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For sustainable development

Council Study

Work Plan: Formulation of Development Scenarios for the Navigation Thematic Area

5th RTWG Meeting
Siem Reap, Cambodia
13-14 August 2015

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Introduction

Scen #	Name	Level of Development*					
		ALU	DIW	FPF	HPP	IRR	NAV
1	Early Development Scenario 2007	2007	2007	2007	2007	2007	2007
2	Definite Future Scenario 2020	2020	2020	2020	2020	2020	2020
3	Planned Development Scenario 2040	2040	2040	2040	2040	2040	2040

Note:
*Levels of developments for the various thematic areas: ALU = Agric/Landuse Change; DIW = Domestic and Industrial Water Use; FPF = flood protection/floodplain infrastructure; HPP = hydropower; IRR = irrigation; and NAV = Navigation

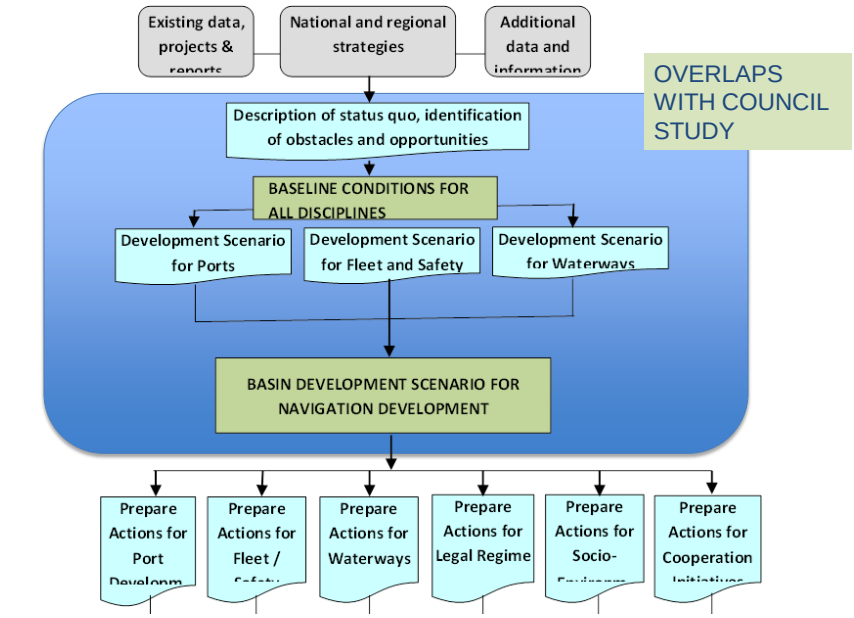
Liaison Master Plan for Regional Waterborne Transport and the Council Study

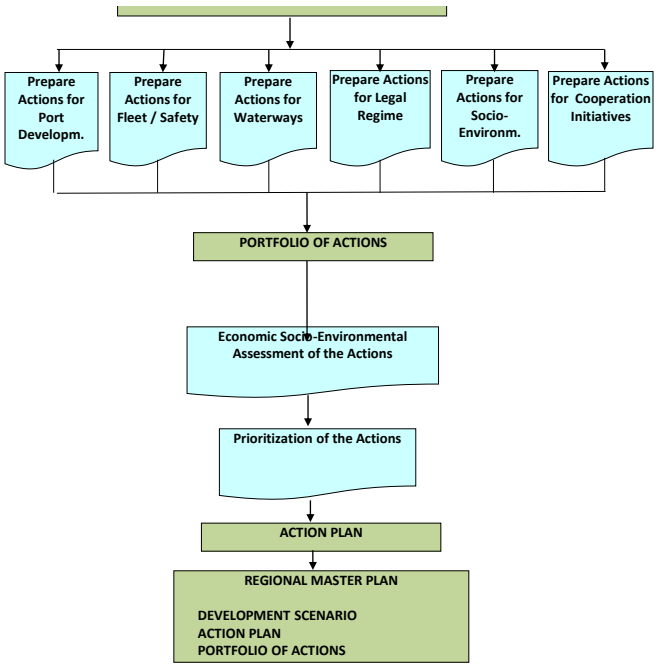
NAP is currently designing the Master Plan (MP) for Regional Waterborne Transportation along the Mekong River.

This design process has usable overlaps with the CS, related to the Development Scenarios.

The MP has changed its Development Scenarios timeline to be in line with the CS

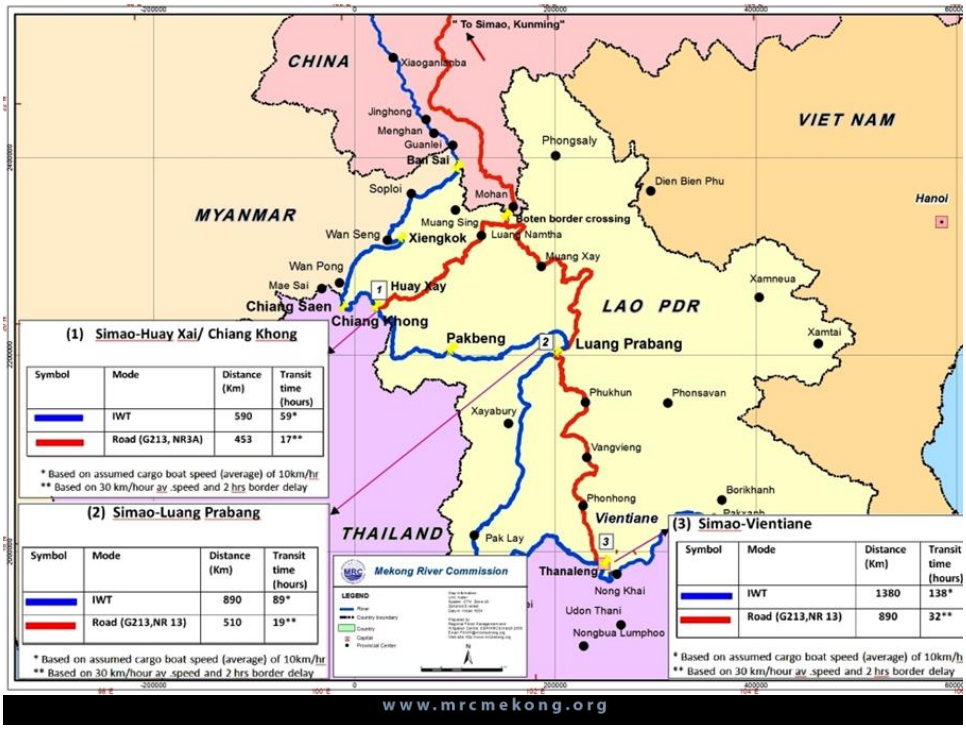
FLOW CHART FOR THE DESIGN ON THE MASTER PLAN





Economic Assessment Report and Preliminary Development Scenarios for Navigation

- Contains regional transport demand forecasts on Rivers, Roads, Railways.
- 3 transport corridors for each Upper and Lower Mekong Basin
- Basis for formulation of development scenarios



Preliminary Forecast results

(1) Upper Mekong:

IWT cross border cargo traffic, Northern Lao PDR-China and Thailand

Ref. year	Forecast 1 (status quo IWT 100 DWT)			Forecast 2 (investment case IWT 500 DWT)		
	Cargo volumes ('000 tonnes)			Cargo volumes ('000 tonnes)		
	Road	IWT	Total	Road	IWT	Total
2014 (Base Year)	302	216	518	302	216	518
2015	392	214	606	392	214	606
2020	802	207	1,009	713	296	1,009
2025	1,153	202	1,355	897	458	1,355
2030	1,617	202	1,819	1,078	741	1,819
2035	2,156	202	2,358	1,198	1,160	2,358
2040	2,802	202	3,004	1,245	1,759	3,004
AARG						
2014-2020	17.7%	-0.7%	11.7%	15.4%	5.4%	11.7%
2014-2040	8.9%	-0.3%	7.0%	5.6%	8.4%	7.0%
Mode share						
2014	58.4%	41.6%	100.0%	58.4%	41.6%	100.0%
2020	79.5%	20.5%	100.0%	70.7%	29.3%	100.0%
2040	93.3%	6.7%	100.0%	41.5%	58.5%	100.0%

Preliminary Forecast results

(2) Lower Mekong:

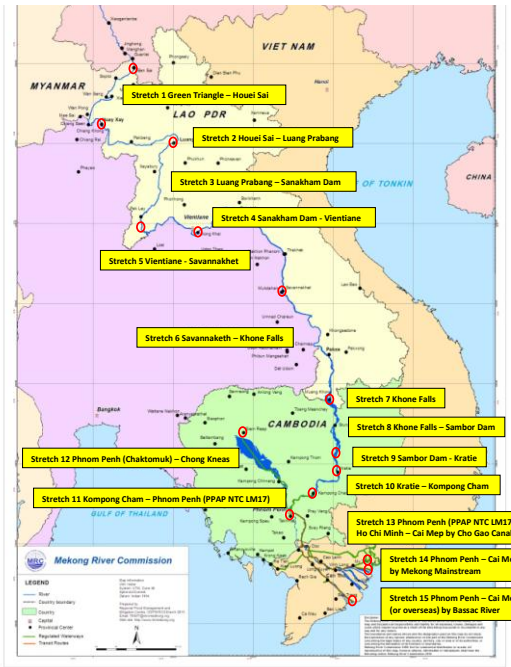
Forecast 1 (Higher growth based on regression against GDP)

Ref. year	Containers		Petroleum	Gen. cargo	Agric.ex Kpg Cham	Total cargo
	'000 TEU	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes
2014 (Base year)	133.7	1025	605	267		1898
2015	128.6	986	966	286	36	2274
2020	164.1	1259	1657	410	62	3388
2025	256.6	1968	2745	575	114	5402
2030	375.8	2882	4054	788	150	7875
2035	525.1	4028	5816	1055	188	11087
2040	688.3	5279	7869	1346	225	14720
AARG						
2015-2020	5.0%	5.0%	11.4%	7.4%	11.6%	8.3%
2015-2040	6.9%	6.9%	8.8%	6.4%	7.6%	7.8%

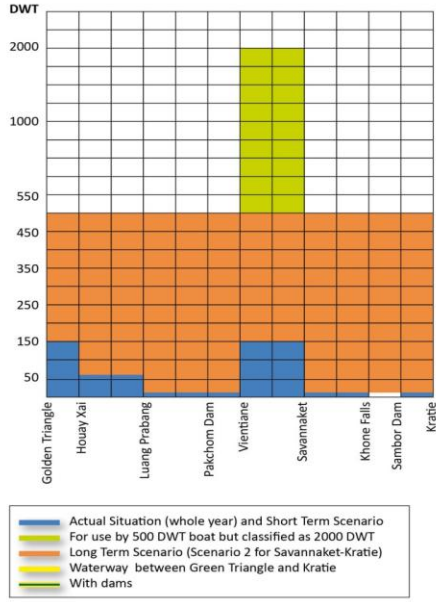
Forecast 2 (Lower growth based on application of GDP growth)

Ref. year	Containers		Petroleum	Gen. cargo	Agric.ex Kpg Cham	Total cargo
	'000 TEU	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes	'000 tonnes
2014 (Base year)	133.7	1025	605	267	0	1898
2015	136.3	1045	966	286	36	2333
2020	143.8	1103	1657	410	62	3233
2025	201.7	1547	2521	575	114	4757
2030	276.4	2120	3723	788	150	6781
2035	369.9	2837	5342	1055	188	9421
2040	472.1	3621	7226	1346	225	12419

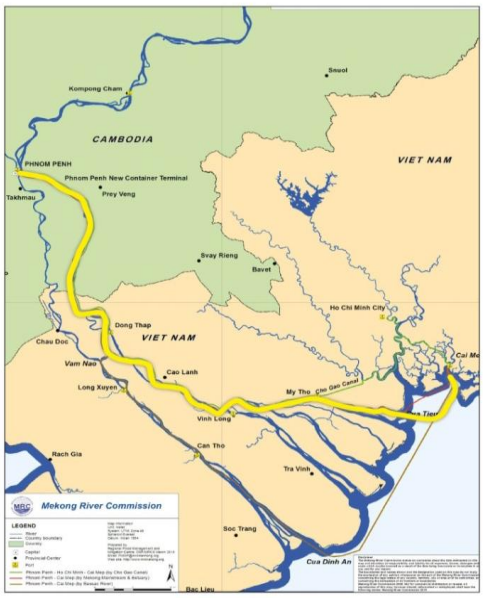
Stretches studied under the Master Plan

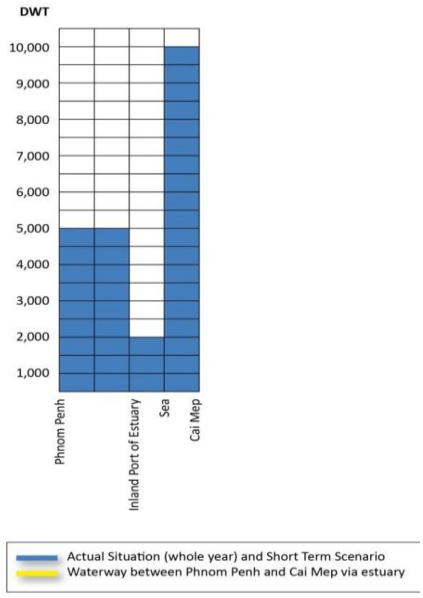


Development Scenario between Green Triangle and Kratie with two cascades of dams
(1) Dams between Pak Beng and Pakchom and (2) Dams between Savannakhet and Kratie



Development Scenario between Phnom Penh and Cai Mep via estuary





Stretch 1 Green Triangle to Houei Sai (293 km)

	CURRENT SITUATION – BASELINE CONDITIONS (2015)	SHORT TERM SCENARIO (2020)	LONG TERM SCENARIO (2040)
FLEET	300 DWT seasonal 150 DWT whole Year No vessel classification. No Government fleet policy.	300 DWT seasonal 150 DWT whole year Standardised vessel classification system that is in harmony with the Chinese vessel classification system. Short Term Government Fleet Policy promoting and facilitating IWT.	500 DWT whole year National or Regional vessel construction and shipyard government policy. Long Term Government Fleet Policy promoting and facilitating IWT.
WATERWAY DESIGN	300 km relatively good navigation between Km marker 244 and Chiang Saen (11 rapids and 10 shoals cleared by the Chinese in a previous project). Downstream Chiang Saen dangerous navigation due to numerous rapids.	Hydrographic survey and channel design in the dangerous areas (Here the Chinese Lancang-Mekong project could be implemented between the Green Triangle (Km marker 244) and Chiang Saen).	The Chinese Lancang-Mekong project will be implemented. Ships of 500 DWT can ply between the Green Triangle (Km marker 244) and Houei Sai all year round!
NAVIGATION SAFETY	Unacceptable conditions for tourists regarding safety and comfort as well on board as ashore. Dangerous goods transport not safe. Regulations for safety of navigation, ships, crew, waterway environment, cargo and passengers: Lao PDR: very limited national regulations; Thailand: limited national regulations (Act on navigation in Thai waters B.E.2456 and regulation on ship survey B.E. 2534). The Lancang-Mekong River Regional Agreement is not adopted in national law, not implemented and no law enforcement.	Increased safety of inland waterway transport, especially regarding safe and comfortable transport of passengers and safe carriage and handling of dangerous goods. Regulations implemented and law enforcement conducted by Department of Waterways in Lao PDR and Marine Department in Thailand. Contingency plan available, with efficient emergency response and search and rescue units installed.	Implemented approved vessel construction standards. Well-designed and constructed safe and environmental friendly inland waterway vessels according fleet demands. Efficient, safe and smooth traffic and cargo flow monitoring and guidance with ENC, AIS and RIS installed.
AIDS TO NAVIGATION	Only daytime navigation (average 13 hrs per day) *. Navigation in this stretch still remains an issue because there are only limited navaids (markers) available. Accidents occur because of this. * Even though the river stretch is only navigable during daylight hours because it is too dangerous at night, many vessels are sailing at night using big floodlights that are installed on the navigation bridge.	Still only daytime navigation but much more efficient and safe because of the introduction of more comprehensive aids to navigation (improved marks and GPS equipment).	Still only daytime navigation but much more efficient and safer because of the introduction of more comprehensive aids to navigation. All commercial boat need the GPS equipment.

PORTS	Houei Sai, Pakbeng and Luang Prabang Ports still in natural condition with unsafe landing facilities for passengers. Limited or no cargo handling facilities	Ports with adequate and well maintained infrastructure for the efficient and safe transfer of passengers. Ports to be compliant with the forecasted passenger throughput. Ports managed with the focus on: ◆ Safety of both port users and port workers ◆ Security ◆ environmental protection and ◆ efficiency.	Ports with adequate and well maintained infrastructure for the efficient and safe handling, storage and transfer of both cargo (including dangerous goods where applicable) and passengers. Ports to be compliant with the forecasted cargo and passenger throughput. Ports managed with the focus on: ◆ Safety of both port users and port workers ◆ Security ◆ environmental protection and ◆ efficiency.

REGULATORY ASPECTS	Freedom of navigation and partial regulatory harmonization under Quadrangle Agreement	Implementation of harmonized rules adopted under the Quadrangle Agreement	Comprehensive, fully harmonized and effectively implemented legal framework
ENVIRONM. ASPECTS	Limited Environmental Management Plan, Waste Management and pollution control.	SIA/EIA for specific port construction and waterway improvement.	Sustainable navigation: Integrated planning, energy efficient vessels, pollution control, Environmental Management Plan and monitoring.
SOCIAL ASPECTS	Rural IWT provides access to national and cross-border ports.	Socio-economic risks and opportunities integrated into SIA.	Inclusive development of cargo and passenger transport.

However, there is a difference between the CS NAV and the NAP MP:

Council study - NAP: Infrastructure impact base

- Development Scenario/Situation (2007): This scenario includes the water infrastructure in the Navigation thematic areas in 2015.
- Definite Future Scenario (2020): This scenario includes all planned construction, and national plans in the Navigation thematic areas which are expected to be in place by 2020.
- Planned Development Scenario (2040): This scenario includes all water resources development that is planned for Navigation in the Mekong Basin and are expected to be in place by 2040 assuming these plans are fully implemented.

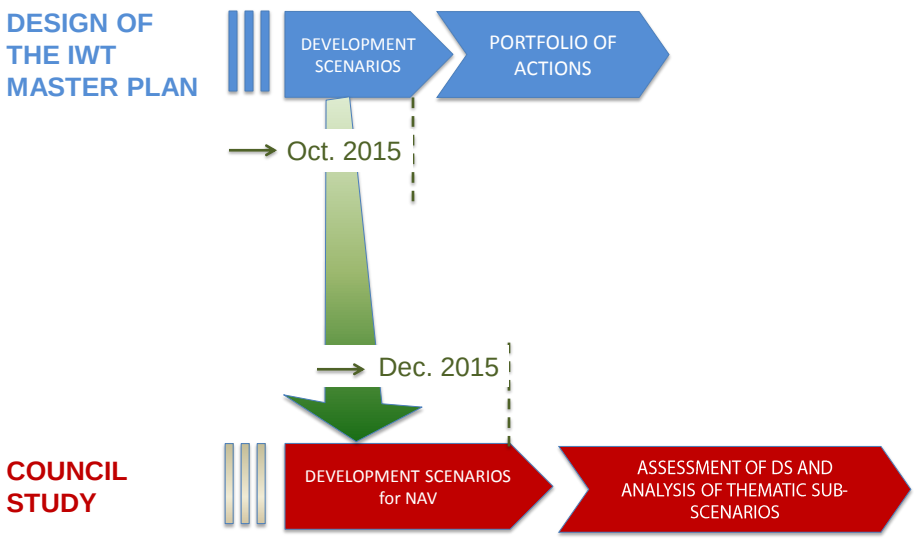
Master Plan: Economic forecast base

- *Economic Data collection*
- *Economic forecast*
- To develop short term (2020) and long term (2040) *development scenarios* for Regional Waterborne Transport in the Mekong River Basin, the River has been subdivided into 15 stretches.
- And *Action Portfolio:* initiatives for regional cooperation, legal and socio-environmental actions, projects and actions have to be identified for fleet, waterway design, port development and navigation safety in order to achieve the proposed short term and long term development scenarios.

Example of Questionnaire on one discipline only:

QUESTIONNAIRE WATERWAY DESIGN AND WORKS ALONG THE RIVER THAT IMPACT NAVIGATION	
Table of content	
1	**ONGOING WORKS, NATIONAL PLANS AND PROJECTS**
1.1	ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR DREDGING
1.2	ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR RIVER REGULATING WORKS (GROYNES – OVERFLOW DIKES …)
1.3	ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR BRIDGES AND POWER LINES
1.4	ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR PIERS EXTENDED" INTO THE NAVIGATION CHANNEL, KNOWN SHIP WRECKS INSIDE THE CHANNEL
2	**ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR HYDROPOWER**
2.1	ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR HYDROPOWER
2.2	ONGOING WORKS, NATIONAL PLANS AND PROJECTS FOR HYDROPOWER SHIP LOCKS
3	**OTHER OBSTRUCTIONS TO NAVIGATION**
4	**MORPHOLOGICAL CHANGES**

Schedule

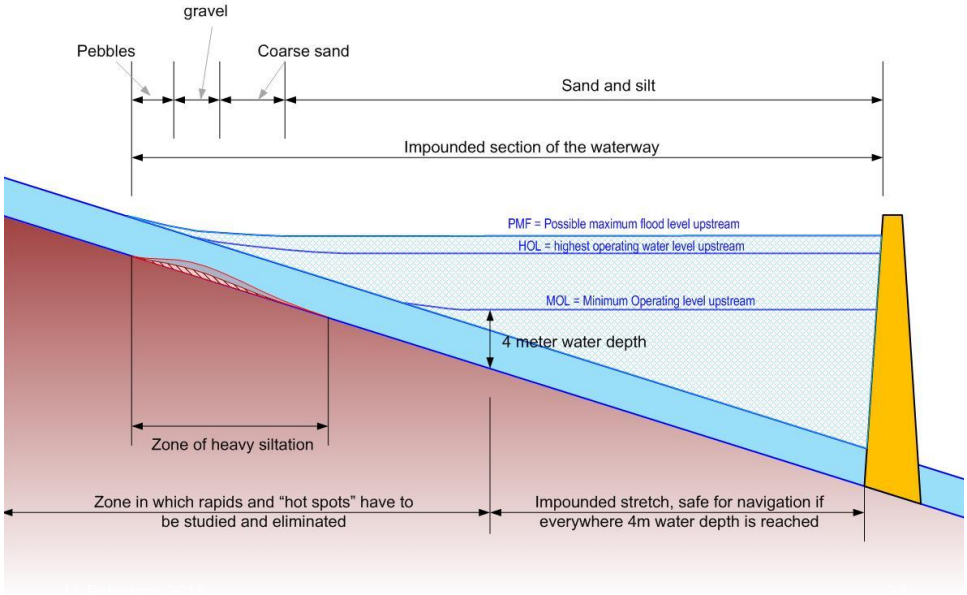

DESIGN OF THE IWT MASTER PLAN
DEVELOPMENT SCENARIOS
PORTFOLIO OF ACTIONS
Oct. 2015
Dec. 2015
COUNCIL STUDY
DEVELOPMENT SCENARIOS for NAV
ASSESSMENT OF DS AND ANALYSIS OF THEMATIC SUB-SCENARIOS

Activity	Dates	Note
Follow-up with line agencies in collecting data. Conducting small group technical consultations with appropriate experts from line agencies **SUBJECT TO AVAILABILITY OF FUNDS**	August to end September 2015	Discuss concept of sub-scenarios and potential sub-scenarios when available Data processing and analysis should be started as soon as data are received SUBJECT TO AVAILABILITY OF FUNDS
Conduct remaining data processing and analysis including identification of remaining data gaps and formulation of thematic sub-scenarios **SUBJECT TO AVAILABILITY OF FUNDS**	August – half November 2015	
Conduct national Consultations (separate meetings with 4 MCs) **SUBJECT TO AVAILABILITY OF FUNDS**	October – November 2015	Present draft formulated scenarios and associated data, and thematic sub-scenarios
Conduct final data collection, data gap filling and analysis and submit Development Scenarios/Sub-scenarios Data/Map Specification **SUBJECT TO AVAILABILITY OF FUNDS**	September-November 2015	Address comments from national consultations

Conclusions

The RTWG is kindly requested to:

- Take note of the progress and understand the limitations of NAV
- The provided amount of USD 50,000 can only be used for national experts, data collection. **An additional amount of USD 170,000** is required for hiring a Waterway Engineer, Transport Economist and Socio-environmentalist, incl. travel and consultations.
- The RTWG is kindly requested to ensure that the National Experts have access to the data and information required for the questionnaires, especially w.r.t. the exact location of future dams incl HOL and MOL (High and Minimum Operating Levels)


gravel
Pebbles
Coarse sand
Sand and silt
Impounded section of the waterway
PMF = Possible maximum flood level upstream
HOL = highest operating water level upstream
MOL = Minimum Operating level upstream
4 meter water depth
Zone of heavy siltation
Zone in which rapids and "hot spots" have to be studied and eliminated
Impounded stretch, safe for navigation if everywhere 4m water depth is reached