

## Logframe Integrated Flood Risk Management in the Nadi River Basin

Output No.	Output	Key Indicators	Means of Verification	Assumptions/Risks	Action Origin
	<b>Project Goal</b> To improve flood preparedness and integrate land and water management planning within the Nadi Basin using an integrated flood risk management approach	A high level of flood risk preparedness, reflected through an integrated flood risk management plan, developed through community engagement, incorporating a flood warning system based on sound modelling of reliable data, an enabling policy and financial framework, a catchment wide planning strategy and increased technical and institutional capacity	Wide area consultation with community for better understanding of flood process and through consultation, a development of Integrated Flood Risk Management that integrate land and water management which can improve communities preparedness	Non Commitment and wide range of participation at community level for the development of Integrated Flood Risk Management	PMU / LWRM
	<b>PURPOSE</b> Improved catchment resilience to flood impacts and better flood preparedness and management within the Nadi Basin	Development of an integrated flood management plan and mainstreaming into policy, planning and legislation framework	Integrated flood risk management plan	Effective control and monitoring of river basin development, enabling policy and legislation	PMU
	<b>COMPONENT 1</b>				
1	<b>Development of Integrated flood management plan and mainstreaming of integrated flood management into policy, planning and legislation framework</b>	An integrated flood risk management plan within an enabling policy and financial framework	An integrated flood risk management plan developed into a policy paper	Capacity to influence political process: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel	NDMO, FMS, WAF, NBCC
	<b>Output</b>				
1.1	Review legislative requirements to enable integrated flood management within national IWRM framework	Changes to national legislation and water resource policy to mainstream IWRM including integrated flood risk management	Promulgated Legislation and Policies	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Capacity to influence political process: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation; capacity to attract/retain suitably qualified personnel	EU Co-financing
	<b>Indicative Activities</b>				
1.1.1	Review legislative requirements for integrated flood management within IWRM	Report recommending strategies for mainstreaming IWRM into national legislation and/or policies	Acceptance by Interim National Water Committee		EU Co-financing
1.1.2	Develop draft legislation and/or policies as identified in review to improve integrated flood management	Draft Legislation and Policies tabled in Cabinet	Cabinet Decision		SG
1.1.3	Develop and implement strategy for endorsement by Cabinet to mainstream integrated flood management into legislation and national policy	Support for draft legislation and/or policies tabled in Cabinet Legislative support for Catchment Committees	Promulgated Legislation and Policies		MPI
	<b>Output</b>				
1.2	Review institutional arrangements for government administration of water resources	Clear roles and responsibilities in water resource management across government			
	<b>Indicative Activities</b>				
1.2.1	Review institutional arrangements for IWRM to provide enabling environment for integrated flood management	Report to government providing options for improving government IWRM and flood management administrative arrangements	Accepted by Interim National Water Committee		LWM/ MRD
1.2.2	Make recommendations to the Government of Fiji on the institutional arrangements for IWRM and possible management agencies				
	<b>Output</b>				
1.3	Develop Nadi Basin Flood Management Plan - An integrated flood risk management plan developed through community engagement, incorporating a flood warning system based on sound modelling of reliable data, a catchment wide planning strategy and strategies to increase technical and institutional capacity	Nadi Basin Flood Management Plan	Endorsement of NBCC on the Nadi Basin Flood Management Plan	Risks to various individual components do not compromise the value of the information; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation	NBCC (LWRM, NDMO, FMS, WAF, Nadi Town Council, Nadi Chamber of Commerce)

	<b>Indicative Activities</b>				
1.3.1	Synergise technical, community and economic studies	Inclusion of integrated sector studies in Draft NBFMP	NBCC endorsement of Draft NBFMP for consultation	Recruitment/retention of suitably skilled personnel; risks to various individual components do not compromise the value of the information	PMU/NDMO
1.3.2	Define level of acceptable risk	Clearly defined acceptable level of risk for catchment flood risk management in Draft NBFMP	NBCC endorsement of Draft NBFMP for consultation	Stakeholders are able to reach agreed acceptable level of risk; There is sufficient confidence in the available data to define various levels of risk and vulnerability	NBCC (LWRM, NDMO, FMS, WAF, Nadi Town Council, Nadi Chamber of Commerce)
1.3.3	Develop Draft Basin Flood Mgmt Plan (including vision, acceptable risk, strategy etc, building on previous IWRM goals identified)	Draft Basin Flood Management Plan for consultation	NBCC endorsement of Draft NBFMP for consultation	Recruitment/retention of suitably skilled personnel; risks to various individual components do not compromise the value of the information	
1.3.4	Open Contents through NBCC to wider stakeholder consultation	Wide area consultation on the Draft Basin Flood Management Plan	Wide area consultation report that collates input and comments into the Draft Basin Flood Management Plan	Risks to various individual components do not compromise the value of the information; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation	
1.3.5	Develop Nadi Basin Flood Management Plan - An integrated flood risk management plan developed through community engagement, incorporating a flood warning system based on sound modelling of reliable data, a catchment wide planning strategy and strategies to increase technical and institutional capacity	Nadi Basin Flood Management Plan developed through proper consultation and community engagement	NBCC endorsement of NBFMP	Risks to various individual components do not compromise the value of the information; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation	PMU
	<b>Output</b>				
1.4	Replication Strategy - A strategic document identifying flood risk preparedness needs at a national level, identifying mechanisms for transferring learnings and tools and key policy and financial enabling factors, revised to identify lessons and tools as they become available	Replication Strategy updated on an annual basis to incorporate learnings and tools	Interim National Water Committee endorsement	Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation	LWRM, NBCC
	<b>Indicative Activities</b>				
1.4.1	Develop Replication Strategy aligned with recommended institutional changes for replicating the project learnings and outcomes nationally and regionally	A strategic document identifying flood risk preparedness needs at a national level, identifying mechanisms for transferring learnings and tools and key policy and financial enabling factors	Interim National Water Committee or NBCC endorsement	Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation	NDMO
1.4.2	Implement Replication strategy	Replication Strategy updated on an annual basis to incorporate learnings and tools	NBCC endorsement	Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy; lack of development of enabling policy and legislation	NDMO
	<b>COMPONENT 2</b>				
<b>2</b>	<b>Sound governance to provide confidence in the transparency, accountability and credibility of decisions</b>	Establishment of a Nadi Basin Catchment Committee with public accountability	Minister endorsement of NBCC	Political commitment and lack of enabling environment	
	<b>Output</b>				
2.1	Establish and support the Nadi Basin Catchment Committee, incorporating cross-sector, government, civil organisational, private sector and community representatives responsible for delivering the integrated flood risk management plan, with public accountability	Establishment of a Catchment Management Committee	Minister endorsement of NBCC	Political commitment to proposed governance structures; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy	
	<b>Indicative Activities</b>				
2.1.1	Develop governance framework for NBCC, including Terms of Reference, roles and responsibilities and legislative and institutional links	Terms of Reference Roles and Responsibilities identified, including Agency roles and responsibilities	NBCC endorsement	Political commitment to proposed governance structures; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy	PMU, LWRM

2.1.2	Identify options for sustainable financing (and institutional home) of Nadi BCC, GIS Mgmt Plan, and other Project Outputs	To be determined - possibly through a study report Funding proposal for co-funding to meet other Project Output	Endorsement at relevant level	Political commitment to sustainable funding options. Potential politics of Agencies	
2.1.3	Develop support structure for NBCC, including an executive capacity	Executive support appointed and finance in place	Permanent Secretary endorsement	Capacity to attract and retain suitable candidates: Government agency politicking	LWRM
2.1.4	Establish NBCC	Appointment of NBCC members	Permanent Secretary endorsement of NBCC	Capacity to attract and retain suitable candidates	LWRM
2.1.5	Raise awareness and develop skills of NBCC	Capacity building for NBCC enhanced understanding on IWRM	NBCC Enhanced understanding on NBCC with full involvement in decision making process for IWRM	NBCC members can be retained	PMU
<b>COMPONENT 3</b>					
3	<b>A stakeholder engagement strategy that raises awareness, increases participation, particularly of marginalised sectors, and builds stakeholder capacity to support a sustainable flood management plan</b>	Stakeholder Engagement Plan with Communication strategy in place	stakeholder engagement analysis and strategy in place	Changes in stakeholder roles, responsibility and focus: unable to obtain agreement on concept of acceptable risk and changes in enabling environment	PMU /NBCC
	<b>Output</b>				
3.1	A Communication Strategy that facilitates increased engagement by identifying mechanisms for communicating issues, outputs and outcomes to key and vulnerable stakeholders	Communication strategy that facilitates increased engagement	Endorsement by NBCC	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment: Capacity to bring stakeholders together in defining acceptable risk	PMU/NBCC
	<b>Indicative Activities</b>				
3.1.1	Develop communication strategy in consultation with key stakeholders to raise awareness and understanding of NBCC issues and uptake of flood risk management strategies	Communication strategy that accounts IWRM and IFRM awareness	NBCC endorsement	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters	PMU/NBCC
3.1.2	Develop and implement strategy to communicate the concept of acceptable risk and cost-benefit tradeoffs associated with flood risk mitigation	Communication strategy In place on flood risk mitigation and its associated risk and cost benefit trade offs	NBCC endorsement	Capacity to bring stakeholders together in defining acceptable risk	PMU/NBCC
3.1.3	Implement communication strategy	Commitment and Involvement of stakeholders in the communication and awareness programme for IWRM	Clearly defined communication strategy and each stakeholders involved endorsed by NBCC	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters (particularly major flooding in the Nadi catchment - which might increase support but delay activities)	
	<b>Output</b>				
3.2	Participation Strategy	Commitment and Involvement of stakeholders identified in the participation strategy with clearly defined role and involvement.	Participation strategy endorsed by NBCC	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters (particularly major flooding in the Nadi catchment - which might increase support but delay activities): Capacity to retain upskilled personnel	

	<b>Indicative Activities</b>				
3.2.1	Develop strategy to increase stakeholder engagement in NBC activities, including strategies to engage and empower marginalised stakeholders	Clearly defined stakeholders engagement plan with capacity building component	Stakeholder engagement analysis and strategy in place	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters (particularly major flooding in the Nadi catchment - which might increase support but delay activities); Capacity to retain upskilled personnel	
	<b>Output</b>				
3.3.	Capacity Building	Stakeholder capacity is developed to a level that enables sustainable flood risk management and participation from all sectors across government, non-government organisations and the community	Capacity building at all level of capacity from individual (through awareness), at institutional level (with a defined stakeholder engagement) and at systemic level (through flood risk development plan develop into policy)	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters (particularly major flooding in the Nadi catchment - which might increase support but delay activities); Capacity to retain upskilled personnel	
	<b>Indicative Activities</b>				
3.3.1	Undertake capacity needs assessment for stakeholders, governance, technical and institutional needs	Completion of technical, governance, institutional, community and managerial capacity needs assessment, identifying long-term needs and priority areas for capacity building	Capacity Assessment Report with defined capacity areas to be addressed and prioritisation of capacity areas	Assume that assessment is able to be representative of broad stakeholder interests: changing political and stakeholder focus may date the strategy rapidly	
3.3.2	Develop capacity building strategy, incorporating awareness, partnerships and education, linked to engagement and communication strategies	Capacity building strategy, identifying strategies to address priority and long-term capacity needs, as well as strategies to maintain and build on existing capacity	Capacity gaps and needs identified for education awareness program with communities and stakeholders	Assume that assessment is able to be representative of broad stakeholder interests: changing political and stakeholder focus may date the assessment rapidly	
3.3.3	Develop capacity building toolkit	Develop tools identified in capacity building strategy, with a focus on priority needs	Development of Capacity building Toolkit	Capacity building tools prepared in absence of initial assessment on the existing capacity and the priority needs. Capacity Tool cannot be tailored to suit each community	
3.3.4	Implement capacity building strategy through awareness raising campaigns, targeted workshops, partnerships, broad consultation, recruitment, education and use of toolkits	Annual reporting identifying reduced needs for lower capacity development and increasingly complex capacity development needs	Awareness raising campaigns, targeted workshops, recruitment and development of toolkits envelopes around addressing capacity gaps and building capacity.	Changes in stakeholder roles, responsibilities and focus: Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters (particularly major flooding in the Nadi catchment - which might increase support but delay activities); Capacity to retain upskilled personnel	
3.3.5	Develop pilot schemes, including using local farms to demonstrate land management practices	Delivery of pilot schemes, linked to toolkits and aligned with priority needs	Testing of Toolkit in pilot schemes	Representative pilot schemes can be established; land access and rights may challenge the project; financial stability and commitment of farmers	
	<b>COMPONENT 4</b>				
4	<b>Flood Risk Management Tools Developed to support the Flood Management Plan</b>	Development of priority tools	Capacity Assessment of Needs and Prioritisation of Needs	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns: Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results: Also at risk of equipment failure, major floods and land access issues	
	<b>Output</b>				
4.1	Upgrade hydro-climate monitoring network	Basin wide hydro-climate monitoring network established	Basin wide hydro-climate monitoring network	Capacity to fund equipment and retain skilled staff	WAF, FMS, NDMO, LWRM (Technical Sub-committee), PMU
	<b>Indicative Activities</b>				
4.1.1	Assess & identify equipment needs	Technical assessment identifying priority areas for upgrading	Technical assessment report	Adequate equipment can be identified within project budget	WAF, FMS, NDMO, LWRM (Technical Sub-committee), PMU
4.1.2	Source and purchase equipment	Delivery of equipment aligned with priority needs	Delivery of equipment aligned with priority needs	Financial stability; exchange rates; supplier stock	WAF, FMS, NDMO, LWRM (Technical Sub-committee), PMU
4.1.3	Install equipment	Equipment commissioned and operational	Equipment commissioned and operational		
	<b>Output</b>				

4.1	Climate Change Adaptation Project	Improved technical capacity to formulate and implement national and sub-national policies, legislation, and costing/assessment exercises. Climate change risks incorporated into relevant governance policies and strategies for achieving food security, water management, and coastal development.	pilot demonstration activities that deliver adaptation benefits	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available	Co-funding (PACC Program)
	<b>Indicative Activities</b>				
4.1.1	Replication of Best Practice from PACC	Study report -replicated in this catchment	Best Practice Guide		PACC Co-ordinator / LWRM
4.1.2	<b>Output</b>				
4.2	Operational rainfall event forecasting	Rainfall event forecasting system established	Establishment of forecasting system	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results; potential for consultation process to impact on project if done poorly	WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
	<b>Indicative Activities</b>				WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.2.1	Collect and collate rainfall and weather data	Rainfall and weather data sets established	Data base established		WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.2.2	Analyse data, including a gap analysis	Data analysis and gaps identified	Report on data status		WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.2.3	Develop rainfall predictive model	Functioning rainfall model	Functioning rainfall model		WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.2.4	Document processes and train users	Operational manual developed and	Operational manual		WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.2.5	Maintain the system	Budget allocation and maintenance reporting systems developed	Systems operational and maintenance manual		WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
	<b>Output</b>				WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.3	Rainfall – runoff prediction model	Functioning rainfall-runoff model developed that provides satisfactory level of confidence for modelling	Functioning rainfall-runoff model	Assumption that adequate data can be sourced to be useful within the project cycle; ongoing funds maintained	WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
	<b>Indicative Activities</b>				WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.3.1	Source and collate data	Water level records and data sets established	Data base established	Assumption that adequate data can be sourced to be useful within the project cycle	WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.3.2	Develop rainfall-runoff predictive model	Rainfall - runoff model developed that satisfactorily generates streamflow hydrographs	Functioning rainfall model	Assumed that sufficient data available for modelling to be meaningful; able to retain skills/capacity	WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.3.3	Document processes and train users	Operational manual developed	Operational manual		WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.3.4	Interface with rainfall predictive model	Interface system developed and tested for iterative runoff and stream flow routing	Functioning rainfall model	Risk that the interface with rainfall model provides false confidence in prediction	WAF,FMS,NDMO,LWRM (Technical Sub-committee),PMU
4.3.5	Maintain the system	Budget allocation and maintenance reporting systems developed	Budget secured, Reporting Mechanism in place	Ongoing funds not maintained; capacity to retain skilled personnel	PMU
	<b>Output</b>				
4.4	Best-practice cultivation guide	Development of best practices guidelines that optimises resource utilisation and conservation	Best Practice Guidelines for Resource Management of the Nadi basin	Non availability of data and information on past and present resource inventory	
	<b>Indicative Activities</b>				LRPD Forestry Dept. (Land & Water Use Sub-committee)

4.4.1	Review rainfall - runoff model Outputs	Report on model outputs	Report Documented		LRPD, Forestry Dept. (Land & Water Use Subcommittee)
4.4.2	Review land management practices	Report on land management practices	Establishment of Land Management Practices		LRPD, Forestry Dept. (Land & Water Use Subcommittee)
4.4.3	Develop best practice guidelines				PMU
4.4.4	Develop communication strategy	Communication strategy	Communication Strategy in place		
	<b>Output</b>				
4.5	Riparian and floodplain vegetation mapping	Riparian and flood plain maps developed	Resource maps	Capacity to resource mapping, develop and maintain database and retain personnel	NLTB, LRPD, Forestry Dept. (Land & Water Use Subcommittee)
	<b>Indicative Activities</b>				
4.5.1	Survey infrastructure, ecology and channel geometry	Report on infrastructure and ecology, maps of channel geometry	Reports and maps	Capacity to develop and manage appropriate database; potential for mis-interpretation of data	NLTB, LRPD, Forestry Dept. (Land & Water Use Subcommittee)
4.5.2	Develop riparian zone GIS mapping	GIS maps of riparian zones	GIS maps of riparian zones	Capacity to retain personnel	
	<b>Output</b>				
4.6	Flood warning system	Flood warning system developed based on reliable data and community engagement	NBCC endorsement	Major floods changing risk profile; Community acceptance of risk changes; political or financial change or instability; ageing infrastructure; changes in political direction or government restructure	NDMO, FMS, WAF, LWRM
	<b>Indicative Activities</b>				
4.6.1	Assess socio-economic benefits of flood warning system, linked to defined acceptable risk	Socio-economic assessment report	NBCC endorsement	Obtainable data adequate to provide confidence in recommendations; inability of community to reach agreed acceptable risk	Uni of Fiji
4.6.2	Develop Communication and awareness strategy with communities, including determination of best flood warning approach for the Nadi Basin based on options from socio-economic assessment	Communication and awareness strategy that identifies mechanism for communicating outputs and outcomes for flood warning system development	NBCC endorsement	Community acceptance of risk changes; changes in stakeholders or stakeholder focus	NDMO, PMU
4.6.3	Develop flood preparedness and response plans	Flood preparedness and response plans developed for consultation	NDMO endorsement	Major floods changing risk profile; Community acceptance of risk changes; political or financial change or instability	NDMO, PMU
4.6.4	Determine most appropriate institutional setting		NBCC endorsement	Change in policy direction; Government restructure	
4.6.5	Construct warning system (depending on methods construction may include tele-communications, siren warnings, etc)	An effective flood warning system in operation	NBCC endorsement	Aging equipment reduced operating efficiency; Adverse weather; Mechanical breakdown; Industrial disputes; Land negotiations; Waiver of fishing rights; Outsourcing capacity	WAF, FMS, NDMO, LWRM (Technical Subcommittee), PMU
	<b>Output</b>				
4.7	Floodplain inundation modelling	Inundation model developed that provides satisfactory level of confidence for flood risk assessment	NBCC endorsement	Data and capacity limitations; uncertain costs	WAF, FMS, NDMO, LWRM (Technical Subcommittee), PMU
	<b>Indicative Activities</b>				
4.7.1	Assess most cost-effective means of undertaking floodplain inundation modelling (LIDAR / DEM / SAR)	Remote sensing methodology identified	NBCC endorsement	Required level of detail not attainable within project budget	WAF, FMS, NDMO, LWRM (Technical Subcommittee), PMU
4.7.2	Model floodplain inundation for targeted events	Modelling of flow events for adopted flood standard, flood hazard mapping, velocity, discharge and level profile	Inundation model reports	Uncertainty associated with low-frequency events likely to be high and significantly modified if large event during study. May not be sufficient data to develop meaningful model with project cycle	WAF, FMS, NDMO, LWRM (Technical Subcommittee), PMU
4.7.3	Develop model scenarios to support planning and management decisions	Portfolio of measures linked to defined acceptable risk	NBCC endorsement	Uncertainty associated with low-frequency events likely to be high and significantly modified if large event during study. May not be sufficient data to develop meaningful model with project cycle	PMU
4.7.4	Document processes and train users	Process Documented	Lesson Learnt for replication	May not be able to identify candidates at sufficient baseline of skills	PMU

	<b>Output</b>				
4.8	Riparian management guidelines	Riparian zones guidelines that contribute to improve physical and water quality	Riparian Zone Guidelines with NBCC endorsement	Limited information available to provide confidence in untried strategies; potential land access/ownership challenges in developing pilot sites; exposure to natural disasters; capacity to source skills and potential for changed stakeholder focus	NLTB, LRPD, Forestry Dept. (Land & Water Use Sub-committee)
	<b>Indicative Activities</b>				
4.8.1	Undertake desktop study of flow and pollution mitigation strategies	Study report	Technical report	Limited information that is applicable to Nadi catchment, reducing confidence in conclusions	IUCN
4.8.2	Undertake pilot studies to investigate appropriateness of mitigation strategies in NBC	Study report	Technical report	Cyclones/flooding or unusual weather limiting representativeness of results; land access and rights; capacity to identify representative sites	IUCN
4.8.3	Develop riparian management guidelines	Draft guidelines for consultation	NBCC endorsement	Capacity to attract/retain appropriately skilled personnel	IUCN
4.8.4	Develop and implement awareness and education strategy	Communication and awareness strategy that identifies mechanism for communicating outputs and outcomes	NBCC endorsement	Changes to stakeholder makeup and focus diminish effectiveness	
	<b>Output</b>				
4.9	Develop Sustainable Landuse Strategy of Nadi Basin	Sustainable Landuse Strategy of Nadi Basin	Endorsement of Sustainable Landuse Strategy of the Nadi Basin	Non committal of Stakeholders to the Development of a Sustainable Landuse Strategy of Nadi Basin	LRPD, Forestry Dept. (Land & Water Use Sub-committee)
	<b>Indicative Activities</b>				
4.9.1	Conduct Community Consultation for SLM / SFM awareness and explore opportunities for demo site	Through Community consultation, possible demo plot for SLM and SFM is identified	Community Consultation and Awareness	Land ownership / Conflict	LRPD, Forestry Dept. (Land & Water Use Sub-committee)
4.9.2	In partnership arrangement with Landuse Division initiate demo plots for SLM	SLM Initiated	SLM Project Implementation	Lack of Capacity with Landuse Division for funds, technical expertise (extension officers for monitoring)	LRPD, Forestry Dept. (Land & Water Use Sub-committee)
4.9.3	In partnership arrangement with Forestry Dept initiate demo plots for SFM	SFM Initiated	SFM Project Implementation	Lack of Capacity with Forestry Department for funds, technical expertise (extension officers for monitoring)	LRPD, Forestry Dept. (Land & Water Use Sub-committee)
	Secure Funding Support for SLM / SFM Implementation	Funding Support secured for SFM / SLM	Funding Proposal	Obstacle with Securing of Fund	PMU, Land & Water Use Sub-committee
<b>COMPONENT 5</b>					
5	<b>Complete targeted scientific and technical studies to inform flood management planning</b>	A high level of flood risk awareness developed to a level that enables stakeholder and community participation in the development of integrated flood risk management plan.	Integrated flood risk management plan	Reliant on co-funded activities, with associated funding, commitment, integration, resources and timing concerns; Assumed that sufficient information is obtainable to provide confidence in results, adequate resources available, adequately skilled people can be attracted and retained and that complex systems can be simplified to provide meaningful results	
	<b>Output</b>				
5.1	Assess the effectiveness of sediment and flow mitigation strategies including flood detention dams	Assessment of sediment and flow	Integrated flood risk management plan	Assumed that sufficient confidence in assessment, and funding and resources available	IUCN
	<b>Indicative Activities</b>				
5.1.1	Assess performance of existing infrastructure and current strategy	Study report	Integrated flood risk management plan	Inadequate information available or able to be collected within the project cycle to provide confidence in assessment	IUCN
5.1.2	Develop flood risk mitigation infrastructure strategy (including possible need for retro-fitting)	Infrastructure flood risk mitigation strategy	Integrated flood risk management plan	Inadequate information available or able to be collected within the project cycle to provide confidence in recommendations	PMU, LWRM
5.1.3	Develop asset management plan(s) incorporating study findings	Asset management plans identifying priority areas	Integrated flood risk management plan	Inadequate funding available to support meaningful asset management plans. Capacity to attract/retain adequately skilled personnel	

5.2	<b>Output</b> Sediment flux assessment	A catchment based assessment that identifies key areas for sediment control and mechanism for communicating outputs and outcomes	Study report	External agency responsible for delivery: changes to funding, commitment, integration with project, resources, timing or focus. Assumption that adequate data is available or can be collected within a practical timeframe to enable useful interpretations to be made and that it is possible to simplify environmental processes to enable meaningful interpretations	IUCN
	<b>Indicative Activities</b>				
5.2.1	Survey current sediment fluxes and map source areas	Study report	Study report		IUCN
5.2.2	Assess potential mitigation strategies, considering sedimentation rates, dredging frequency requirements, level of acceptable risk and costs	Study report	Study report		USP
5.3	<b>Output</b> Water quality and biological surveillance	A water quality and biological assessment that establishes river water health qualities and mechanism for communicating outputs and outcomes	NBCC endorsement	External agency responsible for delivery: changes to funding, commitment, integration with project, resources, timing or focus. Assumption that adequate data is available or can be collected within a practical timeframe to enable useful interpretations to be made and that it is possible to simplify environmental processes to enable meaningful interpretations. Failure of the agency to develop the database means that the project will require a separate task to include data management. Poor stakeholder engagement has the potential to compromise other aspects of the project	IUCN IUCN
	<b>Indicative Activities</b>				
5.3.1	Design water quality and biological monitoring and evaluation programme to inform guideline development	Quality and monitoring program	Quality and monitoring program		
5.3.2	Implement water quality and biological monitoring and evaluation program	Budget allocation	Budget allocation		Live & Learn
5.3.3	Develop data management and reporting system	Data base and Reporting system	Data base and Reporting system		
5.3.4	Develop strategy for stakeholder monitoring capacity building and handover of M&E program components	Stakeholder capacity building strategy, identifying strategies to address M&E	NBCC endorsement		
	<b>Output</b>				PMU /NBCC
5.4	<b>Output</b> Mangrove mapping and ecological assessment	Map that establishes current distribution of mangroves, coastal landscape and ecological services	Mangrove and ecological map	External agency responsible for delivery: changes to funding, commitment, integration with project, resources, timing or focus. Assumption that adequate data is available or can be collected within a practical timeframe to enable useful interpretations to be made and that it is possible to simplify environmental processes to enable meaningful interpretations	IUCN IUCN
	<b>Indicative Activities</b>				
5.4.1	Survey mangrove communities	Survey report	Survey report		IUCN
5.4.2	Undertake scientific and socio-economic study to assess the value of mangrove communities	Study report	Study report		IUCN
5.4.3	Develop strategy to incorporate the value of mangroves into flood risk management	Study report	Study report		IUCN
5.5	<b>Output</b> Water quality variability assessment	A water quality and variability assessment that establishes parameters for river water health and mechanism for communicating outputs and outcomes	NBCC endorsement	External agency responsible for delivery: changes to funding, commitment, integration with project, resources, timing or focus. Assumption that adequate data is available or can be collected within a practical timeframe to enable useful interpretations to be made and that it is possible to simplify environmental processes to enable meaningful interpretations	IUCN
	<b>Indicative Activities</b>				
5.5.1	Collect and collate water quality data for the Nadi coastal waters and Nadi River discharges	Water quality monitoring program	Water quality Data sets		
5.5.2	Assess the temporal and spatial variability of water quality in the coastal waters and discharging river water, particularly that associated with flooding	Study report	Study report		
5.5.3	Investigate the fate of pollutants discharged from the Nadi River in coastal waters	Study report	Study report		IUCN
5.5.4	Assess impacts of the range of flood discharges on receiving coastal environment to inform flood planning decisions	Study report	Study report		IUCN



	<b>Output</b>				
5.6	Coastal water quality and biological surveillance	A coastal water quality and biological assessment that identifies coastal water health status and mechanism for communicating outputs and outcomes	NBCC endorsement	External agency responsible for delivery: changes to funding, commitment, integration with project, resources, timing or focus. Assumption is that the changes or influence can be adequately defined to be useful	IUCN
	<b>Indicative Activities</b>				
5.6.1	Establish long-term monitoring program to assess the impacts of flood flow mitigation within the catchment	Monitoring program supported with identifiable parameters for impact assessment	Monitoring program		
	<b>Output</b>				
5.7	Assessment of impacts of flood mitigation strategies on groundwater resources	Study report	Study report	External agency responsible for delivery: changes to funding, commitment, integration with project, resources, timing or focus. Assumption is that the influence can be adequately defined to be useful	MRD, WAF
	<b>Indicative Activities</b>				MRD, WAF
5.7.1	Investigate the influence of flood events and changing river regimes on groundwater recharge and water quality	Study report	Study report		MRD, WAF
5.7.2	Review risk mitigation strategy impacts on groundwater to inform NBCC decision-making	Study report	Study report		MRD
<b>COMPONENT 6</b>					
6	<b>To Successfully commence implementation of the Nadi River Flood Management Plan</b>	A high level of flood risk preparedness, reflected through an integrated flood risk management plan, developed through community engagement, incorporating a flood warning system based on sound modelling of reliable data, an enabling policy and financial framework, a catchment wide planning strategy and increased technical and institutional capacity	Adoption of the activities outlined in the Nadi River Flood Management Plan	Significant changes in enabling environment which may include limited political and financial stability, Limited constitation for a major development down stream with negative impacts	
	<b>Output</b>				
6.1	Executive and secretariat support for NBCC	Promulgation of legislation supporting basin wide catchment committees	Legislation promulgated	Lack of political will to support sustainable funding mechanism and/or capacity to attract/retain appropriate candidates	MPI/LWRM
	<b>Indicative Activities</b>				
6.1.1	Identify NBCC support requirements, roles and responsibilities and funding mechanisms	Terms of reference and guidelines on roles and responsibilities with funding mechanisms	TOR Developed with clear funding mechanism	Lack of political will to support sustainable funding mechanisms	MPI/LWRM
6.1.2	Establish executive support unit	Executive support unit established	Establishment of Executive Support Unit	Capacity to attract/retain appropriate candidates	MPI/LWRM, PMU
	<b>Output</b>				
6.2	Plan Implementation	Adoption of the major strategies outlined in the Nadi River Flood Management Plan by vulnerable communities		Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters (particularly major flooding in the Nadi catchment - which might increase support but delay activities)	
	<b>Indicative Activities</b>				
6.2.1	Executive support unit to implement NBC Flood Management Plan under NBCC governance, including reporting and auditing			Capacity to attract/retain appropriate candidates. Political will to implement strategy, including providing government sourced funding	

