerships with other UN agencies and sources of climate and environmental finance and linkages with other adaptation-related projects and national disaster risk management initiatives.

Detailed implementation arrangement of component activities

Component 1: Watershed Development

1.1 Communal/bantaba watershed planning

1.1.1 **Community adaptation management capacity (E).** The sensitization campaign will be conducted by the Department of Community Development (DCD) who will collaborate with resource persons on climate change and the mass media including the Communication, Education and Extension Services (CEES) of the DoA. DCD will enter into a performance-based Memorandum of Understanding (MoU) with *Chosso* for its services.

¹³ Comprising Project Director, Financial Controller, Accountant and Assistant, Administrative Assistant, Upland and Lowland Coordinators, Planning, Monitoring and Evaluation Officer, Knowledge Management and Communication Officer, Business Development Service Officer and 20 Community Field Assistants.

The *bantaba* watershed planning will be implemented by the Department of Community Development who would develop a locally-appropriate climate change adaptation curriculum and training tools, conduct Training of Trainer (ToT) sessions for 42 existing Multidisciplinary Facilitation Teams (MDFTs) across the country, and then promote step-down training in adaptation approaches and techniques for 120 interested communities to be carried out by the MDFTs. The selection of communities will be informed by the climate vulnerability assessment in the baseline study to be undertaken.

1.2 Water Management for rice cultivation

1.2.1 Tidal Irrigation scheme design adaptation. Competent service providers will be hired to do the design and supervision of the tidal scheme adaptations. Subsequently, construction firms will be tasked with execution of the canal lining works.

The institution building of Water User Groups (WUGs) on management/monitoring and operational capacity will be conducted by DoA or other competent service providers. In the event of DoA, a performance based MoU will be entered into with *Chosso* for the activity. WUGs will be provided with kits for monitoring salinity and will be trained on their use by the supplier in close collaboration with the Hydrology Division of the Department of Water Resources (DWR).

1.2.2 Lowland Water Control Infrastructure adaptation. *Chosso* will recruit competent service providers to design the modifications of the structures (dikes, bridges, spillways and related water structures) and to recommend appropriate materials. Subsequently, contractors will be tasked with construction and execution of the works. The latter will have materials tested at the laboratory of the Gambia Roads Authority at the Ministry of Works.

1.2.2 Upland Water Control Infrastructure Adaptation. Qualified contractors will be hired for the construction and will be required to test construction materials. Competent service providers will be tasked to conduct a study of the topography of the terrain to optimize the creation of run-off capture. These studies will help rationalize water control infrastructure design and implementation.

1.2.5 Community Watershed harvesting. *Chosso* will hire qualified service providers to conduct a site assessment and feasibility study that will determine hydrological, topographical and geotechnical attributes of the proposed water harvesting structures. Based on the study results, competent service providers will be tasked with the design and supervision. Subsequent to this, contractors will be hired to execute the works. Concrete and base materials will be tested for strength by the contractors using the laboratory at NRA.

1.3 Village vegetable schemes

1.3.1 Climate-proofing kafo women vegetable schemes. A number of modifications aimed at improving water use efficiency will be made including replacing the existing basins with gate valves, increasing solar panel surfaces, installing batteries and providing water hoses. These modifications will be budgeted by *Chosso* with supply, installation and training by competent service providers.

The promotion of agroforestry techniques such as planting of windbreaks and the use of organic manure and mulching will be provided by the National Agricultural Research Institute. Training on the management and operation of irrigation infrastructure will be done by the contractors in charge of the water distribution. Subsequent group management training will be conducted by Horticultural Technical Services (HTS) of DoA.

1.3.2 Climate proofing youth vegetable schemes. Training on microjet irrigation will be done by the supplier and installer of the systems. The subsequent training on choice of crops, staggering of crops and other Good Agricultural Practices (GAP) as well as the management of the infrastructure will be implemented by Horticultural Services Unit of DoA in collaboration with the Regional Agricultural Directorates.

1.5 Community Forest Restitution

1.5.1 Community agroforestry. Under this subcomponent, community forestry initiatives will be promoted with the technical support of the Department of Forestry. These will entail institution building as well as the establishment and management of community nurseries. Related activities such as monitoring, surveys, mapping and the preparation of management plans will also be provided by the Department of Forestry who will sign an MoU with *Chosso* and be provided with operational support (monitoring and supervision).

1.5.2 Community woodlots. This will target local initiatives in degraded environments with the technical support of the Department of Forestry entailing training on management of trees, nursery management and fire belting. The operational costs comprising monitoring and supervision will be borne by *Chosso* and executed through an MoU.

1.5.3 Mangrove restoration. *Chosso* will support communities with planting materials and their transportation to the sites. The Department of Forestry will provide technical support in the establishment and management of mangroves and be tasked with monitoring and supervision (operational costs), the cost of which will be borne by *Chosso* and executed through a performance-based MoU.

2. Agricultural commercialization

2.1 Producer Organizations

2.1.1 Climate resilience for producers. NARI will provide support to extend the adaptation “best practices” to smallholders both on farm and in the sustainable use of natural resources. NARI would enter into a performance based MoU with *Chosso*. Appropriate production adaptation curriculum and tool packages will be developed by competent service providers together with the extension services and other MoA/MoECCWPW technical staff with expertise in climate change adaptation options.

2.3 Technical support services

2.3.1 Capacity building of technical services. Qualified service providers will be contracted to offer generic commercial and managerial advice to start-up contractors through two technical workshops. Mobilization and implementation support will be provided to the Engineers Association.

2.3.2 Climate risk information services. The Climate Services Division of the DWR will enter an MoU with *Chosso* to train extension workers in the basic collection and analysis of climate data and in the devising of the most appropriate formats and packaging techniques. The trained field staff will subsequently be equipped with tools for the dissemination.

2.3.3 Hydrological information services. The Hydrology Unit of the DWR will be supported by *Chosso* with data collection equipment and analysis skills to perform real time monitoring of water flow, salinity and other parameters along the River Gambia. Service providers will be contracted to supply and install the equipment and to train technicians on its operation and management.

3. Project Facilitation

3.1 *Project management and implementation*

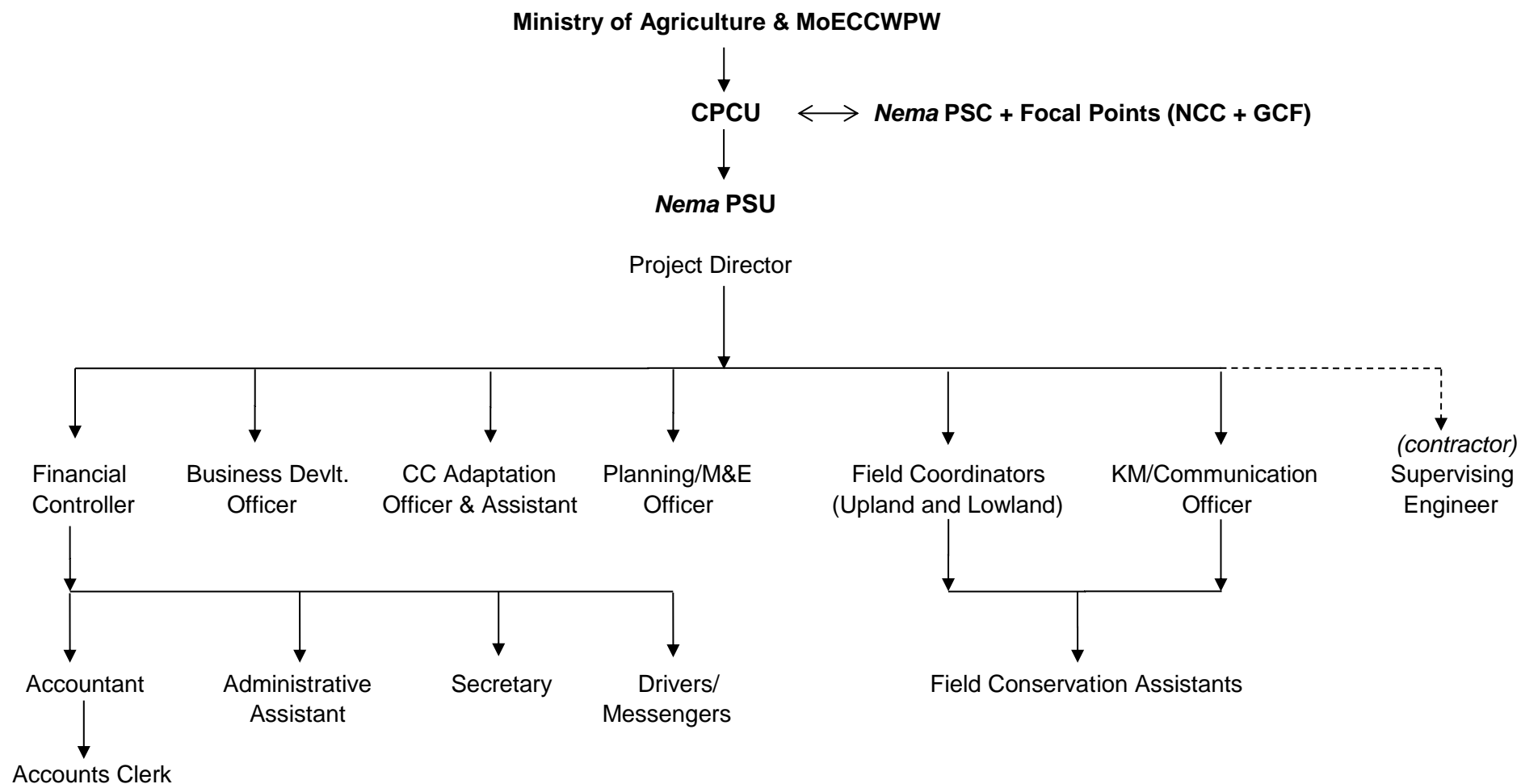
3.1.1 Climate change management capacity. The project will hire a full-time Climate Change Adaptation Officer (CCAO) and a Climate Change Adaptation Assistant (CCAA). Under *Chosso*, the PSU will be supported through TA, principally a Climate Change Adaptation Specialist. The additional staff will be provided with mobility, communications and other relevant operational support.

3.2 *Knowledge management, monitoring and evaluation*

3.2.1 Resilience research and climate policy dialogue. *Chosso* will hire qualified service providers to conduct a supplementary baseline survey and enter into an MoU with the National Environment Agency to update the *Nema* Environmental Social Management Plan (ESMP) to the Social, Environmental and Climate assessment Procedures (SECAP) required by IFAD.

Research on the specific knowledge products relating to the impacts of climate change on the rural population will inform policy, enhance policy dialogue and promote the mainstreaming of climate change. Service providers will be tasked with developing specific knowledge products. *Chosso* will support the effective operation of the National Climate Committee (NCC) with policy issues referred to the Agriculture and Natural Resources Working Group and Platform for deliberation and decision-making.

Appendix 5.1: Organizational chart



Appendix 5.2: Terms of reference for key project staff

1. Climate Change Adaptation Officer

Duration of Assignment: Up to four years following successful completion of a six-month probationary period, with renewable contracts from time to time if performance is satisfactory.

Duty Station: Based in Bakau, with regular visits to the project sites as required for monitoring, reporting and coordination.

Qualifications and Experience:

- a) A higher degree in agriculture, natural resources management, soil and water conservation or related discipline with sound knowledge of contemporary issues in climate change adaptation and environmental/natural resources management.
- b) A minimum of six years of experience in the fields of climate change adaptation or environment and natural resource management in a relevant public institution, the private sector or in an international organization, with proven skills in the management and coordination of internationally financed development programmes.
- c) The candidate would be expected to have a creative, energetic but pragmatic approach to problem solving and a thorough knowledge of the institutional setting and framework in The Gambia with specific reference to climate change adaptation; and to be familiar with all governmental and non-governmental organizations and stakeholders involved in policy dialogue and climate change adaptation at the national level.
- d) Computer literacy would be requisite and a good command of spoken and written English would be an advantage.

Job Description

The Climate Change Adaptation Officer (CCAO) would lead the work targeting various levels of climate change adaptation in *Nema*, including policy dialogue, institutional and local level capacity building and the supervision of activities to be implemented. The CCAO will be responsible for providing technical expertise in climate change adaptation within the context of the *Nema*. S/he will lead the design, development, implementation and monitoring of all the climate change adaptation activities in the *Nema*.

S/he will have the following main responsibilities.

- In close consultation with the Planning, Monitoring and Evaluation Officer, develop a framework for measuring resilience among the target beneficiaries of the *Nema* including indicators to be monitored within the programme's M&E system.
- Ensure the inclusion of climate resilience data collection in the baseline studies to be undertaken at the start of the *Chosso*.
- Liaise closely with the climate change specialists in the Department of Water Resources, Department of Meteorological Services and the National Environment Agency to ensure cross-learning, skill development and evidence bases for climate change adaptation and good agricultural practices.
- Coordinate the selection of the sites where adaptation interventions such as water harvesting and enhanced infrastructure design will be piloted in the selected regions and districts.

- Guide the incorporation of climate change adaptation measures into the design and construction of various water management infrastructures included in the *Nema*.
- Liaise with the National Climate Change Committee and engage in ongoing national and regional policy dialogue.
- Provide oversight on the development of sensitization and training materials on community-based climate change adaptation for the training of Multi-Disciplinary Facilitation Teams (MDFTs) and extension officers managing Farmer field Schools and Functional Literacy programmes.
- Provide guidance in the development of the increased efficiency of irrigation systems for the vegetable gardens.
- In collaboration with the *Nema* Knowledge Management Officer, ensure that lessons are learned, case studies are captured and identified, and knowledge products related to climate change resilience are produced.
- Participate in the recruitment process for all service providers required for the implementation of climate change adaptation related activities, including the development of specific terms of reference and preparation of detailed work plans, as well as defining and agreeing on the exact nature and timing of the deliverables with each.
- Contribute to reporting structures as laid out in the *Nema* and *Chosso* documentation and the preparation of the Annual Work Plan and Budget.
- Undertake the technical review of case studies, maps and policy papers being produced in the *Chosso*.
- Identify the appropriate dissemination channels for the case studies, vulnerability maps and other publications to be produced as part of the *Chosso*.
- Undertake any other duties, within her/his area of competence, as assigned by the Project Director.

2. Climate Change Adaptation Assistant

Duration of Assignment: Up to five years (2016-19), following successful completion of six-month probationary period, with renewable biannual contracts from time to time if performance is satisfactory.

Duty Station: Based in Bakau, with regular visits to the project sites as required for monitoring, reporting and coordination.

Qualifications and Experience:

- a) A Bachelor's degree/Diploma in agriculture, natural resources management, soil and water conservation or related discipline with sound knowledge of contemporary issues in climate change adaptation and environmental/natural resources management. At least three years working experience in a relevant public institution, private sector or in an international organization, with proven skills in monitoring and evaluation.
- b) The candidate would be expected to have good computer and progress reporting skills and be familiar with climate change adaptation issues and stakeholders. A good command of spoken and written English would be an advantage.

Job Description

The Climate Change Adaptation Assistant (CCAA) support the Climate Change Adaptation Officer (CCAO) who will coordinate and lead the activities targeting various levels of climate change adaptation activities proposed in *Chosso*.

He/She will have the following main responsibilities.

- Assist the CCAO in developing a framework for measuring resilience among the target beneficiaries of the *Nema* including indicators to be monitored within the programme's M&E system.
- Collect, collate, analyse and report on data relating to the climate resilience of *Chosso*.
- Participate in learning, skills development and evidence-based events for climate change adaptation and good agricultural practices.
- Develop the criteria for the selection of the sites where adaptation interventions such as water harvesting and enhanced infrastructure design will be piloted in the selected regions and districts.
- Undertake regular field monitoring visits and liaise with beneficiaries to ensure the incorporation of climate change adaptation measures into the design and construction of various water management infrastructures included in the *Nema*.
- Monitor and report on the training of Multi-Disciplinary Facilitation Teams (MDFTs) and extension officers managing Farmer field Schools and Functional Literacy programmes to determine incorporation of community based climate adaptation.
- Provide support for the development of the Global Framework for Climate Services led by Department of Water Resources.
- Support the development of a climate information service for smallholder farmers in close collaboration with Department for Water Resources and the Early Warning Project Phase II.

- Assist the CCAO in the development of specific terms of reference and preparation of detailed work plans, as well as defining and agreeing on the exact nature and timing of the deliverables with each technical assistant.
- Take minutes and contribute to progress reporting and documentation in *Chosso* including the preparation of the Annual Work Plan and Budget.
- Document key lessons and best practices observed and develop these into case studies and other publications to be produced as part of the *Chosso*.
- Undertake any other duties, within his/her area of competence as assigned by the Climate Change Adaptation Officer and/or Project Director.

Appendix 5.3: Capacity building plan Individual and institutional human resource development

(To be reviewed at start-up.)

Activity	Time Frame				Responsibility
	PY1	PY2	PY3	PY4	
Public Sensitization on Climate Change.	X				DCD.
Training of Trainers (MDFTs) on PRA and other participatory tools incorporating climate change.	X	X	X		Service providers.
Farmer Field Schools - incorporation of climate change best practices.	X	X	X		Service providers.
Exchange visits and study tours.	X	X	X	X	PSU.
Rain water harvesting techniques.		X	X		TA.
Climate change modelling.		X	X		NEA/DWR.
Kafo irrigation management.		X	X	X	Service providers.
Youth irrigation management.		X	X	X	Service providers.
Community forest restitution management.	X	X	X		Forestry Department
Capacity building of service providers in contract management.	X	X			Service providers.
In-service training of CCAO and CCAA.					Service providers.

Appendix 6: Planning, M&E, learning and knowledge management

Planning

308. *Chosso* will adopt planning as the first intervention as is currently practiced by *Nema* in the *bantaba* watershed planning. Climate change risk assessment and identification of adaptation responses would be integrated into the PRA methodology as an input into the village action plans and the *bantaba* planning exercises. With the Village Farmers' Associations and other appropriate structures as the entry point, sensitisations on climate change will precede all watershed adaptation planning exercises. User groups would be strengthened to manage common resources, which will become increasingly important as climate change impacts act as an additional stress in further degrading the productive land.

Results-based monitoring and evaluation

309. The *Chosso* M&E will be integrated into the *Nema* M&E framework linked to the GANAD, housed at the Planning Services Unit of MoA. Pertinent RIMS indicators will be monitored and reported alongside the existing range collected by the project. The integrated system of Planning, Monitoring and Evaluation (PME)/Integrated Knowledge Management and Communication (IKMC) will be reinforced to provide: a) timely and accurate information on implementation progress and constant feedback for decision-making and addressing potential plan deviations and problems during implementation; b) the basis for assessing the achievement of project results; and c) a platform for continuous knowledge sharing and learning activities.

310. Four of the thirteen proposed indicators for *Chosso* are impact-focused, related to savings in the burden of illness and drudgery for women (which erodes their human capital, productive potential and adaptive capacity); and provisioning benefits from mangrove and uplands trees planted and from rainfall harvesting infrastructure for low rainfall years (which would be expected to add to food security and income which increases vulnerable groups' adaptive capacity). Health impacts in rice growing areas in particular would be monitored to determine changes in the burden of illness among women, which can help to define better the adaptation response. This could be a particular issue in tidal irrigation areas that already have incidences of vector borne diseases such as malaria, given their sensitivity to changes in rainfall patterns and to night and day temperature increases.

311. The other nine intermediate climate-specific indicators measure changes in environmental and infrastructural conditions as well as expanding skills that are expected to lead to changes in adaptive capacity status. Results will be useful for GoTG in developing understanding of the types of investments that are cost effective in achieving adaptation, resilience to climate shocks and raising levels of adaptive capacity. Limited interviews with community members suggest that initiatives such as mangrove rehabilitation investments funded by the GEF SLMP project are making a difference to people's livelihoods, but quantitative data on provisioning benefits and livelihood impacts are not being collected. *Chosso* will correct this weakness and demonstrate the utility of the data for evidence-based policy dialogue.

312. The project will conduct a *Mid-Term Review* (MTR) at the mid-point of *Chosso* implementation. The MTR will determine progress being made toward the achievement of outcomes and will identify correction actions if needed. It will focus on the effectiveness, efficiency and sustainability of project implementation; will highlight issues requiring

decisions and actions; and will present initial lessons learnt on project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between IFAD and the Government and will be in line with PDR of *Chosso*

313. A *Project Completion Review* will be conducted as part of the *Nema* completion process three months prior to the closure and will be undertaken in accordance with IFAD guidelines. The PCR will focus on the delivery of the project's results as initially planned (and as corrected by the mid-term evaluation exercise, if any such correction takes place). It will review the impact and sustainability of results, including the contribution to climate resilience of smallholder beneficiaries and the capacity development of service providers.

Learning and knowledge management

314. Given the innovative nature of *Chosso*, special attention will be given to documentation and dissemination of lessons learnt and achievements. In this regard, results from the project will be disseminated and shared through the CPA and other information sharing networks and fora. Focus will be made on identifying, analysing and sharing lessons learnt that will be beneficial in the design and implementation of similar projects.

315. In addition to the augmentation of the comprehensive *Nema* M&E and KM framework with appropriate RIMS and adaptation-related indicators, the project will develop a learning agenda to assess specific questions related to smallholder adaptation and resilience, consider mechanisms of international knowledge sharing with the ASAP desk in IFAD and associated knowledge networks, and develop thematic evidence-based studies and publications on specific topics.

316. Given the limited ASAP funds, adaptation interventions in relation to the water control infrastructure will need to be made for a subset of the total *Nema* infrastructure investment. This provides IFAD with a good opportunity to fit an experimental evaluation design around the adapted and unadapted infrastructures to assess the sustainability and cost effectiveness of the additional adaptation investments. Results would be useful to GoTG for the development of infrastructure standards as well as to IFAD to inform its adaptation and programming strategies.

317. *Chosso* will promote and support policy dialogue of benefit to project implementation, particularly through lessons learnt and best practices. This will culminate in better designed structures with gradual evolution and iterative learning, for example, from manual to mechanical dikes to compacted dikes surfaced with gravel.

318. The project will build regional knowledge networks (learning routes) and feed project-related knowledge into national, international, UN and IFAD knowledge networks on climate change. As in *Nema*, knowledge services will be tailored to meet the needs, particularly of youth and women and their organizations/networks. It will draw upon the KM and communication strategy of *Nema*. Similarly, knowledge products will be packaged in and disseminated in appropriate format (radio, brochures, studies, newsletters, traditional drama, television and other social media).

Appendix 7: Financial management and disbursement arrangements

A. Financial management assessment of the project

319. **Methodology.** In accordance with IFAD guidelines, a Financial Management Assessment (FMA) has been undertaken as part of project detailed design taking into account ongoing *Nema* financial management performance. The objective of FMA is to provide further assurances that the project will be implemented in an environment with sufficiently strong financial management systems and controls in place properly to manage, control and report on project finances. The FMA involves assessing: (1) the inherent risk at country level; and (2) the project specific risk.

320. **Country context and risk rating.** The Inherent Risk is rated as High risk. The Corruption Perception Index published by Transparency International for The Gambia has deteriorated from 3.4 in 2012 to 2.9 in 2014 and the country is currently ranking as 126 out of 175. The World Bank's 2014 Doing Business ranking is still weak and even declined from 148 in 2013 to 150 in 2014. A Public Expenditures and Financial Accountability (PEFA) assessment is to be undertaken in the near future, which will allow IFAD to obtain more and up-to-date information about the current state of the country's public financial management.

321. **Project risk.** To mitigate the inherent risk, the proposed ASAP financing will be managed in accordance with the financial management arrangements already in place for the *Nema* financing. The PSU has an adequate record of accomplishment in implementing IFAD projects. In 2014, the IFAD PSU showed Moderately Satisfactory performance concerning Financial Management and the latest IFAD supervision mission assessed the project as Medium Risk. The most recent project audit reports have been received in a timely manner and have been unqualified.

322. **Anticorruption and Good Governance Framework.** In accordance with its Policy on Preventing Fraud and Corruption in its Activities and Operations, adopted by the Executive Board in December 2005, IFAD applies a zero-tolerance policy towards fraudulent, corrupt, collusive or coercive practices in projects financed through its loans and grants. 'Zero tolerance' means that IFAD will pursue all allegations falling under the scope of this Policy and if allegations are substantiated, that appropriate sanctions will be applied. Among the remedies that IFAD may apply in accordance with its General Conditions, there is the suspension and cancellation of the right for the Borrower/Recipient to request withdrawals of funds. Suspension includes the use of financing resources for ineligible expenditures and credible allegations of coercive, collusive, corrupt or fraudulent practices when the Borrower/Recipient fails to take timely appropriate actions. Cancellation includes the use when the Borrower/Recipient fails to refund amounts determined as ineligible expenditures and when IFAD determines that coercive, collusive, corrupt or fraudulent practices have been carried out and the Borrower/Recipient fails to take timely appropriate actions.

323. IFAD shall take all possible actions to protect from reprisals individuals who help reveal corrupt practices in its project or grant activities and individuals or entities subject to unfair or malicious allegations. The primary responsibility for enforcing the Policy lies with the Borrower/Recipient, and the first defence for controls shall be exercised by Project staff, Implementing Partners and Counterparts. Therefore, it is crucial that the project staff and all

stakeholders of the project are familiar with IFAD's Anticorruption Policy¹⁴ together with the national anticorruption policies and whistle blowing procedures.

324. Project specific Financial Management Assessment. As required by IFAD Financial Management assessment guidelines, the summarised scoring at design is as shown in the table below.

Table A7.1: Risk assessment at design stage

Type of risk	Initial risk	Proposed mitigation	Final risk
Inherent Risk			
1. TI Index	-	-	2.9 H
2. RSP Score	-	-	2.85 H
Control Risks			
1. Organization and Staffing. • Newly appointed Financial Controller and Accountant still untrained.	M	The Financial Controller and Accountant to be properly trained in IFAD and national procedures.	L
2. Budgeting. • Budget format and budget procedures (review and control) to be improved.	M	The format of the AWPB to be updated to take into consideration the Additional financing. The budget control procedures to be better documented in the Financial procedures manual.	L
3. Funds flow and Disbursement Arrangements.	L	Separate DAs to be opened for IFAD for the ASAP grant.	L
4. Internal Controls. • Draft financial procedures manual to be updated, and formalized.	M	Financial Procedures Manual to be updated.	L
5. Accounting Systems, Policies & Procedures. • Limited financial reporting. • Extended SoEs not in use. • Accounting procedures manual to be finalized.	M	Accounting software to be reconfigured to automate all financial reports and extended SoE format. The Accounting Procedures Manual to be updated.	L
6. Reporting and Monitoring. • Sub-optimal financial reporting.	M	Financial reports to be improved.	L
7. Internal Audit. • No internal audit function in place.	H	<i>Nema</i> to be included in the CPCU internal audit functions (to be established).	M
8. External Audit.	L	Auditor arrangements to follow current audit arrangements in place for <i>Nema</i> . When selecting the auditors, special weight should be put on the experience in auditing development projects by IFIs, AfDB and World Bank, IFAD.	L
Project fiduciary risk at design	M		L

325. Conclusion. The financial management arrangements and capacity of the existing PSU are mainly adequate to meet IFAD's requirements. As a result, the initial risk rating is currently considered as medium. After the proper implementation of the mitigation actions, the final risk rating is expected to be Low.

¹⁴ The IFAD anticorruption policy is available on the IFAD website at www.ifad.org/governance/anticorruption/index.htm. The website also provides instructions on how to report any alleged wrongdoing to the Office of Audit and Oversight, (<http://www.ifad.org/governance/anticorruption/how.htm>).

B. Financial management arrangements

326. **Proposed financial management arrangements.** The proposed FM arrangements including budgeting, accounting, internal controls, flow of funds, financial reporting, and audit arrangements will follow the FM arrangements already adopted by the *Nema* PSU with some adjustments concerning the Procedures Manual, accounting software and financial reporting in particular. The proposed FM arrangements are described below and will be outlined in detail in the updated Project Financial Procedures Manual to be approved by IFAD.

327. **Staffing.** The Financial Management unit of the *Nema* PSU consisting of a Financial Controller, an Accountant and an Accounts Clerk, reports to the Project Director (PD). The positions of the Financial Controller (FC) and the Accountant have recently been filled through a competitive recruitment process overseen by the Personnel Management Office in collaboration with MoA. Given that ASAP financing is complementing the IFAD financing and proposed enhancement in the accounting software, no additional staff will be required and thus the current Accounts Clerk for the IFAD financing will be covering the ASAP financing. The FC and the Accountant will need to receive training in IFAD FM procedures and in using the accounting software as soon as possible. In this respect, the IFAD FM E-learning and training provided by the accounting software company will be essential.

328. **Budgeting and Budget control.** Based on inputs from the stakeholders, the PSU will prepare a consolidated Annual Work Plan & Budget (AWPB) in a format acceptable to IFAD and submit it to the Project Steering Committee for approval and to IFAD for its Non-Objection at least two months before the beginning of the relevant fiscal year. The format of the AWPB will indicate at least the following: expenditure items by activity, by component, by expenditure category, and by implementing entity (if applicable), physical indicators by activity as well as funding requirements by financier on a quarterly basis. Any expenditures incurred as part of the project will have to be part of the approved AWPB to be considered eligible for IFAD financing.

329. **Accounting.** The *Nema* PSU will maintain its accounting records in accordance with IPSAS cash basis for accounting. The project transactions will be recorded in the accounting software (FinEx). The accounting software includes a budget module, accounting module, financial reporting module, procurement module and fixed asset register. The accounting software will be further reconfigured to: i) accommodate the ASAP financing; ii) automatically generate all necessary financial and procurement reports; and iii) extended withdrawal application forms including extended statements of expenditure (SoEs) disclosing the complete audit trail for each expenditure item (budget line, payee, accounting/payments voucher ID, contract/invoice number, payment value date and so on).

330. **Internal Controls.** In order to ensure efficiency, reliability of financial reports, and compliance with applicable laws and regulations including the conditions set forth in the Financing Agreement, the PSU will ensure that adequate Internal Controls including:

- adequate policies and procedures;
- sufficient segregation of duties;
- fixed asset maintenance including tagging of all assets;
- periodic monitoring and review including comparison of physical and financial progress;
- proper authorization and access levels are maintained between the project parties;

- all project sites for works are clearly identified and mapped including GPS-coordinates (as appropriate) to facilitate supervision;
- all trainings will be duly documented including a list of participators; and
- all distributed goods, agricultural inputs (if any) reconciled against procured goods and supported by distribution lists of sufficient detail.

These will be outlined in details in the updated financial procedures manual to be approved by IFAD before the first disbursement.

331. Payment authorization. All payment are prepared by the Accountant, and cleared by the Financial Controller (FC) before being approved by the Project Director (PD).

332. Flow of funds. The flow of funds will follow the practice already in place for *Nema*. Accordingly the Government will open and maintain a separate Designated Accounts (DA) denominated in US Dollars at the Central Bank for the ASAP grant. The Withdrawal of Funds will follow IFAD disbursement procedures and the transfers will reflect the requirements of the project implementation.

333. As per the ongoing arrangements, the GoTG contribution will continue to be deposited in a separate bank account. It is foreseen that all bank accounts will be operated under the joint signature of the Project Director and the Financial Controller of the PSU as is currently the practice in *Nema*. As the IFAD original financing has already entered into force, no start-up funds from the ASAP grant are expected to be required.

334. Counterpart funds. The GoTG will approve the government allocations annually based on the approved AWPB. The funds will be transferred by the Ministry of Finance and Economic Affairs to a separate account managed by the PSU. The beneficiary contribution is expected to be in kind (land and labour) and will be estimated and recorded by the PSU.

335. Financial Reporting. The PSU will further customize its accounting software as necessary to produce automatically financial reports on a semi-annual basis in a format agreed with IFAD.¹⁵ The financial reports will link each transaction to a financing source (ASAP grant, GoTG contribution), expenditure category and activity as appropriate and compare incurred expenditures with the planned amounts (actual versus budget for a reporting period and cumulative versus appraisal). The PSU will provide IFAD with consolidated financial reports within agreed timeframes as follows:

- Quarterly/semi-annual consolidated interim financial reports (International Financial Reporting Standards – IFRS) as agreed with IFAD;
- annual consolidated Financial Statements within four months after the end of the fiscal year prepared in compliance with International Accounting Standards (IPSAS cash basis) and IFAD requirements; and
- annual consolidated audit report and a management letter within six months after the end of the borrower's fiscal year.

¹⁵ The financial reports will include at least the following reports: i) sources and uses of funds by financing source by category of expenditure; ii) incurred expenditures by component and financier including comparison of actual versus planned expenditures; iii) designated account reconciliations; iv) Statement of Expenditures - Withdrawal Application Statement; v) fixed asset register and vi) register of contracts and contract monitoring forms.

336. **Internal auditor.** The PSU does not have an internal audit function in place. However, the CPCU is in the process of creating this function to oversee all ongoing projects under MoA, which will include *Nema* and the ASAP financing.

337. **External audit.** The ASAP financing will be included in *Nema*'s annual audit exercise. Accordingly, the *Nema* PSU will contract independent auditors, selected by the National Audit Office (NAO) as per national practice in accordance with the procedures and criteria set forth in IFAD's Guidelines on Project Audits (for Borrower's Use) using QCBS as method of procurement (70% weight on quality and 30% weight on cost). The auditors will be required to audit the consolidated financial statements of the entire project for each fiscal year in accordance with International Standards on Auditing (ISA). The auditors will issue three separate opinions on i) the Financial statements, ii) use of the SoE and adequacy of supporting documentation, as well as iii) the operation of the Designated Accounts. The terms of reference for the audit will be agreed with IFAD on an annual basis. The audit report, including the management letter covering the audit observations on internal controls, will be submitted to IFAD within six months of the end of the fiscal year. The appointment of the auditor shall be for a maximum period of three years, subject to satisfactory performance.

338. **Records management.** The PSU under the CPCU and MoA will maintain adequate filing and ensure proper back up of all project records. In accordance with IFAD General Conditions, the borrower has to maintain the original records for a minimum of ten years after the project completion. The detailed procedures for records management and back up will need to be included in the updated Financial Procedures Manual.

C. IFAD disbursement procedures

339. **IFAD disbursement procedures.** In accordance with the IFAD disbursement procedures between the date of entry into force of the Financing Agreement and the Financing Closing Date, the borrower/recipient may request withdrawals from the Loan/Grant Accounts of amounts paid or to be paid for eligible expenditures. Accordingly four standard disbursement procedures may be used for withdrawal of financing:

- Advance withdrawal;
- Direct payment;
- Special commitment;
- Reimbursement.

340. **Authorized allocation of the Designated Account.** The Designated Accounts for the ASAP financing will be operated and replenished following the Imprest Account arrangements in accordance with IFAD disbursement procedures. After the respective financing agreements have entered into force and the respective conditions for first disbursement have been duly complied with, and upon request by the borrower, IFAD will make an initial deposits to the Designated Accounts equal to the requirements of six months implementation (Authorized Allocation).

341. **Conditions for first withdrawal.** As per IFAD's assessment, the following conditions related to financial management are to be met before the first withdrawal under the ASAP grant can be realized:

- IFAD has received from the Minister of Finance and Economic Affairs, a letter designating the name(s) of official(s) authorized to sign withdrawal applications, which includes their authenticated specimen signature(s);
- IFAD has received documentation evidencing the opening of the bank accounts designated to receive the financing with advice of the persons/titles authorized to operate these accounts;
- An updated Project Implementation Manual including the Financial Procedures Manual has been approved by IFAD;
- The key project staff including key financial staff has been duly appointed;
- The accounting software to have been reconfigured as agreed with IFAD; and
- The first Annual Work Plan and Budget (AWPB) has been approved by IFAD.

342. **Withdrawal applications.** The PSU will compile and consolidate, on a timely basis, eligible project expenditures for activities. From these expenditures, the PSU will prepare Withdrawal Applications (WAs) for eligible project expenditures under each financing source and submit these to IFAD. All WAs will be signed by the authorized signatories.

343. **Minimum withdrawal amounts.** In order to minimize transaction costs, the minimum withdrawal amounts are set as follows:

- Withdrawal Applications requesting replenishments of the Designated Account should at least cover a minimum amount of thirty percent (30%) of the initial advance.
- Direct Payment method should only be used for payments of USD 100,000 and above while expenditures below USD 100,000 should be financed from the Designated Account if possible and claimed through the replenishment of the Designated Account.

344. **Statement of Expenditure (SoE).** The SoE thresholds shall be determined in the light of the associated risk for each expenditure category and will be duly documented in the Letter to the Borrower. The initial estimate is that the SoE threshold will be unchanged as currently under *Nema*. The project will retain the relevant support documents and make them readily available for inspection and review by supervision missions and the auditors. It is foreseen that IFAD will introduce the use of extended SoE forms as part of the administration of the ASAP grant. The Extended SoE forms are designed to disclose the complete audit trail of each expenditure item, from budget line to bank actual payment. The SoE thresholds will be reviewed during project implementation.

D. Supervision, implementation support and implementation readiness

345. **Project supervision.** The project will be directly supervised by IFAD. Supervision will not be conducted as a general inspection or evaluation, but rather as an opportunity to assess achievements and lessons learnt jointly, and to reflect on ways to improve implementation and impact. From a financial management perspective, a financial management specialist will participate in missions annually to supervise and provide implementation support to the project and follow up the fiduciary risk at various levels including the use of the SoE.

346. Supervision and implementation support plan. In light of the risk assessment residual (medium FM risk), in the first two years of implementation the supervision plan of project will especially focus on the following actions:

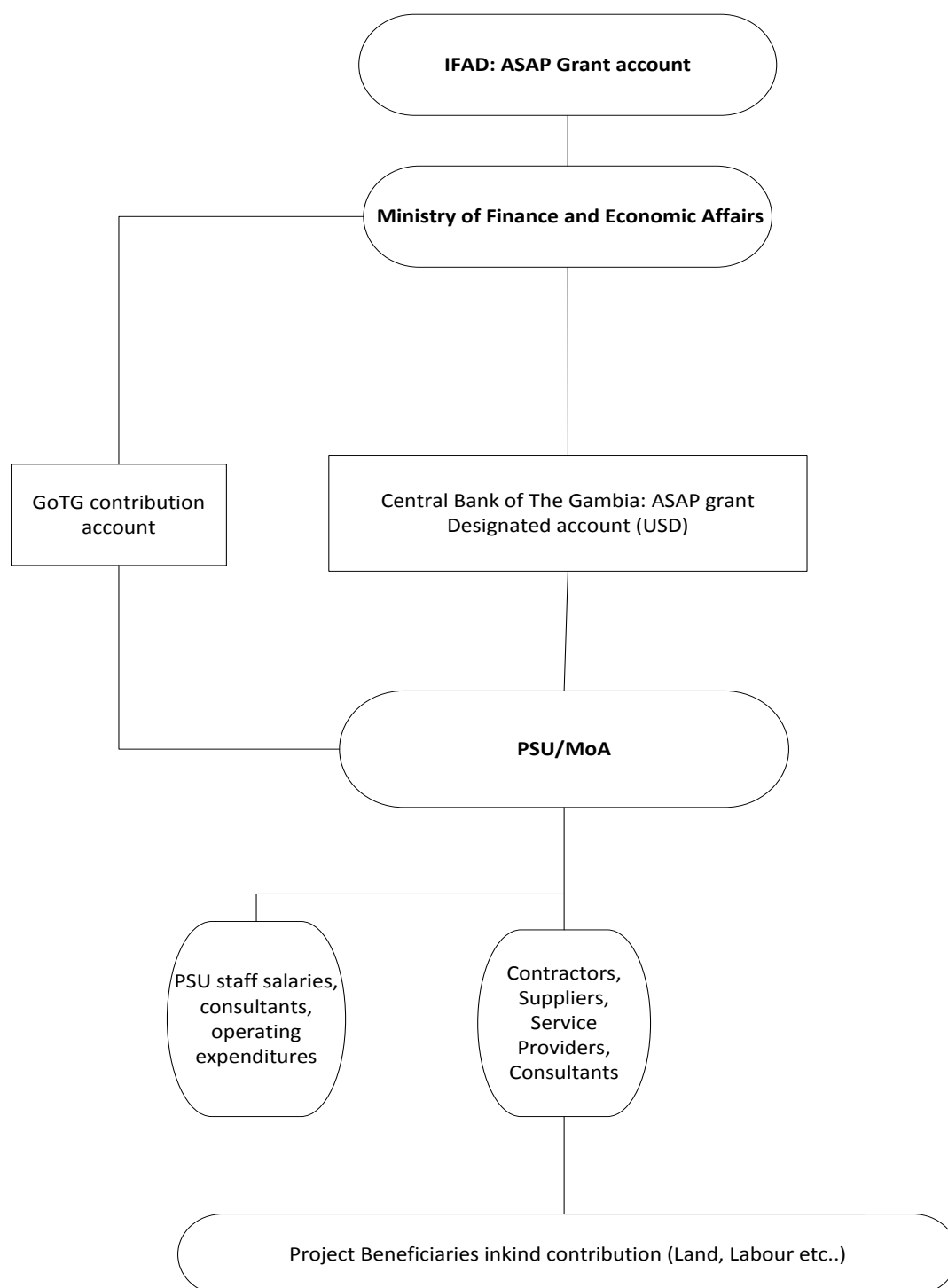
- detailed review of adequacy of the staffing arrangements at the FM unit of the PSU, including the ToR and performance of the financial staff and identification of training needs;
- detailed review of the project financial management and accounting procedures in use and the segregation of duties with respect to recording and approving of transactions;
- detailed review of the accounting software and financial reports and WAs including SoEs (if applicable) produced by the accounting software and the use of budget controls;
- review of overall flow of funds (and resolving any bottlenecks) and a detailed review of the operation of the designated and project accounts (including monthly reconciliations);
- detailed review of the fixed asset register and verification of a) inventory reports and b) assets through spot checks;
- detailed review of records management, back up and the use of the Statement of Expenditure (SoE) procedure and the applicable SoE-thresholds (adequacy of supporting documentation);
- follow-up on contracting the project (independent) external auditors; and
- follow-up on work performed by the internal audit function (as appropriate).

347. The supervision process will be complemented by desk review of progress and financial reports, the project's annual financial statements, internal audit reports, and annual audits.

Table A7.2: Implementation readiness – a list of key tasks

Action	By Whom	When	Conditionality
FC and accountant to be in place.	IFAD and the Borrower	Continuous.	Disbursement condition.
Financial procedures manual has been duly updated.	PSU	As soon as possible.	Disbursement condition.
Opening of Designated Account.	Borrower/PSU	Start up of additional funding.	Disbursement condition.
Format of the Quarterly Financial Reports and Annual Financial Statements to be agreed.	PSU	As part of the design.	N/A.
Update the project LTB to reflect the ASAP financing.	IFAD	Signing of the FA for ASAP financing.	Signing.
Prepare first AWPB & procurement plan for the ASAP financing.	PSU	Start up of ASAP financing.	Disbursement condition.
The ASAP grant to be audited annually as part of the <i>Nema</i> audit exercise (under ToR and conditions acceptable to IFAD).	PSU	Not later than 3 months after entry into force.	Financing Agreement Schedule 3.
New FM staff to be trained and to undertake the IFAD FM-learning course.	PSU	Upon Appointment.	N/A
The Accounting software to be reconfigured to automate all financial reports and extended SoEs.	PSU	By Signing of the FA for ASAP financing.	Disbursement condition

Project Flow of Funds Chart



Appendix 8: Procurement

A. Procurement assessment

348. Public procurement in The Gambia is currently governed by the Gambian Public Procurement Authority 2001 within a comprehensive legal framework. The Act seeks to provide a system for ensuring: a) transparent, efficient and economic public procurement; b) accountability in public procurement; c) a fair opportunity to all prospective suppliers of goods, works and consultancy services; d) the prevention of fraud, corruption and other malpractices in public procurement; and e) improvements in social and economic capacity in The Gambia, including the provision of opportunities for local small enterprises and individuals to participate in an economic manner as suppliers, contractors and subcontractors in public procurement.

349. Investment projects financed by an international agency are required to follow both the national procurement procedures and the donor procurement guidelines. However, where there is a conflict between the two procurement procedures, the donor guidelines will supersede. IFAD Procurement Guidelines would be followed for the procurement of labour, following IFAD's community-based procurement procedures, in order to ensure that people in participating villages have the opportunity (first refusal) for wage employment in carrying out the works in their own community. IFAD Guidelines would also be followed for the procurement of any technical assistance, as is the arrangement for the ongoing IFAD-financed projects.

B. Overall procurement arrangements

350. All procurement under the project would be managed by the Project Support Unit under the coordination of the CPCU and the Contracts Committee of MoA, with implementing agencies providing necessary technical specifications, bills of quantities and terms of reference. Bids would be evaluated by the MoA Contracts Committee comprising technical specialists of the relevant line agency and representatives of the PSU, and approved in line with the GPPA Act. Once the procurement process is completed and contracts signed, the overall management and coordination of the contracts and making of payments is the responsibility of the PSU. However, it is recommended that the MoA as the implementing agency should constitute a contract monitoring team to conduct physical verification on the status of implementation of activities of projects within the MoA and on the quality of works. IFAD will give "No Objection" clearance in the procurement process.

351. The contract committee under the MoA was set up in accordance with Section 49 of the GPPA, which requires all procuring organization in The Gambia to establish a Contracts Committee that will be supported by specialised procurement units within the organization. Among the functions of the committees as per the Act are the following:

- verification of proper procurement planning and availability of funds;
- approval of the invitation to bid and the bidding documents;
- approval of the use of single-source procurement in accordance with the Regulations;
- conducting the opening of bids;
- conducting technical and financial evaluation of bidding documents;

- submit the recommendations from the evaluation of bids to the Gambia Public Procurement Authority for approval (GPPA);
- Request for IFAD No Objection of GPPA approvals; and
- Signing of contracts with contractors.

352. The committee reviews all procurement activities under the MoA and also projects under the MoA. The committee is mandated to review all tenders but this regulation has recently changed where the MoA Contract Committee will review and evaluate tenders from the value of GMD 1.0 million to below GMD 10 million. All contracts above the value of GMD 10 million will be processed through the Major Tender Board under the Ministry of Finance and Economic Affairs.

353. All bidding documents for the procurement of goods, works and services shall be prepared by the PSU and forwarded for review by the Contracts Committee at MoA with the participation of PSU specialists as required. The procurement documents would be cleared by the implementing agency before any action is taken by the PSU.

354. Currently, MoA is not maintaining a database of contractors that have been awarded contracts under it. As a result, there is no list of barred or under-performing contractors.

355. There has been limited experience of direct Community Procurement of works, goods and services. However, for the implementation of *Chosso*, the project will build on and upscale any experience gained in this area.

C. Procurement Arrangements in the PSU

356. **Staffing.** The PSU does not have a Procurement Specialist in place yet although IsDB has made provision to recruit a Procurement Officer under its financing. At the moment, GPPA has attached a Procurement Officer to the *Nema* PSU to provide relevant support, whilst the Supervising Engineers are supporting the PSU in bid preparations and technical specifications. As a result, there is a need to strengthen PSU procurement capacity in the form of a designated Procurement Officer, as well as training in procurement processes.

357. **Bidding documents.** All bidding documents for the procurement of goods, works and services will be prepared by the PSU and the Supervising Engineers. The technical specification will be prepared in consultation with the beneficiaries and the supervising engineers. The bidding documents shall be based on the national procurement sample documentation appropriated for IFAD's purposes.

358. **Performance-based contracts.** The project envisages performance-based contracts for service providers as being practiced under *Nema*. During the procurement of these providers and the renewal of contracts, the performance criteria will be specified clearly as the basis upon which disbursements will be made.

359. **Procurement plan:** The PSU will prepare an AWPB and a Procurement Plan in a format acceptable to IFAD for the first 18 months of project implementation. The Procurement Plan will provide the basis for the procurement methods and prior/post review threshold, and be would be updated at least annually or as required to reflect the actual project implementation needs.

360. **Procurement progress report.** Procurement information would be recorded by the PSU in the procurement module of the accounting software FinEx and submitted to IFAD, as part of the semi-annually and annual progress reports. The procurement progress reports

should list all signed contracts for the reporting period and cumulatively from the beginning of the project implementation and should disclose the following information for each contract: Expenditure Category, Financing Source, Procurement Method, contract start and end, Supplier/contractor name and address, Total Contract Value, Total Contract Amount Invoiced, Date of IFAD No Objection, and so forth.

361. Register of contracts. In addition, all contracts will be listed in the Register of Contracts in a format agreed with IFAD and maintained by the PSU in the procurement module of the accounting software FinEx. The register of contracts will include information on contractor/supplier/service provider, contract amount, procurement method, contract signing, contract duration, date of IFAD No Objection and prior/post review. The PSU will also prepare up to date contract monitoring forms to keep track of commitments.

362. Record keeping. The PSU/MoA under the respective ministries will maintain complete procurement files that will be reviewed by IFAD supervision missions and backed up electronically, if applicable. In accordance with IFAD General Conditions, the Recipient has to maintain the original records for a minimum of ten years after the project completion.

363. Procurement methods would include the following.

Procurement of Goods: The goods to be financed under the project include, but are not limited to, the following: productive tools and machinery and office equipment. Contracts for locally available goods would be procured in accordance with The Gambia's Public Procurement Act.

Procurement of Works and Technical Services: The works to be financed under the project would be procured in accordance with procedures acceptable to IFAD.

Procurement of Labour: IFAD's procedures on community-participation in procurement would apply for the procurement of labour under civil works contracts. This would ensure that people in participating villages are given opportunities for wage employment.

Procurement for Consulting Services: The consulting services to be financed under the project include, but are not limited to, the following: specialists in knowledge management, value chain development, agricultural water control, experts to undertake studies as required. IFAD Procurement Guidelines would apply for the procurement of consultants. Depending on the nature and cost of the service to be provided, one of the following methods would be employed.

- **Quality and Cost Based Selection (QCBS):** The consulting services to be contracted would be procured based on QCBS procedure in accordance with IFAD Guidelines.
- **Selection based on Consultants' Qualifications:** This procurement procedure will be in accordance with IFAD Guidelines.
- **Individual Consultants:** The consulting services for strengthening project management and implementation to be contracted to individual consultants would be procured based on Individual Consultants in accordance with IFAD Guidelines. For individual consultants to be hired for more than six months duration, the positions would be advertised for expressions of interest in international and/or national media depending on the expertise required, and selection would be based on comparison of qualifications of those expressing interest.

Direct Contracting. Direct contracting would be used for some expenses related to training, (the venue, for example), and the payment of recurrent costs, including staff salaries, contracted staff salaries, allowances, travel and office operating costs.

364. The thresholds determining the above procurement methods will be specified in the PIM and the Letter to the Beneficiary.

365. **Prior review of procurement by IFAD** The thresholds that will determine the requirement of IFAD's prior review of procurements are proposed as follow:

- for civil works equivalent to or above USD 40,000;
- for goods equivalent to or above USD 30,000; and
- for services (implementing partners, trainings, TA, private entities) equivalent to or above USD 25,000.

366. For any procurement exceeding the above thresholds, the project is required to obtain IFAD's No Objection. The No Objection procedure is specified in IFAD's Procurement Guidelines. The above thresholds will be formalized in the Letter to the Beneficiary and IFAD has the right to revise the thresholds upward or downward subject to the project's fiduciary performance during implementation.

Procurement issues

367. As the project focuses on community participation and investments, procurement of most works and small quantities of locally available goods would need to be carried out by the implementing agencies. These offices have limited experience with IFAD procurement procedures and thus would need to be supervised closely by the PSU's designated procurement specialist.

Appendix 9: Project cost and financing

368. The indicative *Chosso* project cost is USD 5.70 million over the four-year period (2016 to 2019 inclusive), synchronised with the remaining implementation stages of *Nema*. Costs have been derived from the data obtained during the detailed and final design missions, each featuring a national multi-stakeholder validation workshop, technical discussions with GoTG and key partners as well as numerous consultations with target beneficiaries and other development partners and a review of unit costs of similar projects.

Main assumptions

369. This section describes the assumptions underlying the derivation of project costs that are based on April 2015 prices. The proposed project would be financed over a four-year period and expected to start no later than January 2016. Expenditure and disbursement accounts used for this analysis conform to the new standard categories established by IFAD in August 2013.

370. **Price and physical contingencies.** The Economist Intelligence Unit forecasts that domestic consumer price inflation will average 4% a year 2016-19, and that domestic inflationary pressures will be contained by lower international food and oil prices in the coming years. Foreign inflation rate has been set at 2.0% a year 2016-19.¹⁶ These rates were applied to all expenditure categories subject to price increases during project implementation. In addition to price contingencies, physical contingencies ranging between zero and 10% have been applied to base costs as appropriate, averaging 8% in all.

Table A9.1: Inflation rates

	2016	2017	2018	2019
Local	4.0	5.0	5.0	4.0
Foreign	2.0	2.0	2.0	2.0

371. **Exchange rates.** The Gambia Dalasi has depreciated against the US dollar over the past years, with the rate of depreciation accelerating since the start of 2015. Further depreciations are expected during the project implementation period. The base exchange rate used for this analysis was set at GMD 50.00 = USD 1 and will be updated as longer term projections become available. The average commercial foreign exchange rate at the time of the detailed design mission was GMD 52 = USD 1.

372. **Taxes and duties.** All domestic service and supply contracts, including those for civil works, are subject to a turnover tax of 2.5% (or 33% of profits if greater). These taxes are shown in the cost tables to indicate the revenues foregone by GoTG, as project expenditures are exempted. Similarly, imports are subjected to excise duties, sales taxes, fees and an environment levy that total 37% for most relevant categories, but the applicable duties are waived for goods and services imported for direct use by the project. Income and social security taxes for contracted staff would be paid by the concerned individuals. Any future possible amendments to tax treatment at IFAD level would be applied to the grant.

373. **Expenditure accounts,** with the breakdown of taxes, physical contingencies and the average rates for foreign exchange used in the analysis, are shown in Table A9.2 below. Physical contingencies have been applied to items for which the required amounts could not

¹⁶ World Economic Outlook, January 2015.

be estimated precisely: Civil Works, Consumables and Salaries & Allowances (10%); and equipment & goods and other operating costs (5.0%). The physical contingencies on the predominant civil works activity provide sufficient flexibility to allow for more or less of certain types of works, depending on the requirements in specific watersheds, or redeployment to other budget lines in the latter stages of implementation if required.

Table A9.2: Expenditure accounts (percent of costs)

Description	Taxes	Physical	Foreign
		contingency	exchange
Investment costs			
A. Studies and training	2.5	0.0	65.0
B. Civil Works	2.5	10.0	30.0
C. Vehicles, equipment and goods	2.5	5.0	65.0
D. Technical assistance	2.5	10.0	90.0
E. Monitoring and evaluation	2.5	0.0	20.0
Recurrent costs			
A. Operating costs	2.5	5.0	0.0
B. Salaries and allowances	2.5	10.0	0.0

Project costs

374. Total project costs are estimated at USD 5.70 million over a four-year implementation period and include USD 744,178 on physical and price contingencies, accounting for 8% and 7% of the total base costs, respectively. Foreign exchange accounts for about 27% of total project costs, mainly from civil works. Duties and taxes make up USD 202,925 (3.6%). Table A9.3 below summarises the project costs by component.

Table A9.3: Project costs by component

	(GMD '000)			(USD '000)			% Forex	% total base costs
	Local	Foreign	Total	Local	Foreign	Total		
1 Watershed development	140,165.1	45,786.6	185,951.7	2,803.3	915.7	3,719.0	25	75
2 Agricultural commercialization	14,000.0	6,950.0	20,950.0	280.0	139.0	419.0	33	8
Project facilitation	25,076.5	15,633.5	40,710.0	501.5	312.7	814.2	38	16
Total baseline costs	179,241.6	68,370.1	247,611.7	3,584.8	1,367.4	4,952.2	28	100
Physical contingencies	14,605.0	5,004.4	19,609.4	292.1	100.1	392.2	26	8
Price contingencies	15,067.4	2,532.2	17,599.5	301.3	50.6	352.0	14	7
Total project costs	208,913.9	75,906.6	284,820.6	4,178.3	1,518.1	5,696.4	27	115

375. **Project Structure.** Chosso will be implemented by GoTG structures complemented by external contractors for specific specialist services, based on the experience of recent IFAD-supported interventions.

376. For the implementation of supplementary activities under *Component 1: Watershed development* (75% of base costs or USD 4,361,491 with contingencies), Chosso would operate through established *Nema* delivery modalities with the expanded scope of the two new subcomponents *1.2.5 Community water harvesting* and *1.5 Community forest restitution*. The substantial expenditure on infrastructure upgrading (19.5% of base costs) would be applied to the 46.45% of the corresponding three *Nema* subcomponents funded by IFAD. Similarly, the relatively modest village vegetable scheme upgrading activity (2.2% of base costs) would be applied to the 22 schemes funded by IFAD.

377. Under *Component 2: Agricultural commercialization* (8.5% of base costs or USD 451,874 with contingencies) *Chosso* would promote the capacity building of private and public sector institutions related to climate change adaptation.

378. Resources allocated for supplementary overall *Chosso project facilitation* make up 16.4% of total base costs, or USD 814,200 with contingencies, with sufficient resources to mainstream climate change adaptation into both the *Nema* project and wider GoTG services.

Table A9.4: Project components by year - totals including contingencies (USD)

	2016	2017	2018	2019	Total
1 Watershed development	1,025.6	1,284.5	1,156.5	895.0	4,361.5
2 Agricultural commercialization	219.3	85.1	88.2	59.3	451.9
Project facilitation	270.1	243.3	205.5	164.2	883.0
Total project costs	1,515.0	1,612.9	1,450.1	1,118.5	5,696.4

379. **Disbursement accounts and rules.** The financing rules (total allocation net of taxes) adopted for each disbursement account are summarised in Table A9.5 below.

Table A9.5: Disbursement accounts and financing rules

Disbursement categories	Financing rules (net of taxes)
All <u>except</u> those below	IFAD-ASAP (100%)
Drainage networks for new TI schemes, Trench and Earth dam storage structures	IFAD-ASAP (90%), Beneficiaries (10%)
Run-off structure catchment	IFAD-ASAP (95%), Beneficiaries (5%)
Community agroforestry and Mangrove restoration – labour	Beneficiaries (100%)
Community woodlots – materials and labour	IFAD-ASAP (85%), Beneficiaries (15%)
Salaries- Driver	IFAD (70%), GoTG (30%)
Office operating costs	GoTG (100%)

Financing

380. **Adaptation for Smallholder Agriculture Programme (ASAP) grant.** IFAD-ASAP resources available for financing the costs of the supplementary project amount to USD 5.0 million over four years from January 2016 to December 2019. The grant makes up 87.8% of total estimated project costs. The proportion of recurrent costs funded by IFAD-ASAP averages 1.1% of the total contribution.

381. **Government of The Gambia.** Grant funds would be complemented by the GoTG with about USD 224,453 in the form of waived taxes, staff salaries and operating expenses associated with the Project Support Unit. In the spirit of mainstreaming *Chosso* activities within the work plan of the MoA, the incremental office operating costs and a proportion of the costs of an extra driver associated with *Chosso* implementation support (estimated at USD 21,528) are assigned to GoTG funding rather than the ASAP financing.

382. The estimate of taxes and duties is based on the rates in effect prevailing at the time of the final design mission. In conformity with the principle that no taxes or duties would be financed out of the proceeds of IFAD financing, any future changes in the rates and/or structures of taxes and duties would have to apply to the project.

383. **Beneficiaries.** Communities are expected to contribute a proportion of the costs of the restitution and development of productive land and water resources, including river margins,

in their watershed with contributions in kind (mainly land, labour and construction materials) and/or cash. Specifically, farmers, producer organisations and water user groups would mobilise resources for: Drainage networks for new TI schemes, Construction of pilot Trench and Earth dam water harvesting structures (10% of total cost of the activity) and Run-off catchment structures (5%); Community agroforestry and Mangrove restoration - labour (100%); and Community woodlots (15%). Overall contributions from beneficiaries are estimated at USD 471,959 or 8.3% of the total project costs.

384. **Other development partners.** IFAD will actively seek partnerships with other development partners, particularly the *Nema* cofinanciers, to ensure coherence in the climate change mainstreaming campaign in the country.

385. Tables 9.5 provide a summary of the proposed financing by project components. A complete set of tables regarding project financing can be found on file.

Table A9.6: Project components by financiers (USD)

	Government		IFAD (ASAP)		Beneficiaries		Total		Forex	Local (Excl. Taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%	Amount	%			
1 Watershed development	109.0	2.5	3,780.5	86.7	472.0	10.8	4,361.5	76.6	1,041.9	3,210.6	109.0
2 Agricultural commercialization	47.1	10.4	404.8	89.6	-	-	451.9	7.9	149.4	255.4	47.1
Project facilitation	68.3	7.7	814.7	92.3	-	-	883.0	15.5	326.9	509.3	46.8
Total PROJECT COSTS	224.5	3.9	5,000.0	87.8	472.0	8.3	5,696.4	100.0	1,518.1	3,975.4	202.9

Table A9.7: Expenditure accounts by financiers (USD)

	Government		IFAD (ASAP)		Beneficiaries		Total		Forex	Local (Excl. Duties & Taxes)	
	Amount	%	Amount	%	Amount	%	Amount	%		Taxes	Taxes
I. Investment Costs											
A. Studies and training	7.8	2.5	304.0	97.5	-	-	311.8	5.5	65.0	239.1	7.8
B. Civil works	102.2	2.5	3,512.8	86.0	472.0	11.5	4,086.9	71.7	987.9	2,996.8	102.2
C. Vehicles/Equipment and goods	55.1	35.4	100.6	64.6	-	-	155.7	2.7	98.3	2.3	55.1
D. Technical assistance	11.9	3.4	333.7	96.6	-	-	345.6	6.1	151.3	182.4	11.9
E. Monitoring and Evaluation	17.8	2.5	695.6	97.5	-	-	713.4	12.5	209.1	486.4	17.8
Total Investment Costs	146.4	3.5	4,946.6	88.1	472.0	8.4	5,613.4	98.5	1,511.6	3,906.9	194.8
II. Recurrent Costs											
A. Operating costs	18.8	68.9	8.5	51.5	-	-	27.2	0.5	6.5	14.1	6.7
B. Salaries and allowances	10.8	19.4	44.9	70.0	-	-	55.7	1.0	-	54.4	1.4
Total Recurrent Costs	29.6	35.7	53.4	62.4	-	-	83.0	1.5	6.5	68.4	8.1
Total PROJECT COSTS	224.5	3.9	5,000.0	84.6	472.0	8.3	5,696.4	100.0	1,518.1	3,975.4	202.9

Table A9.8: Expenditure accounts by years - totals including contingencies (USD)

	2016	2017	2018	2019	Total
I. Investment Costs					
A. Studies and training	170.5	86.3	55.1	-	311.8
B. Civil works	873.4	1,217.2	1,101.4	895.0	4,086.9
C. Vehicles/Equipment and goods	155.7	-	-	-	155.7
D. Technical assistance	98.2	101.1	91.2	55.1	345.6
E. Monitoring and Evaluation	197.6	188.0	181.4	146.4	713.4
Total Investment Costs	1,495.3	1,592.5	1,429.0	1,096.5	5,613.4
II. Recurrent Costs					
A. Operating costs	6.5	6.7	6.9	7.1	27.2
B. Salaries and allowances	13.1	13.7	14.2	14.8	55.7
Total Recurrent Costs	19.6	20.4	21.1	21.9	53.0
Total PROJECT COSTS	1,515.0	1,612.9	1,450.1	1,118.5	5,696.4

Table A9.9: Expenditure accounts by components - totals including contingencies (USD)

	Watershed development	Agricultural commercialization	Project facilitation	Total
I. Investment Costs				
A. Studies and training	274.6	37.2	-	311.8
B. Civil works	4,086.9	-	-	4,086.9
C. Vehicles/Equipment and goods	-	110.1	45.6	155.7
D. Technical assistance	-	85.9	259.7	345.6
E. Monitoring and Evaluation	-	218.6	494.8	713.4
Total Investment Costs	4,361.5	451.9	800.1	5,613.4
II. Recurrent Costs				
A. Operating costs	-	-	27.2	27.2
B. Salaries and allowances	-	-	55.7	55.7
Total Recurrent Costs	-	-	83.0	83.0
Total PROJECT COSTS	4,361.5	451.9	883.0	5,696.4
Taxes	109.0	47.1	46.8	202.9
Foreign Exchange	1,041.9	149.4	326.9	1,518.1

Appendix 10: Economic and financial analysis

Introduction

386. The *Chosso* is an additional investment in the last four of the seven-year National Agricultural Land and Water Management Development Project (*Nema*). The estimated additional resources represent an uplift of about 8.6% of the original total project cost or 14.0% of the projected budget of *Nema* PY 4-7. The main purpose of the additional injection of resources is to consolidate and extend the positive outcomes of *Nema*, both private and (mainly) public goods, in response to a recent and ongoing acceleration of climate change and associated negative effects on the mass of smallholder farmers in The Gambia.

387. In this context, *Chosso* comprises:

- climate-proofing modifications (structural design, capacity building and pilot innovation) to *Nema* water control infrastructure and vegetable production schemes, (23.4% of total costs), most of which changes are already being made to the *Nema* design under implementation; and
- enhancements to the *Nema* operating domain (*Community water harvesting* and *Community forest restitution*) and to the management capacity of both target communities and *Nema* itself to promote the resilience and sustainability of smallholder agriculture and fisheries in a depleted and deteriorating natural resource base, (76.6%).

388. As the full title of *Nema* indicates, the 2012 design concentrated investments on the physical repair and proper management of the natural resource base available for agricultural production, particularly soil quality, the supply of agricultural water (mainly for irrigated and rainfed crops, with some livestock) and the disposal of excess surface water.

389. However, whilst the financial and economic analysis of *Nema* was founded on the sustainable incremental production of rice and vegetables (private goods of direct benefit to the target group), *Chosso* is concentrated on the supporting public goods (soil quality, tree cover, management capacity and technical services) which are of indirect benefit to farmers within the parent project. The two analytical challenges are the difficulty in quantifying the most important NR outcomes in whole watersheds and the fact that only a part of the protracted decline in the economic carrying capacity of the natural resource base can be attributed to climate change. In this context, the imperative is to arrest and reverse the downward trend.

390. It is noted that *Chosso* as designed is an adjunct to the *Nema* structure and could not exist as a stand-alone project.

Project benefits

391. *Chosso* is expected to generate benefits for present and future smallholders engaged in agricultural production (particularly rice and vegetables), as well as for domestic consumers and the country as a whole in the face of adverse climate change. The main benefits generated by the project would be in terms of the **economic carrying capacity** of the natural resource base upon which the rural economy depends and the **adaptive capacity** of farming communities and individual households within watersheds, including the following quantitative and predominantly qualitative aspects. To these end, the three

complementary *Chosso* intervention domains comprise **Capacity building, Asset creation and Adaptation knowledge creation and exchange**, as follows:

392. **Capacity building: institutions and entitlements.** *Chosso* would capacitate smallholders to anticipate, incorporate and respond to changes in climate and to participate in adaptation planning by strengthening the representation of community groups in public and private investment planning processes. As is the practice in the parent *Nema*, the capacity development of women and youth groups to participate actively in village and watershed planning processes would form an important part of the project. These processes are the precursors to the effective collective management of common resources and the determination of how community human and physical assets, including households' time, energy and resources, are used to build resilience.

393. *Chosso* would develop and strengthen an appropriate and evolving institutional environment that allows fair access and entitlement to key assets and capital, such as support for and follow-up on community-based adaptation planning. Gender and youth structures would lead the climate change sensitisations given their established relationships and ways of working with their constituencies.

394. Empowerment through capacity development would also be promoted through the application of climate information services in farmers' field schools and functional literacy classes. *Nema* operates a targeting policy with minimum quotas in enterprise development and capacity development for women and youth. This would continue with *Chosso* in order to promote adaptive capacity among women and youth, who are among the most vulnerable to climate change.

395. **Asset creation: stabilised productive asset base.** The increased availability of key assets, such as technologies that help to reduce or diversify risk, would allow farming systems and the natural resource base to respond to evolving circumstances. Protection of the substantially increased agricultural production under *Nema* is expected to defend progress to food security, income growth and ultimately asset creation.

396. Investments in *Community water harvesting* would build physical communal assets. Climate change sensitisations, together with the participatory development and application of weather and seasonal decision-support tools and sustainability/climate change training, are expected to build human capital. *Community forest restitution* would constitute direct reinvestment in the depleted natural resource asset base to buffer climate change effects. In combination, these investments would build adaptive capacity to cope with future climate shocks and help to reduce risk, for example through anticipatory agricultural planning.

397. **Adaptation knowledge creation and exchange.** Creation of an enabling environment would foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities, such as climate-resistant types of seeds. The project would increase the ability of smallholders and GoTG to collect, analyse and disseminate knowledge and information in support of adaption activities, such as access to seasonal climate forecasts or early warning information for climate hazards. Short-range and seasonal forecasting and decision-support tools would be developed through a participatory process between extension workers and farmers. The project would convene practitioners in this field of work as communities of best practice in order to share ideas, experiences and ultimately develop agricultural messaging that is useful to farmers. This process would develop institutional capacities that would be able to replicate the approach to other communities.

398. The following table summarizes the quantifiable and non-quantifiable benefits expected from the *Chosso* subcomponents in adding value to the effectiveness and sustainability of the *Nema* project as a whole and of those interventions financed by IFAD in particular. The *Chosso* subcomponents are rearranged as primarily *modifications* of or *enhancements* to the ongoing *Nema*.

399. All proposed activities converge on the drive for increase resilience to climate change, each contributing through one or more of three channels:

- capacity building (focused on planning and management skills) for smallholders and rural communities, service providers and GoTG units, including *Nema* itself as an agent of change, (18.7% of the *Chosso* budget);
- asset creation with investments in economic and social capital, primarily to protect and reconstitute the physical natural resource base, which is the remit of *Nema*, (67.6%); and
- adaptation knowledge creation and exchange, including the learning from the full-scale piloting of technologies (Tidal irrigation structures and Community water harvesting structures), (13.7%).

400. It is noted that the preponderance of anticipated *Chosso* benefits are classified as **public goods** of material assistance to the mass of smallholders indirectly rather than directly.

Table A10.1: Chosso benefits by subcomponent

Chosso activities (% cost)	Direct benefits (private goods)	Indirect benefits (public goods)
Climate-proofing modifications to <i>Nema</i> design (23.4%)		
1.2.1 Tidal irrigation scheme design adaptation. (7.1%)	<ul style="list-style-type: none"> Assets: more efficient production system with secured and stabilized yields. Assets: O&M time saved and costs reduced. Assets: reduced losses to flooding. 	<ul style="list-style-type: none"> Capacity: social capital built up through collective action of WUGs. Capacity: WUG empowered to manage and operate scheme more efficiently. Capacity: reduction in conflicts over water. Assets: sustainability of <i>Nema</i> investments protected against negative effects of climate change, including tidal variations and flooding. Assets: increased water distribution efficiency (control of irrigation water and drainage) on 160 ha of tidal irrigation rice fields. Knowledge: learning from piloting of design modifications.
1.2.2 Lowland water control infrastructure adaptation. (6.9%)	<ul style="list-style-type: none"> Assets: decline in soil fertility arrested. Assets: gradual increase in the cropping area with desalinisation of abandoned cropland. Assets: enhanced in-field accessibility for farmers. 	<ul style="list-style-type: none"> Assets: sustainability of <i>Nema</i> investments protected against negative effects of climate change, including damage to dikes caused by heavy rainfall events. Assets: improved control of surface water over 4,320 ha of productive land. Assets: reduced saline water incursion and salinization of soils. Assets: increased retention of usable agricultural water. Assets: reduced loss of topsoil.
1.2.3 Upland water control infrastructure adaptation. (5.5%)	<ul style="list-style-type: none"> Assets: decline in soil fertility arrested. Assets: reduced flooding of farmlands and settlements. 	<ul style="list-style-type: none"> Capacity: more harmonious relationships between men and women with improved food security and income. Assets: improved control of surface water over 4,500 ha of uplands vulnerable to extreme climate events. Assets: increased retention of rainfall and recharge of ground water aquifers. Assets: reduced flooding from heavy rainfall events. Assets: increased soil fertility (improve soil moisture and reduced loss of topsoil/sediments).

Chosso activities (% cost)	Direct benefits (private goods)	Indirect benefits (public goods)
1.3.1 Climate-proofing <i>kafo</i> women vegetable schemes. (1.4%)	<ul style="list-style-type: none"> Assets: more reliable and efficient water supply to meet in-field crop-soil water demand. Assets: increased economy in application of water. Assets: reduced evaporation losses (night watering, windbreaks). Assets: saving of time spent on watering. 	<ul style="list-style-type: none"> Capacity: <i>kafos</i> with tools, skills and knowledge for effective management of each scheme. Capacity: social capital built up through collective action of WUGs (women). Assets: sustainability of <i>Nema</i> investments protected against negative effects of climate change.
1.3.2 Climate-proofing youth vegetable schemes. (0.8%)	<ul style="list-style-type: none"> Assets: more reliable and efficient water supply to meet in-field crop-soil water demand. Assets: optimum economy in application of water. Assets: minimal evaporation losses (night watering, windbreaks). Assets: saving of time spent on watering. 	<ul style="list-style-type: none"> Capacity: youth groups with tools, skills and knowledge for effective management of each scheme as an enterprise. Capacity: social capital built up through collective action of WUGs (youth). Assets: sustainability of <i>Nema</i> investments protected against negative effects of climate change.
2.3.1 Capacity building of technical service providers. (1.6%)	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Capacity: improved knowledge and awareness of domestic contractors to undertake climate-sensitive infrastructure projects. Capacity: increased pool of service providers. Capacity: timely start of contract execution (reduced risks of implementation delays, time saving for communities and PSU). Assets: more competitive prices on contracts.

Chosso activities (% cost)	Direct benefits (private goods)	Indirect benefits (public goods)
Climate-proofing enhancements to Nema design (76.6%)		
1.1.1 Community adaptation management capacity. (4.5%)	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> • Capacity: rural population behaves positively to CC issues being promoted by the project. • Capacity: communities empowered with knowledge and skills to assess CC-associated risks, to inform better NRM planning and to adopt sustainable and recommended CC practices to safeguard their livelihoods. • Capacity: women and youth play an active role in watershed and community planning activities. • Capacity: adaptation mainstreamed into 120 watershed management plans. • Capacity: MDFTs capacitated with CC adaptation knowledge and skills. • Knowledge: adaptation curriculum/tools available. • Knowledge: communities fully aware of relationships between farming behaviour, natural resource use and climate change. • Knowledge: wide adoption of resilience practice through local and traditional networks of farmers to other communities.
1.2.5 Community water harvesting. (13.8%)	<ul style="list-style-type: none"> • Assets: supplementary supply of multi-purpose water through long dry season for 24 communities. • Assets: supplementary income from vegetables, livestock, pisciculture or non-agricultural productive activities. • Assets: income from temporary employment. 	<ul style="list-style-type: none"> • Capacity: social capital built up through collective action of WUGs. • Capacity: skill development of DWR staff and communities. • Assets: physical community assets created. • Assets: reduced wastage of fresh water. • Knowledge: learning from piloting of alternative community water harvesting schemes.

Chosso activities (% cost)	Direct benefits (private goods)	Indirect benefits (public goods)
1.5.1 Community agroforestry. (5.9%)	<ul style="list-style-type: none"> Assets: greater energy security (fuelwood) and time saving. Assets: provisioning benefits (honey, fruits, medicinal). Assets: fodder. 	<ul style="list-style-type: none"> Capacity: community members and management group capacitated with tools and knowledge on better agroforestry practices. Assets: physical community productive NRs restored. Assets: recovery of degraded land. Assets: reduced pressure on NRs. Assets: agro-biodiversity restored. Assets: increased rainwater infiltration with associated effects on groundwater levels. Assets: reduced soil erosion (affecting soil quality) and river sedimentation. Assets: shade and windbreaks. Assets: carbon sequestration.
1.5.2 Community woodlots. (5.0%)	<ul style="list-style-type: none"> Assets: income from timber crop and wood products. Assets: greater energy security (fuelwood) and time saving. Assets: provisioning benefits (honey, fruits). 	<ul style="list-style-type: none"> Assets: physical community assets created (75 woodlots). Assets: reduced tree cutting. Assets: agro-biodiversity restored. Assets: increased rainwater infiltration with associated effects on groundwater levels. Assets: reduced soil erosion (affecting soil quality) and river sedimentation. Assets: carbon sequestration.
1.5.3 Mangrove restoration. (24.2%)	<ul style="list-style-type: none"> Assets: greater energy security. (fuelwood). Assets: building materials. Assets: provisioning benefits (fish, oysters). 	<ul style="list-style-type: none"> Assets: physical community assets restored; 600 ha mangrove. Assets: restoration of fish and oyster stocks. Assets: protected river margins in perennially and seasonally saline areas. Assets: river biodiversity restored. Assets: carbon sequestration.
2.1.1 Climate resilience for producers. (1.4%)	<ul style="list-style-type: none"> Capacity: at least 1,200 producers acquire know-how and technologies to manage climate-related risks in farming systems. 	<ul style="list-style-type: none"> Knowledge: validated tools accessible to public and private institutions, groups and other stakeholders.

Chosso activities (% cost)	Direct benefits (private goods)	Indirect benefits (public goods)
2.3.2 Climate risk information services. (1.5%)	<ul style="list-style-type: none"> Knowledge: better planning of the cropping calendar, increased efficiency. 	<ul style="list-style-type: none"> Capacity: enhanced technical capacity of public agency. Knowledge: timely and useful information to inform communities' livelihood activities.
2.3.3 Hydrological information services. (4.0%)	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Capacity: enhanced technical capacity of public agency. Knowledge: public information that can be used by government planners and other investors.
3.1.1 Climate change management capacity. (7.1%)	<ul style="list-style-type: none"> Capacity: managers trained in adaptation issues. 	<ul style="list-style-type: none"> Capacity: augmented pool of public sector technical staff to support national CC advocacy, prioritisation and promotion of smallholder resilient approaches and c to inform sectoral and inter-sectoral dialogues. Capacity: improved monitoring and better preparedness in mitigating CC risks. Capacity: proficient delivery of <i>Chosso</i> outcomes and embedding of climate change adaptation in full range of <i>Nema</i> investments.
3.2.1 Resilience research and climate policy dialogue. (9.4%)	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Capacity: staff with tools, knowledge and skills for effective and efficient CC forecasting and budgeting. Capacity: staff capacitated proactively to provide strategic advisory and decision support. Knowledge improved understanding CC risks. Knowledge: in-depth technical knowledge to support and promote community-based climate-proofed practices and economic adaptation measures appropriate to The Gambia. Knowledge: adaptation innovation and best practice identified and incorporated in rural economic development. Knowledge: incremental climate-proofed "know-how" widely accessible for up-scaling. Knowledge: international sharing of experience on CC adaptation in support of smallholder uptake of resilience practices

Project beneficiaries

401. The project combines location-specific activities and whole watershed interventions targeted at different groups of beneficiaries.

402. *Chosso* adaptation activities would benefit directly the rice farmers targeted by *Nema*'s tidal irrigation and lowland/upland rainfed investments in productive lands, and women and youth operators of village vegetable schemes. Whole communities would benefit from an intensification of watershed restitution and reforestation activities.

Table A10.2: Chosso beneficiaries by subcomponent

Beneficiaries	M/E	Unit	Number
Component 1: Watershed development			
1.1.1 Community adaptation management capacity.	E	community	120
1.2.1 Tidal irrigation scheme design adaptation.	M	smallholder	160
1.2.2 Lowland water control infrastructure adaptation.	M	smallholder	1,440
1.2.3 Upland water control infrastructure adaptation.	M	NR user	1,500
1.2.5.1 Community water harvesting – trench storage.	E	community	10
1.2.5.2 Community water harvesting – Earth dam storage	E	community	4
1.2.5.3 Community water harvesting – Run-off structure catchment	E	community	4
1.2.5.4 Community water harvesting – Barrage saline water barrier	E	community	6
1.3.1 Climate-proofing <i>kafo</i> women vegetable schemes.	M	women <i>kafo</i>	14
1.3.2 Climate-proofing youth vegetable schemes.	M	youth group	8
1.5.1 Community agroforestry.	E	smallholder	2,000
1.5.2 Community woodlots.	E	community	75
1.5.3 Mangrove restoration.	E	community	60
Component 2: Agricultural commercialization			
2.1.1 Climate resilience for producers.	E	smallholder	1,200
2.3.1 Capacity building of technical service providers.	M	contractor	60
2.3.2 Climate risk information services.	E	smallholder	10,000
2.3.3 Hydrological information services.	E	smallholder	50,000
Project facilitation			
3.1.1 Climate change management capacity.	E	smallholder	50,000
3.2.1 Resilience research and climate policy dialogue.	E	rural population	720,000

403. In total, the number of primary beneficiaries targeted by *Chosso* asses creation interventions is estimated at 52,450 rural poor people/smallholders (6,556 rural households), comprising 5,500 beneficiaries already within the current scope of *Nema* and 46,950 new beneficiaries (5,869 households) to be targeted under the enhancement interventions. In addition, resilience capacity building and adaptation knowledge management activities will target 35,300 people including 654 within the current scope of *Nema*. To this end, the cumulative total number primary households for *Chosso* investment will be 6,556 of which 689 households are subset of *Nema*'s targeted rural households. Overall, the cumulative *Nema-Chosso* rural households are estimated to be 28,729 households (22,860 for *Nema*, 80% and 5,869 as additional by *Chosso*, 20% by discounting the 689 households from *Nema* that will directly benefit additionally from *Chosso*). The annual and cumulative incorporation of beneficiaries is shown in the following table, categorised by: year; modification or enhancement; primary or intermediate; current *Nema* or *Chosso* addition; and asset creation, capacity building or knowledge management.

Table A10.3: Chosso beneficiary incorporation matrix

Year	2016	2017	2018	2019	2020	Current Nema	Chosso addition	Asset creation	Capacity build/KM
Project year	1	2	3	4	5				
MODIFICATIONS									
Total beneficiaries	0	1,093	1,970	2,074	705				
Cumulative	0	1,093	3,063	5,137	5,842	5,842	0	5,500	342
Primary beneficiaries	0	1,088	1,960	2,064	700				
Cumulative	0	1,088	3,048	5,112	5,812	5,812	0	5,500	312
Intermediate beneficiaries	0	5	10	10	5				
Cumulative	0	5	15	25	30	30	0	0	30
ENHANCEMENTS									
Total beneficiaries	0	19,141	25,082	24,962	13,387				
Cumulative	0	19,141	44,223	69,185	82,572	35,476	47,096	46,950	35,622
Primary beneficiaries	0	18,999	24,942	24,942	13,367				
Cumulative	0	18,999	43,941	68,883	82,250	35,295	46,955	46,950	35,300
Intermediate beneficiaries	0	142	140	20	20				
Cumulative	0	142	282	302	322	181	141	0	322
GRAND TOTAL									
Total beneficiaries	0	20,234	27,052	27,036	14,092				
Cumulative	0	20,234	47,286	74,322	88,414	41,318	47,096	52,450	35,964
Primary beneficiaries	0	20,087	26,902	27,006	14,067				
Cumulative	0	20,087	46,989	73,995	88,062	41,107	46,955	52,450	35,612
Intermediate beneficiaries	0	147	150	30	25				
Cumulative	0	147	297	327	352	211	141	0	352

Approach to economic and financial analysis

404. *Chosso* is adding value to the ongoing *Nema* – the National Agricultural Land and Water Management Development Project – specifically in terms of strengthening both the resilience of its targeted poor communities to the adverse impact of accelerating climate change and the technical and managerial capacity of the project to mainstream adaptation and deliver its ambitious agenda.

405. The economic and financial analysis of *Nema* in 2012 – fully twelve times the project cost of the supplementary *Chosso* – was founded on the forecast incremental rice and vegetable production of smallholders,

“resulting from project investments in public economic infrastructure. Indirect benefits, including the enhanced capacity of public and private institutions involved in the production of and domestic trade in rice and vegetables, resulting from Component 2 *Agricultural Commercialization*, were not valorised in this analysis. The substantial transfer of cash from the public sector into the rural economy through wages during construction was also left aside”.¹⁷

406. *Nema* recognized that the crucial factor driving up yields was and is the impact of off-farm watershed improvements in land husbandry, soil quality and water control resulting from investments in physical and human capital. The projected incremental on-farm returns

¹⁷ *Nema* Project Design Report, Annex 10: Economic and Financial Analysis.

were sufficient to justify the whole project cost of *Nema* without recourse to the significant value added to public goods. Indeed, the sensitivity analysis showed that the *Nema* EIRR would have been sufficiently robust to withstand the full additional cost of the proposed *Chosso*.

407. Overall, *Chosso* aims to promote the climate resilience of the entire rural economy dependent on natural resources. The expenditures on *Agricultural commercialization* (Climate resilience for producers, Capacity building of technical service providers, Climate risk information services, Hydrological information services) and *Project facilitation* (Climate change management capacity and Resilience research and climate policy dialogue) sum to 24.9% of *Chosso* base costs and are all sector-wide in scope.

408. The two substantive components are expected to benefit both a proportion of the existing *Nema* target communities and other communities within the same watersheds.

409. **Modifications.** *Chosso* is concentrating adaptation design modifications on a small proportion of the total area targeted by *Nema*:

- 160 ha (8%) of the 2,000 ha of *Tidal irrigation infrastructure*, principally to pilot an alternative technology;
- 720 ha (5.8%) of the 12,400 ha of *Lowland run-off water control infrastructure*, concentrated on locations with acute saline incursion problems;
- 600 ha (15%) of the 4,000 ha of *Upland water control infrastructure*, which was undertaken primarily for the benefit of producers in the lowlands; and
- 14 of the 30 women *kafo* village vegetable schemes and eight of the 18 youth schemes, being 100% of the total number financed by IFAD.

410. Whereas the tidal irrigation and village vegetable schemes are compact areas and site specific, the lowland and upland water control investments are focused on whole watersheds in which the shared land and water resources are public goods. As such, and particularly with no security of tenure, there is little incentive for individual farmers to look after the soil and water resources but every incentive for whole communities to invest collectively in their own future.

411. In each of the water control modifications, there are direct benefits anticipated from time saved on operation and maintenance and thereby increased return per labour-day. Additional indirect benefits are expected as environmental services, such as additional productive water availability through better management. The *Tidal irrigation infrastructure* investment in the targeted 160 ha of new schemes – the combined *Nema/Chosso* intervention, not *Chosso* alone – is forecast to sequester 8,008 mt of CO₂ equivalent over the economic life of the project, currently valued at USD 40,040, (see below).

412. **Enhancements.** It is proposed to base the economic analysis of *Chosso* on the four significant interventions categorised as “enhancements” of *Nema*, namely: *Community water harvesting*, *Community agroforestry*, *Community woodlots* and *Mangrove restoration*. Together, these comprise 48.9% of total base cost and 65.1% of the *Watershed development* component. As indicated in Table A10.1 above, all four combine potential direct benefits (private goods) with a range of important indirect benefits (public goods) in terms of improvements to the natural resource base upon which production depends. All target those

communities relying on depleted natural resources that are under increasing threat from the negative impact of climate change.

Financial and economic analysis of Chosso.

413. Where possible, financial benefit streams are estimated for incremental productive activities enabled by the investments. These returns to enterprise are then translated into economic values and combined with other – in some cases far greater – economic benefits accruing through enhancements to the productive carrying capacity of the physical landscape. The quantification and valuation of the key physical factors of agriculture – soil quality and moisture control – are problematic given the paucity of pertinent data time series. In this analysis, positive but small environmental service benefits are assumed.

414. Economic analysis was undertaken to calculate the overall benefits of the project to The Gambia and to gauge cost-effectiveness. The main assumptions made are as follow.

415. *Benefit stream:*

- The analysis identifies quantifiable benefits directly related to the project activities.
- Incremental direct benefits (private goods) have been aggregated using the assumptions on number and phasing of beneficiaries described above and in the Excel computations on file.
- Incremental indirect benefits from investments to counter further climate change related deterioration in soil productivity and the control of agricultural water (public goods) have been valorized at nominal rates.
- No financing flows are included in the calculations as they are already reflected in the project costs in the form of cofinancing and beneficiary contributions.
- Benefits would be realized gradually from project year 2016 and achieve full development in year 2021.
- For each activity model, 100% of minimum benefits are forecast with an appropriate time lag: the year following water harvesting infrastructure completion; three years after agroforestry and mangrove restoration investments; and 2-4 years after woodlot establishment.

416. *Costs stream:* economic costs are net of transfers, duties, taxes and price contingencies, but inclusive of physical contingencies. In order to avoid double-counting of costs, investment items included in the models that are to be provided by Chosso have been deducted from the overall economic costs. Total economic cost of the project amounts to USD 5.15 million.

417. *Shadow prices:* a Standard Conversion Factor (SCF) of 0.85 was applied to all items to adjust financial prices to economic by removal of Value Added Tax (VAT), and for labour to account for the high unemployment and underemployment rates present in the target communities. Derivation of financial and economic prices, as well as key parameters, are shown in the Excel computations on file.

Community water harvesting

418. The basic rationale for the *Community water harvesting* activity is to provide supplementary water supply to a community for any chosen productive use during the dry

season. Various water capture/storage technologies are proposed for piloting by Chosso as deemed most suitable for local conditions: *Trench storage* with a nominal storage/supply capacity of 1,500 m³; *Earth dam storage* (4,500 m³); *Run-off structure catchment* (2,500 m³); and *Barrage saline water barrier* (800 m³ from continuous flow). The availability of water would enable one or more community income-generating activities on a small scale through the dry season, such as horticulture, small-stock raising or non-agricultural enterprises. The choice would be made by recipient communities within their natural resource planning processes.

419. As a guide to likely returns, the production of off-season vegetables is assessed. The intensive vegetable (onion and tomato) production models projected by Nema indicated a gross margin of USD 6,610/ha. Assuming that the activity with less intensive production technology on a 0.5 ha plot would require 250 m³ of water through the dry season, the net return to the operators is estimated at USD 2,000/ha or USD 4/m³ of water for a single dry season crop, the net return to the operator is estimated at USD 1,200/ha or USD 2.40/m³ of water. This level of return is assumed for any productive activity enabled by the availability of water.

420. Such estimated returns to enterprise would indicate a positive FIRR for each of the four infrastructure types: *Trench storage* 7.5%, *Earth dam storage* 11.2%, *Run-off structure catchment* 11.4% and *Barrage saline water barrier* 13.8%. The indicative programme of 24 structures in combination yields an FIRR of 10.1%.

421. In economic terms, the creation of environmentally sound productive assets under communal management is included as a benefit stream, valued at 0.5%/year of the investment cost of the installed water harvesting structures, an average of USD 168/year/community. In addition, the environmental services generated by the infrastructure are value at USD 0.05/m³ of water captured/stored.

422. The combined benefit streams yield adequate EIRRs: *Trench storage* 12.2%, *Earth dam storage* 18.6%, *Run-off structure catchment* 18.7% and *Barrage saline water barrier* 19.9%. The indicative water harvesting programme shows an EIRR of 16.4%.

Community agroforestry

423. Community agroforestry comprises tree planting and forest management around settlements, in natural or regenerated forests and to consolidate water control structures in the “buffer zone” between uplands and the lowland farming areas. The direct benefits anticipated from investing in the commons include access to fuelwood, fodder, honey, fruits and medicinal plants. In financial analysis, the combined value of these benefits to a community is estimated conservatively at USD 105/ha/year, yielding an FIRR of 4.7%.

424. However, the main justification for the activity lies in the multiple indirect benefits derived from the restoring the physical landscape, including the recovery of degraded land, reduced pressure on natural resources, agro-biodiversity restored, increased rainwater infiltration with associated effects on groundwater levels, reduced soil erosion (affecting soil quality) and river sedimentation, the creation of shade and windbreaks, and a modest level of carbon sequestration. These public goods all contribute to the reversal of the falling trend in the economic carrying capacity of the watersheds, which is symbolised by the huge cumulative losses in tree and plant cover in living memory and is very well understood by farmers in terms of their declining yields and returns to effort in agriculture, livestock and fisheries. Incremental natural resource assets valued at 3% of investment costs and

environmental services at USD 18/ha; the combined value of these benefits is estimated very conservatively at USD 36/ha/year. In addition, *Community agroforestry* investments are expected to generate a total of 2,475 mt of CO₂ equivalent sequestered over the life of the project, with carbon offset value of USD 12,375, an average of USD 1.46/ha/year¹⁸. The combination of private and public good benefit streams yields an EIRR for *Community agroforestry* of 12.6%.

Community woodlots

425. The establishment of *Community woodlots* is justified mainly by the direct benefits accruing to the owner/operators as income from timber and wood products, and/or fuelwood and provisioning benefits. The experience of the more successful woodlots in The Gambia suggests that the investments will be managed flexibly for multiple purposes. In theory, a timber-only model would generate a harvest of 400 poles/ha valued at USD 1,524 each five years and a fuelwood-only model would generate an annual *Gmaligna* offtake of 30 m³/ha valued at USD 714 from the third year onwards. In addition, provisioning benefits (honey, fruits) valued at USD 90/ha/year would be anticipated from the third year onwards. For purposes of analysis, a hybrid 1 ha model is presented comprising 0.5 ha timber and 0.5 ha fuelwood plus other provisioning benefits. The estimated FIRR of such a woodlot is 8.6%.

426. In economic analysis, *Community woodlots* are expected to contribute a range of public good benefits including: physical community assets created (2%/year of investment cost); and reduced tree cutting, agro-biodiversity restored, increased rainwater infiltration with associated effects on groundwater levels, reduced soil erosion (affecting soil quality) and reduced river sedimentation (valued at USD 12/ha/year). These environmental services are estimated at a nominal USD 78/ha/year from the third year onwards.

427. The value of the total carbon offset for the proposed woodlots has been calculated at USD 64,120 over the 17-year period, averaging 10.06 mt/ha/year of CO₂ equivalent sequestered, valued at USD 50.29/ha/year.

428. The combination of private and public goods accruing from 75 ha of *Community woodlots* yields an EIRR of 15.5%.

Mangrove restoration

429. *Mangrove restoration* is the signature investment of Chosso in responding to climate change, with almost a quarter of the total project budget committed to the activity. It combines substantial direct benefits in terms of income to communities nearby and a range of indirect benefits in environmental services, restoring the complex bio-diversity and natural defences against salinity and damage to the river margins.

430. The principal direct benefit from *Mangrove restoration* is the return of river fish and oyster stocks available for sustainable harvesting. Gambian experience has shown that, at full development from a zero base, 1 ha of healthy mangrove can support a fish offtake (tilapia) of up to 30 mt/year, valued at USD 30,000, and an oyster harvest of 0.6 mt/year, valued at USD 1,800. Net of production costs, these activities could generate incomes of USD 241,000/ha and USD 540/ha respectively. Taking a very conservative view of the catch prospects in open waters, a fish offtake of 0.5 mt/ha/year is adopted along with an oyster offtake of 0.6 mt/ha/year for this analysis. Additional benefits are expected from fuelwood

¹⁸ Carbon sequestration numbers over a 17-year period have been generated using the EX-Act tool of FAO. It is notable that the equivalent value per hectare is 35-times greater for the woodlot and mangrove development investments below.

and building materials from the mature mangroves, valued at a nominal USD 25/ha/year. In combination, these benefit streams yield a FIRR of 12.0%.

431. The public good benefits accruing to *Mangrove restoration* include physical community assets restored (1%/year of investment cost) and a range of natural resource benefits: the restoration of fish and oyster stocks, protected river margins in perennially and seasonally saline areas and river biodiversity restored, estimated at USD 24/ha/year. Together, these environmental services are valued at a nominal USD 150/ha/year.

432. In addition, carbon sequestration over the life of the project is calculated at 102,592 mt CO₂ equivalent (valued at USD 512,960), comprising 81.5% of the total carbon offset predicted for *Chosso*.

433. In combination, these benefits yield an EIRR for *Mangrove restoration* of 20.0%.

Economic analysis at project level

Economic analysis. The base case scenario for a 17 year period of analysis for the main four *Chosso* interventions shows an Economic Internal Rate of Return (EIRR) of 18.1% and a Net Present Value (NPV) of USD 1.2 million, discounted at 10%. The estimated EIRR is satisfactory for a supplementary project of these characteristics and can be considered very conservative.

434. *Sensitivity analysis and switching values.* A sensitivity analysis was conducted to assess the effect of variations in benefits and costs (up to 50% cost increase, 20% benefit increase and 30% benefit decrease) and for lags in the realisation of benefits (one or two years). All these scenarios yielded EIRRs ranging from 9.0% to 22.7%. The switching value for the total project benefit is about 27% while for the project cost it is approximately +38%. Results of the sensitivity analysis are shown in Table A10.4.

Table A10.4: Summary of *Chosso* EIRR under various scenarios

	Base case	Costs increase			Benefits increase		Benefits decrease			Delay of benefits	
	-	+10%	+20%	+50%	+10%	+20%	-10%	-20%	- 30%	1 year	2 years
EIRR	18.1%	15.8%	13.8%	9.0%	19.0%	22.7%	15.6%	12.9%	10.0%	14.8%	12.6%
NPV (USD)	1,198,730	888,455	578,180	-352,645	1,307,476	2,059,026	768,582	338,434	-91,714	635,548	126,225

Notes: 17-year analysis, 10% discount rate.

Appendix 11: Draft Project Implementation Manual

Nema's PIM is being updated to reflect *Chosso* specificities.

Appendix 12: Compliance with IFAD policies

435. As with the design of the *Nema*, *Chosso* design is aligned to all relevant IFAD strategies and policies, including:

- Strategic Framework 2011-15;
- Targeting Policy – Reaching the Poor (2010);
- Gender Strategy;
- Climate Change Strategy (2010);
- Environment and Natural Resource Management Policy (2011);
- Policy on Supervision and Implementation Support; and
- Social, Environmental and Climate Assessment Procedures.

436. Of these, the recent *Environment and Natural Resource Management Policy: Resilient livelihoods through the sustainable use of natural assets* has particular significance for the subject project. The policy distils lessons learnt in previous IFAD initiatives that have sought to reduce rural poverty through interventions related to the environment. The ten core principles encapsulate both the core issues to be addressed and suggested approaches.

IFAD ENRM policy: summary of core principles

IFAD will promote:

1. Scaled-up investment in multiple-benefit approaches for sustainable agricultural intensification.
2. Recognition and greater awareness of the economic, social and cultural value of natural assets.
3. 'Climate-smart' approaches to rural development.
4. Greater attention to risk and resilience in order to manage environment- and natural-resource-related shocks.
5. Engagement in value chains to drive green growth.
6. Improved governance of natural assets for poor rural people by strengthening land tenure and community-led empowerment.
7. Livelihood diversification to reduce vulnerability and build resilience for sustainable natural resource management.
8. Equality and empowerment for women and indigenous peoples in managing natural resources.
9. Increased access by poor rural communities to environment and climate finance.
10. Environmental commitment through changing its own behaviour.

437. Also important in this context is the *Chosso* alignment to the Climate Change Strategy goal maximising IFAD's impact on rural poverty in a changing climate and precisely relevant to two statements purpose: to support innovative approaches to helping smallholder farmers build their resilience to climate; and to inform a more coherent dialogue on climate change, rural development agriculture and food security.

IFAD's Strategic Framework.

438. **Targeting.** In order to ensure project benefits reach IFAD's target group, target groups have been defined. *Nema's* targeting strategy would be updated include the specific climate adaptation measures and will be further reflected in project design and implementation modalities. The latter includes: geographic targeting to climate vulnerable communities; self-targeting as related to economic opportunities and empowerment; and capacity building, (see Appendix 2).

Table A12.1 Gender checklist

Gender checklist	Comments
1. The project design report contains – and project implementation is based on – sex-disaggregated poverty data and an analysis of gender differences in the activities or sectors concerned, as well as an analysis of each project activity from a gender perspective to address any unintentional barriers to women's participation.	Some data is presented for vulnerability to climate change, which can be extrapolated to the target group based on common observations about gender and youth inequality.
2. The project design report articulates – or the project implements – actions which aim to: <ul style="list-style-type: none"> expand women's economic empowerment through access to and control over productive and household assets; 	Yes, through climate change sensitisations and trainings on climate resilient agricultural practices and supporting women and youth to participate in the management of communal resources. The project will expand access to technologies through water harvesting structures and the end-to-end irrigation to 14 of the 30 women's groups. Knock-on impacts on time and energy levels to achieve productivity in other areas will be monitored.
<ul style="list-style-type: none"> strengthen women's decision-making role in the household and community, and their representation in membership and leadership of local institutions; and 	The participatory planning approach is led by the gender and youth structures and this process is expected to expand their decision-making role and to lead to adaptation strategies that reflect the needs and priorities of the target group. Co-producing agricultural extension messaging linked to short-range and seasonal forecasting with farmers, aimed at improve agricultural decision-making, is likely to create robust, user-friendly and user-driven decision-support tools, methods and messaging.
<ul style="list-style-type: none"> achieve a reduced workload and an equitable workload balance between women and men. 	Allocation of micro-jet irrigation technology for the vegetable gardens is a key way of reducing the drudgery for women. Knock-on impacts on time and energy levels to achieve productivity in other areas should be monitored. Heath impacts in rice growing areas in particular will be monitored to determine changes in the burden of illness among women, which can help to better define the adaptation responses in future programming.
3. The project design report includes one paragraph in the targeting section that explains what the project will deliver from a gender perspective.	Yes.
4. The project design report describes the key elements for operationalizing the gender strategy, with respect to the relevant project components.	Yes.
5. The design document describes - and the project implements - operational measures to ensure gender-equitable participation in, and benefit from, project activities. These will generally include:	
5.1. Allocating adequate human and financial resources to implement the gender strategy.	Gender is included in the ToR for all the project management officers. Climate risk and gender training is recommended for project staff.

Gender checklist	Comments
5.2. Ensuring and supporting women's active participation in project-related activities, decision-making bodies and committees, including setting specific targets for participation.	Gender focal points in the MDFTs will be trained and equipped in participatory, climate change planning methods, to lead the sensitisations at the level of women and youth in order to develop group positions before taking these to plenary discussion.
5.3. Ensuring that project management arrangements (composition of the project management unit, terms of reference for project staff and implementing partners) reflect attention to gender equality and women's empowerment.	See 5.1 above for more details.
5.4. Ensuring direct project outreach to women (for example through appropriate numbers and qualification of field staff), especially where women's mobility is limited.	Climate change sensitisations and trainings on climate resilient agricultural practices will be targeted on women's and youth groups through gender and youth structures and minimum quota levels implemented by <i>Nema</i> .
5.5. Identifying opportunities to support strategic partnerships with government and other development organizations for networking and policy dialogue.	Strategic partnerships will be established with youth and women's associations to strengthen their capacity and enhance their visibility.
6. The project's logical framework, M&E, MIS and learning systems specify in design – and project M&E unit collects, analyses and interprets sex- and age-disaggregated performance and impact data, including specific indicators on gender equality and women's empowerment.	Yes.

Table A12.2: Targeting checklist

Targeting checklist	Comments
1. Does the main target group - those expected to benefit most- correspond to IFAD's target group as defined by the Targeting Policy (poorer households and food insecure)?	Yes. See Working Paper 1 on Poverty, Gender and Targeting and Appendix 2.
2. Have target sub-groups been identified and described according to their different socio-economic characteristics, assets and livelihoods - with attention to gender and youth differences? (See matrix on target group characteristics.)	Socio-economic characteristics, assets and livelihood characteristics of the project's primary target group are described in Working Paper 1 and Appendix 2, including their key gender-related constraints.
3. Is evidence provided of interest in and likely uptake of the proposed activities by the identified target sub-groups? What is the evidence? (See matrix on analysis of project components and activities by principal beneficiary groups.)	Consultations with women's groups during the project concept phase and the design phase confirmed the interest of these groups to reduce the workload and drudgery associated with manual watering of vegetable beds, as well as the livelihood benefits of the water harvesting structures. They also indicated full ownership of water control structures under <i>Nema</i> , and the capacity development work streams such as the functional literacy classes.
4. Does the design document describe a feasible and operational targeting strategy in line with the Targeting Policy, involving some or all of the following measures and methods:	
4.1. Geographic targeting – based on poverty data or proxy indicators to identify, for area-based projects or programmes, geographic areas (and within these, communities) with high concentrations of poor people.	Yes.
4.2. Direct targeting - when services or resources are to be channelled to specific individuals or households.	Yes.
4.3. Self targeting – when goods and services respond to the priority needs, resource endowments and livelihood strategies of target groups.	The <i>Nema</i> project will operate country-wide, on a demand-driven basis.
4.4. Empowering measures - including information and communication, focused capacity- and confidence-building measures, organisational support, in order to empower and encourage the more active participation and inclusion in planning and decision making of people who traditionally have less voice and power.	The co-production of weather and seasonal forecast and extension messages with women and youth groups which is more likely to create robust, user-friendly and user-driven decision-support tools, methods and messaging. The gender and youth technical structures will be engaged to work directly with their constituencies on adaptation and in so doing enabling appropriate means and interpretations to be extended to the target groups.
4.5. Enabling measures –to strengthen stakeholders' and partners' attitude and commitment to poverty targeting, gender equality and women's empowerment, including policy dialogue, awareness-raising and capacity-building.	The project will include at its core an emphasis on experiential learning, strengthening the evidence-base through commissioning of a hydrological and climate change risk assessment as an input into the adapted infrastructure design.

Targeting checklist	Comments
4.6. Attention to procedural measures - that could militate against participation by the intended target groups.	The project applies eligibility criteria for selecting women and youth groups such as minimum quota for access to vegetable schemes and a scoring card for awarding access to the grant scheme to avoid elite capture.
4.7. Operational measures - appropriate project/programme management arrangements, staffing, selection of implementation partners and service providers.	A Climate Change Adaptation Officer (CCAO) will be recruited to spearhead the mainstreaming of climate change adaptation in <i>Nema</i> . Gender is included in the ToR for all the project management officers. Climate risk and gender training is recommended for project staff.
5. Monitoring targeting performance. Does the design document specify that targeting performance will be monitored using participatory M&E, and also be assessed at mid-term review? Does the M&E framework allow for the collection/analysis of sex-disaggregated data and are there gender-sensitive indicators against which to monitor/evaluate outputs, outcomes and impacts?	Yes.

Appendix 12.1: SECAP Review Note

Title of Programme/Project: Strengthening Climate Resilience of the National Agricultural Land and Water Management Development Project – Chosso

Introduction

439. **The Chosso** aims to enhance the climate resilience of the National Agricultural Land and Water Development Project (*Nema*) beneficiaries. The *Nema* is implemented nationwide, however the *Chosso* will focus on specific subcomponents and their related activities based on the vulnerability assessments and the need to target strategically the limited resources to activities with potential for higher impact. This review note thus mainly covers the locations and beneficiaries of the key subcomponents outlined in Section II C of the PDR. The bulk of the investments under the *Chosso* will be in two of the six regions in The Gambia, the Lower River (LRR) and the Upper River Regions (URR). As an Environmental and Social Management Plan (ESMP) has already been developed for the *Nema*, this review note will focus mainly on the climate risks analysis and the related management measures being introduced by the *Chosso*.

1. Major landscape characteristics and issues

440. The LRR has the largest patch of savannah woodland in The Gambia and dense mangrove belts and numerous creeks. It also has some of the least populated districts due to the dense vegetation cover in some locations. The soils in LRR are a mixture of continental terminal soils in areas with upland conservation and alluvial plains close to the river. Alluvial soils are characteristically found in the lowlands, are often saline and dominated by mangrove vegetation.

441. The URR has three broad classes of vegetation cover, flood plain shrub savannah confined to the River Gambia valley, shrub savannah on thinner soils outside the flood plains and savannah woodland where the elevation is between 20-30 metres above sea level. The dominant species in each of these vegetation classes owe much of their pre-eminence to fire, and drought resistant characteristics. Continental terminal soils dominate in URR as most locations are upland. These soils are characteristically well drained and of low fertility compared to the alluvial soils. At the surface, they are usually sandy and loamy while the subsoil horizons are generally sandy clays though loamy sand and clay frequently occur in some locations.

442. In terms of demographics, women account for 58% of the population in LRR and 47.2% of these are economically active. In the URR, women account for 51% of the population and 50.2% of these are economically active, (*Nema* ESMP, 2013). Additional information on poverty, gender and vulnerability analyses is provided in Appendix 2 of the PDR. The main livelihood of the communities in both regions is agriculture particularly cultivation of rice as the staple and other crops such as groundnuts and cereals cultivated in the uplands. Vegetables are often grown during the dry months in locations where water is available. Fishing is also a common activity practiced by men with women as processors and sellers. Remittances from relatives abroad and in urban centres also constitute an important source of livelihoods for many people in these communities. Some communities also engage in salt mining, charcoal and timber production, fire wood and wild fruits' collection and small-scale microcredit activities and petty trading, (*Enhancing resilience of vulnerable coastal areas and communities to climate change* project report, UNDP/GEF; Livelihoods study report, LDCF 2014).

443. The key issues some of which are discussed in subsequent sections are land degradation resulting from practices such as deforestation and increased soil erosion, sedimentation, salinity,

declining soil fertility, limited agricultural productivity linked to the low asset base, climate variability and adverse impacts of climate change. The social and environmental issues are discussed in the *Nema* ESMP.

2. Potential projects social, environmental, and climate change impacts and risks

444. The mangroves in LRR could suffer stress due to sea level rise and reduced salt flushing arising from natural and regulated freshwater inflows. Species such as *Rhizophora spp* and *Laguncularia racemosa*, which are slow moving and threatened, could disappear locally. Climate change is expected to have minimal impact on vegetation based on the resilience of savannah woodland and anomalous vegetation patterns along the Bintang Bolon. However, farming and animal husbandry, which constitute a source of livelihood for over 60% of the population, could be adversely affected by erratic rainfall patterns, contraction of shrub savannah and bush fires. Mangrove losses and changes in the hydrological regime of bolons and the River Gambia will have an adverse impact on the artisanal fishing. These impacts could be compounded by sediment mobilised by crosscurrents from submerged barren flats. The region also has a meeting point for the national highway, Soma, where high mobility increases the risk of infectious disease outbreaks (NAPA, 2007).

445. Climate change may alter vegetation patterns and associated faunal species in the URR. In high elevation frontier areas dominated by shrub savannah, erratic rainfall and higher temperatures may constrain the survival of annual species. These are likely to be replaced by grasses and species with higher tolerance of environmental stress. Habitat loss would compound the threat to species normally associated with shrub savannah. Medicinal plants and valuable grazing may be lost in the transformation process. Subject to the degree to which annual floods are downgraded by flow regulation, sea level rise may compound flooding problems in some locations. Torrential and unseasonal rains are also likely to affect agricultural production adversely. In general, inter-annual variability of crop yields is expected to increase. Extensive flooding and high temperatures also make outbreaks of infectious disease more likely (NAPA 2007).

446. The flows in the River Gambia and advancement of the saline front will be impacted by the construction of the Sambangalou dam for hydropower supply, about 470 km upstream at the border with Senegal. The dam is expected to create artificial floods (once or twice a year) for ecological purposes such as to minimise the adverse impacts of the resultant reduction of flooded wetland areas. In effect, the potential area for irrigation as identified in the GNAIP will be reduced. The dam is expected to bring an additional advantage in maintaining a steady low water flow during the dry season and thus push the saline front further West, (Water Resources Assessment and Management Strategy, 2015). A full ESIA has been conducted for the power supply project, which identifies more benefits than adverse impacts and includes recommendations to minimise the impact of the latter.

447. According to the local hazard mapping and zoning exercise conducted jointly by several agencies in 2014 including the National Disaster Management Agency, the main natural hazards in LRR are bush fires, soil erosion, windstorms, salt-water intrusion and flooding. The main agricultural hazards were identified as deforestation, livestock diseases and *quela quella*. The main natural hazards in URR are droughts, bush fires, soil erosion, windstorms and flooding while the main agricultural hazards were identified as livestock diseases and pest invasion.

448. The measures included in the project for the management of some of these aforementioned risks are summarised in section six on recommended features of the design and detailed in Section IIC of the PDR. No specific measures have been included for managing

livestock diseases and pest invasions partly because other interventions are addressing some of these risks and partly to keep a focused approach to maximise the impacts from available *Chosso* resources.

3. Environmental and social category

449. In accordance with the National Environment Management Act (NEMA), 1994, of The Gambia agricultural development projects such as *Nema* fall under 'Class A' category and thus require an Environmental and Social Impact Assessment (ESIA) to be undertaken. An ESMP was developed by the National Environment Agency as a result of the ESIA. The ESMP includes clear plan of actions, stipulating specific activities to be undertaken to ensure mitigation measures for significant negative impacts are duly implemented in order to integrate environment and social issues of the projects with existing programmes and activities. The development of the ESMP was largely based on a field survey to selected project intervention sites throughout country where interviews, focused-group meetings and field sites visits, where necessary, were conducted.

450. However, using the IFAD Environment and Social assessment Procedures (which have been revised into the SECAP) *Nema* interventions were classified as Category B based as they are aimed at rehabilitating already fragile and damaged ecosystems. The *Chosso* investments will follow the same categorisation as *Nema*, B, as they are additional resources targeted at some of the *Nema* activities with the addition of piloting water-harvesting infrastructure. The ESMP developed for the *Nema*, which is still relevant and valid, will be revised to incorporate additional elements from the *Chosso*. Most of these elements are expected to result in positive impacts both for the environment and for the social status of the beneficiaries. The National Environment Agency (NEA) will undertake the revision of and maintain the responsibility for monitoring the implementation of the revised ESMP.

4. Climate risk classification

451. The climate risk classification is moderate. The project outputs and outcomes will be impacted by climate. However, adaptation measures will form the main project activities. Some information exists on the key climate risks being faced such as droughts, floods, dry spells and salinity. Measures have been included as part of this project targeted specifically at addressing these climate risks and build the resilience of the beneficiaries. Further information to map the progression of the saline front and to model the hydrological impact of water and salinity control infrastructure could enhance the design.

5. Further information required to complete screening, if any

452. As the *Chosso* provides additional resources to the *Nema*, adequate information is available to complete the screening.

6. Recommended features of project design and implementation

453. The following measures are the key sub-components of *Chosso* aimed at addressing environmental, social and climate related risks (Section II C of the PDR).

454. **Improving Watershed planning.** The existing village planning will be enhanced to ensure a more watershed-based approach with the interdependency of neighbouring villages well-articulated. Community based adaptation tools will also be promoted and training provided in their use particularly for the Multi-Disciplinary Facilitation Teams. The village action plans are developed on a rolling basis under *Nema*, with 25 as an annual total. *Chosso* adopted the *Nema*

phased approach in the developing of plans, which will enable learning and refinement of the watershed management activities.

455. Enhancement of infrastructure design. This will be done using a two-pronged approach. The standard designs provided by the Soil and Water Management Unit will be reviewed and revised based on the assessment of the climate related risks such as floods. The main revisions will be on the material recommended for the construction and the slope ratios for dikes. Drainage capacity and specifications will also be revised. In addition to the revision of standard designs, the *Chosso* will improve the robustness of the infrastructure in some of the *Nema* locations using the revised standards.

456. Water harvesting infrastructure. *Chosso* will pilot small-scale water harvesting infrastructure, particularly in the uplands. The structures will increase the availability of water for productive use during the dry months and thus be a means of reducing the impact of droughts. The small-scale nature of these structures minimise any adverse impacts that may result from water storage. However, decision making in the siting of the pilot structures and the use of the water resources to be provided will need particular attention to ensure equal access for all potential users.

457. Use of microjet sprays. This will increase the efficiency of water use in the vegetable gardens and reduce the time spent on watering thus freeing up time for other productive activities for the women and youth. Training in the use of the spray technology and the management of tidal irrigation schemes will also be provided to the target beneficiaries. The location of vegetable gardens is decided by the community and included in the village action plans. Often virgin land earmarked for agricultural production is allocated and so consideration needs to be given to the potential impacts on biodiversity and the environment and appropriate measures be included to minimise any adverse impacts, such as selective clearing of mainly the grass and maintaining the trees found in the location.

458. Mangrove restoration. The mangroves will minimise soil erosion and the resulting siltation of riverbeds as well as buffer the creeping salt water that renders productive lands acidic and unsuitable for their traditional use of growing rice. The mangroves will also enhance the biodiversity of the locations particularly in view of their use as fish spawning areas.

459. Agroforestry and community forestry. These activities will provide additional income sources for the communities as well as have a positive impact on the microclimate. The species selected for these activities will be important and need to take into consideration the targeted beneficiaries' equal access to the potential incomes.

460. Timely climate information. Given the increased climate variability in terms of onset, duration, intensity and cessation of rains, improved dissemination of climate and weather information will result in informed planning at farm level. Farmers will be able to make more informed decisions on varieties and crops to plant, labour requirements and their timing, and the areas to place under cultivation.

461. Capacity building of service providers and farmer groups. The capacity of the service providers will be enhanced to ensure they are able to deliver on the revised standards of the infrastructure in a timely manner. Existing service providers will be encouraged to include irrigation engineers in their teams. The capacity of the farmer groups will be strengthened to adopt climate resilient practices that will be promoted through the Farmer Field Schools and the Functional Literacy Programme concerning useable climate information.

7. Discuss the various alternatives including environmental objectives and reasons for choosing the best option.

The alternatives considered included the following:

462. Upgrading of the infrastructure to installed under the *Nema* thus making it more robust in the face of climatic events. The targeted infrastructure included dikes, drainage systems, access bridges and causeways. However, the *Chosso* has limited resources and thus not all the infrastructure could be included. It was also noted that the infrastructure would be improved progressively as the *Nema* is implemented based on evidence from predecessor projects. Thus, the *Chosso* resources will be targeted at the revision of standard designs and piloting of the revised standards. The piloting will reduce the time for the progressive improvement of the design and inform future project designs.

463. Dissemination of improved varieties such as drought, flood and salt tolerant ones. It was acknowledged that farmers are already using improved varieties particularly the early maturing ones. Thus these varieties are already available on the market albeit not systematically. The value addition from *Chosso* could be improvement of the systems for the dissemination of locally certified improved varieties and ensuring the timely access by the farmers. The use of improved varieties will be included in the package of climate resilient practices to be promoted in the farmer field schools.

464. Aquaculture was proposed as a potential climate change adaptation measure with the aim of livelihood dissemination. Though not included specifically under the *Nema*, communities where infrastructure is being installed are requesting to make use of some pits remaining after the works as fishponds.

465. Insurance was also proposed as a risk management measure particularly for droughts. Though there has been some experience with micro-insurance schemes, this option was considered not readily implementable for the *Chosso* particularly as the *Nema* is already under implementation and thus more readily applicable adaptation options were prioritised.

466. Use of ground water from the lower aquifer was proposed for consideration. However, this would require information on the recharge rates for the aquifer and the potential cost implications of using the ground water for irrigation in vegetable gardens may not be justifiable.

8. Analyse the environmental decision-making chain of command to include other sectors that are key actors in environmental management.

467. The approach proposed under the *Chosso* is to support the participatory watershed planning and sensitize the communities on the impacts of climate change as well as provide options for community based adaptation and climate resilient agricultural practices, (such as agroforestry, crop diversification, water conservation techniques among others). The communities will also be provided with improved climate information and thus be able to make informed decisions that benefit them as individuals at the farm level and their groups or communities.

468. The *Chosso* is financed through the Adaptation for Smallholder Agriculture programme (ASAP) and will be implemented by the *Nema* Project Support Unit (PSU). Additional capacity will be provided to the PSU; a Climate Change Adaptation Specialist will be recruited. The expert will work closely with the existing climate change expertise in the Department of Water Resources, Department of Meteorological Services and the National Environment Agency.

469. Training has been included for the MDFTs that conduct participatory needs assessments and engage with communities to develop action plans to address key identified challenges. The

MDFTs will be trained in the use of community based adaptation tools Identify who would be responsible for the various activities. Farmer field schools and the functional literacy programme being conducted as part of the *Nema* will also incorporate climate change adaptation in their curricula and climate information respectively.

9. This section should include M&E recommendations.

470. The *Nema* M&E system has already been developed with an embedded participatory monitoring approach and will be updated to include the key indicators that need to be monitored under the *Chosso*. The indicators to be monitored are included in the logframe. GPS coordinates will be particularly beneficial in the monitoring of the agroforestry and community forestry activities.

10. Record of consultations with beneficiaries, civil society and general public

471. Consultations were held during the detailed and final design missions (respectively 26 January - 13 February and 20 April – 1 May 2015) mainly with beneficiaries. Further consultations will be held during the updating of the *Nema* ESMP to include the *Chosso* activities and the related sites. The update is envisaged within the first year of implementation of the *Chosso* when sites will be decided for additional activities such as water harvesting.

Guiding questions for climate risk screening

Question	Yes	No	Additional Explanation of 'Yes' response
Is the target group of the project dependent on climate-sensitive natural resources (such as drought-prone crops, rainwater-fed agricultural plots, migratory fish stocks)?	√		The target group is dependent on rainfed agriculture.
Has the project area been subject to extreme weather events in the past, such as flooding, drought, tropical storms or heat waves?	√		Droughts have occurred recently 2011/12 and 2013/14.
Could changes in temperature, rainfall or extreme weather affect the project impact, sustainability or cost over its lifetime?	√		Floods are likely to damage some infrastructure if measures are not taken.
Will climate variability likely affect agricultural productivity within the project (crops/livestock/fisheries) or incidence of pests and diseases?	√		The late start and early finish of the rains is already having adverse impacts.
Would weather-related risks or climatic extremes adversely impact upon key stages of identified value chains in the project (from production to markets)?	√		Most of the impact will be on the production stage for rice and vegetables.
Does the project have potential to integrate climate resilience measures without extensive additional costs (such as applying improved building codes; expanding capacity-building programmes; or including climate risk issues in policy processes)?	√		Some of these measures have been proposed in the project.
Would the project benefit from a more detailed climate risk and vulnerability analysis to identify the most vulnerable rural population, improve targeting and identify additional complementary investment actions to manage climate risks?	√		This project was based on the climate risk analysis done on the <i>Nema</i> project.

Appendix 13: Contents of the Project Life File

Project Concept Note (11 December 2014).

OSC Minutes of Project Concept Note (15 December 2015).

Detailed Design Mission Aide Memoire (16 February 2015) including list of attendees at
Chosso design multi-stakeholder's national validation workshop (11 February 2015).

Detailed Design ToR.

*IFAD in The Gambia: Amplifying Smallholder's climate resilience for a better tomorrow,
ASAP-Nema PowerPoint presentation during First National Stakeholder's Design
Workshop, 11 February 2015, Red Croc Hotel, Banjul, The Gambia.*

*IFAD in The Gambia: Amplifying Smallholder's climate resilience for a better tomorrow,
ASAP-Nema PowerPoint presentation during Second National Stakeholder's Design
Workshop, 30 April 2015, Baobab Hotel, Banjul, The Gambia.*

COSOP September 2003.

Draft Detailed Design Report and Appendices.

Chosso Working Papers:

WP 1: Poverty, Targeting and Climate Change.

WP 2: Agricultural Water and Rural Infrastructure.

WP3: Crop, Mangrove and Trees agronomical aspects.

WP4: Institutional and Capacity Building.

WP5: Project Costs and Financing (COSTAB).