

# Launching the Delta Alliance: Content report phase 3

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**Delta Alliance**

[www.delta-alliance.org](http://www.delta-alliance.org)

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# 1 Introduction

## 1.1 Results of the mid-term review

Delta Alliance is an international knowledge-driven network organisation. Its mission is to improve the resilience of deltas through more integrated and effective efforts, building on scientific research and knowledge exchange. It aims at disclosure of knowledge for application by a wide audience of end-users from the knowledge institutions, public partners and private sector, as well as to identification of upcoming research agendas. Delta Alliance implements its resilience strategy by:

- Assessing and monitoring the resilience of deltas to climate change and other pressures (including a regular update of the current and future state of deltas).
- Creating pressure, awareness and momentum for improved resilience through knowledge sharing and capacity building activities.
- Providing knowledge generating activities for improved resilience of deltas to climate change and other impacts.
- Showcasing best practices and lessons learned from across deltas for both preparedness and response derived from examples in the Delta Alliance Wings.
- Hosting Delta Alliance Wing sessions during events or conferences, which include practitioners and experts from deltas around the world.
- Hosting an internet platform with information about deltas, including a Toolbox for Adaptive Delta Management, with methods and tools for delta planning and community based communication for knowledge exchange, capacity building and training.

In 2013 a mid-term review of Delta Alliance's activities took place. As a result of the mid-term review the following issues were agreed upon (for more details see the report of the review meeting).

- The niche for Delta Alliance continues to be to make knowledge on adaptive delta management accessible to practitioners and change agents (public sector, private sector and NGOs). Delta Alliance acts as a knowledge broker between these sectors.
- The activities that Delta Alliance will perform are:
  - Further development and application of the Comparative Assessment method. This will result in an up-to-date overview of the vulnerability of deltas, the networks present in these deltas, knowledge gaps and the potential for interventions and cooperation.
  - Continue to build and maintain the so-called Toolbox for Adaptive Delta Management (Delta Approach) with best practices from all over the world.
  - Organize knowledge exchange events targeted to pressing issues in Wing deltas or other deltas (based on the results of the Comparative Assessment), focusing on sharing lessons learned and best practices (using the Toolbox for Adaptive Delta Management). These knowledge exchange events should be geared towards action, and therefore change agents (such as policy makers, private sector and NGO's) are key-participants in these events.
  - Serve as a knowledge portal for both governments and private parties. These clients can bring their questions to the Delta Alliance International Secretariat, which will bring forward the most suitable team to answer these questions. Delta Alliance will also identify knowledge gaps and brings these gaps to the attention of funding agencies.
- The Dutch Wing will have to be the flywheel for the Delta Alliance and its network and will undertake the following actions:
  - Further development of the Toolbox for Adaptive Delta Management. This Toolbox will demonstrate the high standard of Dutch knowledge and expertise on delta management and further strengthen the international position of the Dutch sector.
  - Become a knowledge portal for the Dutch public and private sector.
  - Include more Dutch knowledge institutions in its activities, so it can act as a broad, representative platform for the Dutch knowledge sector.

- Strengthen cooperation with international organisations, through:
  - Continuation of the development and implementation (in cooperation with the Global Water Partnership) of the Enabling Delta Life Initiative: a global program of action on Deltas.
  - Active participation in international platforms, fora and conferences.

## 1.2 Strategic developments after the mid-term review

After the review mentioned earlier, Delta Alliance focussed on both its regular international activities (further explained in Chapter 5), and on strengthening its position in the Netherlands. A series of meetings was organised with representatives of the Dutch Ministry of Infrastructure and Environment, the Ministry of International Trade and Development Cooperation, the Delta Commissioner, and the Directors of the main knowledge institutes that form the core of the Dutch Wing (Deltares, Alterra, TU Delft and UNESCO-IHE). This has resulted in:

- Strong commitment (at management level) with the mentioned knowledge institutes to contribute to Delta Alliance and to work with Delta Alliance in the pre-competitive phase; broad participation of these institutes in the activities reported here;
- Mutual understanding between Delta Alliance on the one hand and the Ministry of Infrastructure and Environment, the Ministry of International Trade and Development Cooperation and the Delta Commissioner on the other hand on what Delta Alliance should do in order to act as a meaningful knowledge broker. The Delta Commissioner has stated that the Dutch Wing of the Delta Alliance is perfectly equipped to discuss the Dutch Delta Approach in the international arena.
- Following suggestions from Delta Alliance on the Terms of Reference drafted by the ministries, agreement was reached on multi-year funding of Delta Alliance, and on concrete tasks to be performed in the period September 2014 – December 2015.

The proposed /agreed tasks are as follows (see Figure 1):

- *Informing and Brokerage:* Delta Alliance will be a knowledge provider for all international parties that wish to work on delta adaptation together with Dutch partners (government, private or knowledge). To this end Delta Alliance will, among others, assist incoming missions, provide presentations in the countries with which the Netherlands intends to cooperate, organise regular network meetings in the Netherlands, and will act as a knowledge service provider for the Dutch partners (knowledge institutes, governments and private parties), laying special emphasis on the Dutch Delta Approach.
- *Compiling information:* In order to be able to perform the above mentioned activities, Delta Alliance will assemble and make available existing knowledge (tools, methods, approaches) on adaptive delta management, in such a way that it is up to date, easily accessible and directly usable. This will be done through the development and maintenance of the Comparative Assessment and the Toolbox for adaptive delta management.
- *Network:* Further development and maintenance of the Delta Alliance network, instrumental for gathering world-wide information on adaptive delta management and as a means for effective sharing of knowledge and experience and building new partnerships.

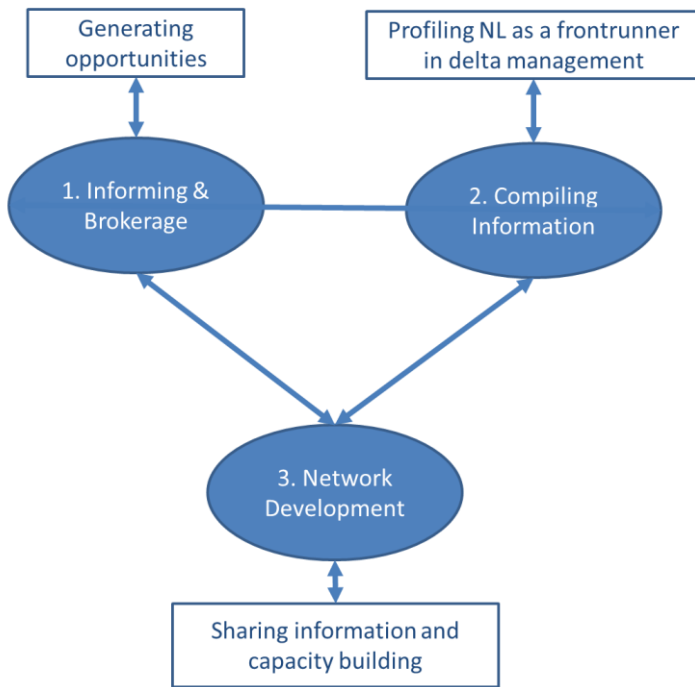


Figure 1: The Delta Alliance knowledge exchange system

These tasks are described in more detail in the proposal for a multi-year program that was submitted to the Interdepartmental Steering Group.

### 1.3 Main activities carried out after the mid-term review

In order to be able to fulfil the agreed task as an international knowledge portal Delta Alliance needs to focus on two tasks. Firstly, it has to have an up-to-date overview of the issues at stake in the most strategic deltas around the world. To this end it was decided that further extension of the earlier developed Comparative Assessment will be a continuous and on-going activity of Delta Alliance in the years to come. In the context of phase 3 a start was made with this, by adding 4 new deltas to the already analysed set of 10 deltas.

Secondly, Delta Alliance needs to have an up-to-date overview of successful tools, methods and approaches for adaptive delta management. This is a new activity for Delta Alliance and in the framework of phase 3 a start was made with the Toolbox for Adaptive Delta Management, to bring together tools, methods, and successful experiences with adaptive delta management in accessible manner for the benefit of end users.

Together with the international Wings Delta Alliance is very well equipped to work on both the Comparative Assessment and the Toolbox for Adaptive Delta Management. With these two information sources in place Delta Alliance can play its role as knowledge broker for the global deltas.

In addition a targeted knowledge brokerage activity was carried out in the San Francisco Bay area. This activity illustrates which role Delta Alliance can play in the future.

Lastly, Delta Alliance worked on further strengthening its international position and cooperation, with focus on the cooperation with the Global Water Partnership (GWP)

## 1.4 Reading guide

For this review it was agreed with Knowledge for Climate to report on the first 2 activities (Comparative Assessment and Toolbox for Adaptive Delta Management) only. However, in order to give a full picture of the activities in the last year of Delta Alliance phase 3, the Delta Alliance team decided to add a mid-term update of its activities in San Francisco Bay, and a short description of its international network activities. Activities carried out before September 2013 are not reported here, but reported in earlier reports to Knowledge for Climate.

Chapter 2 describes how the Comparative Assessment method was applied to 4 new deltas. A full report on this activity is available and is part of the review documentation. Chapter 3 describes the web-based Toolbox for Adaptive Delta Management. In this chapter we mainly describe how the website is constructed; for the content the reviewers are referred to the website itself. Chapter 4 gives a midterm update of the Delta Alliance knowledge brokering activity in the San Francisco Bay area. The project will deliver its final result by the end of 2014. Chapter 5 gives a summary of the international program Delta Alliance has developed together with GWP. The report is concluded with some overall conclusions in Chapter 6.



## 2 Comparative Assessment

### **Introduction**

The purpose of the Comparative Assessment of deltas is to present a broad picture regarding the problems and sustainability of the major deltas in the world. It also has the advantage that it allows for comparisons to be made between deltas. By comparing deltas in different geographical contexts better insight can be gained regarding the interpretation of concepts such as resilience and sustainability, which are difficult to define and quantify.

Delta Alliance published the first Comparative Assessment in 2010 (available at [www.delta-alliance.org](http://www.delta-alliance.org)), describing 10 deltas. During phase 3 of Delta Alliance an extended version of the report was realised, by adding 4 delta's to the report, and thus describing 14 deltas in total. The report is written by Tom Bucx (Deltares), Wim van Driel (Alterra, Wageningen UR), Hans de Boer (TU-Delft), Susan Graas (UNESCO-IHE), Victor Langenberg (Deltares), Marcel Marchand (Deltares), and Cees van de Guchte (Deltares), and is entitled Comparative assessment of the vulnerability and resilience of deltas, *extended version with 14 deltas* - synthesis report, July 25, 2014. This chapter provides a short summary of this report. For the review we suggest the full report is taken into account.

### **Approach**

The Comparative Assessment combines the DPSIR approach with a Spatial Layer model. This integrated approach takes into account the different 'layers' of the delta system and related governance issues. Three physical planning layers are recognized: the *Occupation layer* (land and water use), the *Network layer* (infrastructure), and the *Base layer* (natural resources), each with different but interrelated temporal dynamics and public-private involvement. The advantage of this approach is that it is sufficiently generic to make it applicable for all deltas. The framework provides relatively easy linkage with governance issues and with the different actors and agencies involved in delta management.

*Table 1: The 14 deltas assessed by Delta Alliance and described in the report "Comparative assessment of the vulnerability and resilience of deltas, extended version with 14 deltas"*

Continent	Country	Delta
Africa	Egypt	Nile
	<b><u>Kenia</u></b>	<b><u>Tana</u></b>
	Mozambique	Incomati
	<b><u>Mozambique</u></b>	<b><u>Zambezi</u></b>
Asia	Bangladesh	Ganges-Brahmaputra-Meghna
	China	Yangtze
	Indonesia	Ciliwung
	<b><u>Myanmar</u></b>	<b><u>Ayeyarwady</u></b>
	Vietnam	Mekong
Europe	Netherlands	Rhine-Meuse
	Romania	Danube
N-America	USA	California Bay-Delta
	USA	Mississippi River Delta
S-America	<b><u>Argentina</u></b>	<b><u>Parana</u></b>

The 4 added deltas (marked in red in table 1) were treated in the same way as the first batch of 10 deltas. By means of score cards (summarized) delta descriptions were written. The overall synthesis and conclusions chapters in the extended report involve all 14 deltas. A separate working document with the full version of the four additional delta descriptions is available at [www.delta-alliance.org](http://www.delta-alliance.org). Each delta description is prepared by a Delta Wing Coordinator representing Delta Alliance in his delta (or another main contact person), who in most cases organized input from different (sector) experts.

## Results

Table 2 is copied from the conclusions chapter of the Comparative Assessment study. It presents the current state of affairs of each of the 14 deltas, based on the data on the 14 score cards. As was said, delta score cards were produced, one for each delta, by the Delta Wing Coordinator, often with the help of experts (the scores were not calibrated).

Table 2: Comparative overview of the score cards of 14 deltas studied

Current situation	Land and water use (occupation layer)	Infra-structure (network layer)	Natural resources (base layer)	Governance	Resilience & Sustainability Indicator		
					Current	Moderate Scenario	Extreme scenario
<i>Nile delta</i>	--	0	-	0	-	-	--
<i>Incomati delta</i>	0	-	-	-	-	-	--
<i>Tana</i>	-	-	-	0	-	-	--
<i>Zambezi</i>	+	-	+	-	0	0	-
<i>Ayeyarwady</i>	-	--	--	-	-	0	-
<i>GBM delta</i>	--	--	--	0	--	-	--
<i>Yangtze delta</i>	-	+	-	0	0	0	--
<i>Ciliwung delta</i>	--	--	--	-	--	--	-
<i>Mekong delta</i>	0	0	-	0	0	+	0
<i>Rhine-Meuse delta</i>	+	++	0	+	+	0	-
<i>Danube delta</i>	+	+	+	0	+	0	0
<i>California Bay-Delta</i>	0	-	-	0	-	0	-
<i>Mississippi River delta</i>	0	0	-	0	-	0	-
<i>Parana</i>	+	0	-	0	+	0	-

resilience/sustainability: ++ (very good), + (good), 0 (medium), - (low), -- (very low)

Columns 4-7 in Table 2 describe the deltas; the three columns on the right hand side give information about the sustainability of the different deltas under three scenarios. The colours in the table indicate the

level of sustainability (green presents the highest level, red to lowest). Clearly the Ciliwung delta, Indonesia, and the Ganges-Brahmaputra-Meghna deltas are the most vulnerable; in fact conditions in both deltas are presently unsustainable.

The comparative analyses allow for the identification of a number of research gaps. By aggregating the gaps research topics are identified that can become the topics of comparative, inter-delta studies. In particular opportunities exist regarding issues that were put forward as research gaps in multiple delta descriptions. Important issues for knowledge exchange and collaboration appear to be 'socio-economic scenarios', 'water use and treatment' and 'integrated spatial planning' (occupation layer), as well as 'freshwater management' and 'dikes and dams' (network layer). The most prominent field of potential inter-delta research cooperation concerns various base layer issues, ranging from monitoring and predicting changes, through understanding cause-and-effect relationships and ecosystem functioning, to natural safety and 'building with nature'. As to governance, the major issues identified for cooperation are 'governmental roles and arrangements' and 'integrated delta management'. Base layer (natural resources) and governance features (related to socio-economic conditions in a delta) are highly delta-specific; this needs to be acknowledged in inter-delta knowledge exchange and research collaboration. Comparative studies are useful, as a change of perspective can lead to new and unexpected opportunities.

Some additional questions which require attention are: which best practices are available that can be of use for other deltas?; which deltas are in lack of monitoring data to assess what is going on, and how can delta issues still be managed in data-poor deltas?; which issues are most relevant in urbanised deltas and which in rural deltas?

The results of this assessment help Delta Alliance to play its role as knowledge broker and define its research agenda.

# 3 Toolbox for Adaptive Delta Management

## **Introduction**

In compliance with its mission, Delta Alliance has started with the development of a 'Toolbox for Adaptive Delta Management'. The Toolbox provides guidance to delta managers in two ways:

- by offering the Adaptive Delta Management Approach. The Adaptive Delta Management Approach combines short and long term outlooks, provides guidance how to deal with uncertainties through adaptive management and scenario constructions, presents how to perform integrated assessments, focuses on the physical environment as well as socio-economic development, emphasises the need to involve stakeholders, and shows how to combine top-down and bottom-up governance;
- by gathering knowledge on the separate elements of the approach and by identifying and addressing knowledge gaps.

The aim of the Toolbox is to provide tailor-made solutions for delta problems in the Netherlands and abroad. The Toolbox is a joint effort of Judith Klostermann (Alterra, team leader), Fokke de Jong (Alterra, webmaster), Wim van Driel (Alterra), Fulco Ludwig (Alterra), Wim Douven (Unesco-IHE), Jaap Evers (UNESCO-IHE), Maaïke Maarsse (Deltares), Cees van de Guchte (Deltares), Tom Bucx (Deltares), Marcel Marchand (Deltares), and Hans de Boer (TUD). It was created in the period May and August 2014.

The results of this activity is the first version of a web-based Toolbox, available on the Delta Alliance website at <http://www.delta-alliance.org/Toolbox>). We suggest the reviewers use this website to further inform themselves.

## **Approach**

The tools are useful in different stages of delta development. The different stages are 'agenda setting', 'problem analyses', 'strategy development', 'implementation', 'monitoring and evaluation'. A phase model (available on the internet site) was developed to visualize the phases. The stages are defined as is shown in Table 3

*Table 3: Planning cycle of the Adaptive Delta Management Approach*

1. Agenda setting	In the agenda setting phase, important issues are how a problem is framed, who is the 'problem owner' and who else should be involved. 'Framing' implies how the story of the problem is told: a theory on causes and effects and the likely moral consequences of that story. Is it a public or a private problem? Who is morally obliged to act? Who have a say in the decision making process and who have not? The agenda setting phase is often depicted as the first phase, but in practice it is an intermediate phase in a messy, ongoing process.
2. Problem analysis	In the problem analysis phase some resources are made available to investigate the status of the problem and to gain more information on causes and effects. This can involve science, but it can also be based on practical experience, governmental departments providing documentation, public hearings and so on. Most likely this phase will change the previous framing of the problem as it provides better information on causes and effects.
3. Strategy development	In the strategy development phase potential solutions are assessed. The strategy development phase can build on the problem analysis phase, but it can also evolve directly from the agenda setting phase (if people feel they already know how it works). In this phase future scenarios are often used. To bridge the gap to the implementation phase it is wise to include experiments and pilots in this phase.
4. Implementation	The implementation phase comprises the decisions on measures and the actions to install them in practice. This is the most complicated phase as it requires the confrontation of ideas with practical reality. It also requires persistence and negotiation skills. It may be necessary to take a step back to previous phases of problem analysis and strategy development.
5. Monitoring and evaluation	Monitoring and evaluation comprises the collection of data on process, output and outcome of a policy, as well as drawing conclusions on that information about the progress of the policy. Monitoring and evaluation is often seen as the last phase that can be started once implementation is well underway. However, monitoring and evaluation can already help in the problem analysis phase and may improve the implementation process from the start.

The Toolbox itself consists of three parts: an overall approach and guideline; factsheets on existing tools; and identified knowledge gaps requiring new research coalitions. The overall approach describes adaptive delta management and presents a guideline how the process can be organized. The underlying assumption is that a delta has to be managed as a complex system consisting of different parts that cannot be looked at in isolation, but have to be studied and managed in combination with the other parts. A plan has to be integrated, interdisciplinary and long term. Within the framework of the Toolbox, Marcel Marchand (Deltares) and Fulco Ludwig (Alterra) wrote the paper 'Towards a Framework for Adaptive Delta Management (June 2014)'; it is available at the website.

The second part is an overview of specific tools that fit somewhere in the process of adaptive delta management. Many tools already exist. They are described in an attractive and understandable way. The team created a format for a factsheet, including pictures and diagrams showing what a tool is, how it can be used and what the results will be like. The tools are not static; they can be developed further in an interactive process. The framework for tool description that was used is presented in Table 4.

Table 4: Framework for tool description, Delta Alliance Toolbox for Adaptive Delta Management

1.	Tool name	Preferably a short name that is easy to remember (1-6 words)
2.	Purpose of the tool	What kind of knowledge does it provide and how does it help in the process; tool category (30-40 words)
3.	Tool description	How does it work, what kind of expertise does it involve, what kind of data are needed, how long does it take to use it, etc. (100-200 words)
4.	Result description	Example of a result such as a graph, a conclusion, a map, a photo, etc. in colour with a thorough description what this result means (50-100 words; figures, graphs and photos max 1Mb per item considering potentially slower internet of the intended users in many countries)
5.	Picture	
6.	The tool in practice	In which deltas has it been applied, is it a pilot or a mature technology, citation of someone who has used it, more pictures (100-200 words; figures, graphs and photos max 1Mb)
7.	Picture	
8.	Necessary inputs and conditions	What technical and social conditions are needed for the tool to be successful, for example, hardware, data, a stable government (30-40 words)
9.	Contact data	Institute, city, contact person, email, telephone, hyperlink to organization / tool website
10.	Phase Tool category	We expect a subdivision in tools will be necessary for the website to remain attractive; which categories we will use is not clear yet. See excel for preliminary version
11.	Target group	For whom is the tool meant, kinds of users
12.	Spatial scale Time scale	Spatial scale ranging from global through river basin to local; time scale from century to seconds?
13.	Tool availability	From free online, via more difficult tools that require some assistance, to complex tools requiring hired expertise
14.	Downloads	A brochure, summary or other downloadable pdf document of no more than 1-2 Mb.

Selected researchers, all active in delta development or management, were approached with the request to produce a tool. Producing a tool required about 3 hours from a researcher, including final editing, which is done with input from the Toolbox' editor. A total of 42 tools were requested; 25 tools were realised, and 17 tools are forthcoming.

### Results

Table 5 provides an overview of the tools that have been produced so far and for which of the 5 stages of the management cycle. Some tools are helpful in more than one stage. As can be seen more tools are needed to complete the pallet of useful instruments to assist delta managers and researchers. Some already existing tools need further upgrading. The Toolbox is an evolving instrument: less useful tools are taken out, new ones are added, and if necessary even the framework / backbone is revised or refined. As there are still tools underway, the Toolbox as it stands could not be assessed for its completeness yet. However, the several empty cells in Table 5 are an indication that of the knowledge gaps requiring new research coalitions (part 3 of the Toolbox).

The Toolbox has another sophisticated feature. Users of the Toolbox on its internet site can assess the 'Delta viewer': a digital global map with pins where tools have been applied.

The Toolbox is a continuous evolving instrument and the current version should be seen as a start. In the near future the following activities will be carried out: (i) the publication of Marchand and Ludwig, a core document of the Toolbox, should be more prominently visible; (ii) the names of the tools should give a

better indication of what the tool actually does; (iii) more tools will be made available; and (iv) representatives of Delta Alliance Wings and knowledge workers from other deltas in the world will be invited to add the tools that they consider useful (a Delta Alliance web manager/editor will provide assistance and quality control).

Table 5: Overview of the 25 available tools by management stage

Phase	Integral approaches	Conceptual tools	Physical models	Governance	Economic tools	Case studies	Pilots and experiments	Proven technologies
1. Agenda setting	1. AfroMaison Spatial Data Infrastructure (SDI)		1. PlanningKit	1. Sustainable Delta Game				
2. Problem analysis	1. Climate Adaptation Atlas 2. FAO GeoNetwork		1. DIMO: Plant Dispersal Model; 2. NTM, model for the biodiversity index 3. RIBASIM 4. LARCH, Connectivity of the landscape for plant and animal species 5. VSD+ SUMO, Modelling soil and vegetation processes 6. WaterGuide Agriculture 7. APFM Flood Management Tools Series					
3. Strategy development	1. Strategy Development Method (SDM) 2. Climate App: an adaptation support tool 3. DENVISS 4. Dynamic Adaptive Policy Pathways (DAPP)		1. PROPS, Probability of Occurrence of Plant Species 2. Waterwise 3. LARCH, Connectivity of the landscape for plant and animal species 4. VSD+ SUMO, Modelling soil and vegetation processes 5. WaterGuide Agriculture 6. CLUE model 7. Waterwise		1. Decision Support Tool for Economic Instruments in NRM 2. Eurekaopener			
4. Implementation			1. APFM Flood Management Tools Series	1. Adaptive Capacity Wheel			1. Building with Nature	
5. Monitoring and evaluation	1. FAO GeoNetwork		1. APFM Flood Management Tools Series 2. Scenario Studies using Habitat Modelling	1. Participatory Monitoring				



## 4 San Francisco Bay (mid-term update)

Delta Alliance has been active in San Francisco Bay since 2009 with the Partners for Water funded project 'San Francisco Bay – Preparing for the Next Level,' and support from Delta Alliance. It was the starting point of a fruitful collaboration. Since that moment the partnership has continued with various missions back and forth and attendance of conferences between the Netherlands and California. In 2013 the idea was born for a follow-up project. Where the first project focused on San Francisco Bay as a whole, this project focuses on the shoreline of the City of San Francisco specifically.

San Francisco Bay – Preparing for the Next Level was done in collaboration with a local California state agency called the San Francisco Bay Conservation and Development Commission (BCDC). BCDC is now the Delta Alliance Wing Coordinator for California. For this new project BCDC was the broker between Delta Alliance representatives and various City Departments of San Francisco to find a suitable and challenging location. With Delta Alliance funding in place (€60.000) the City was able to match the funding and provide \$110.000 towards the project. Given San Francisco's vulnerability to the impact of sea level rise a study was contemplated on how to adapt part of the City of San Francisco shoreline to rising sea level.

The adaptation planning project will focus on the Mission Creek area, situated on the northeast side of San Francisco. Mission Bay, the largest development project in the Mission Creek area, is rapidly developing from a former rail yard into a vibrant neighbourhood with a new university research campus, new jobs, offices, housing, parks and open spaces, and commercial retail areas, including a hotel. The picture below gives an impression of the coastline and the new development.



Figure 2: Mission Bay Project Area in San Francisco

This Project seeks to build the capacity of San Francisco to address the risks of flooding from sea level rise and storms by developing adaptation alternatives for the Mission Creek area and to continue the exchange of knowledge and information between the Netherlands and California (United States). The four main Project objectives are:

- Develop sea level rise and storm water adaptation alternatives for the Mission Creek area portion of the City's waterfront, including assets within the Mission Creek area, based on the findings of a high-level vulnerability assessment.
- Apply the lessons learned from the Adapting to Rising Tides (ART) project in Alameda County to the Project area.

- Further develop and refine the adaptation Strategy Development Method (SDM) to incorporate equity, finance and governance in the selected adaptation methodologies.
- Exchange knowledge and best practices on climate adaptation between the Netherlands and California.

The project is divided up in 4 major tasks:

- *Task 1: Project scoping and organization* – this task consists of review of existing data, familiarizing the project participants with the latest developments in the Netherlands and California on climate change and refining the project scope.
- *Task 2: Conduct High-level Vulnerability Assessment* – consists of reviewing of existing sea level rise modelling data, and existing, authorized and proposed development for the Mission Creek area, advancement of the sea level rise modelling to establish depth of inundation and flow paths and a sensitivity and adaptive capacity analysis.
- *Task 3: Dutch Team Site Visit* – although the Dutch team won't be on the ground for the entire project they will be actively engaged via internet, video calls and phone exchanges. However, they will visit San Francisco for a full week to visit the project site and work shoulder to shoulder with the other project partners.
- *Task 4: Develop and Evaluate Adaptation Approaches* - Task 4 is the most labour intensive task in this project. Over 50% of the total level of effort will be spent on this task. Development of adaptation responses as a set of actions that, together, address one or more climate change vulnerabilities identified in Task 2. Adaptation measures considered will include structural measures (levees, floodwalls, etc.), soft measures (wetlands, beaches, natural shoreline, etc.), water management solutions, governance, policy, and financing. The conclusions on governance and policy include recommendations on how this project fits into SF Adapt and how next steps can be coordinated among the family of City agencies involved.

Final project deliverables are a technical report containing data, maps, interim reports from the project, lessons distilled from the other adaptation processes, a clear explanation of adaptation strategies and alternatives for the project area and an 'executive summary' type of report that distills the most important findings, visual information, and alternatives from the technical report that is more accessible to a broader audience

Although the project is still in full swing many positive outcomes can be reported. At time of writing, tasks 1 through 3 have been completed. The week of the Dutch site visit was very successful. The week included field tours, design charrettes and staff meetings with BCDC, the Port, SPUR and other City Staff to discuss initial finding and conceptual adaptation approaches. In addition, the Dutch team held individual meetings with key stakeholders, including city agencies and development entities to understand the key characteristics of the potentially affected/impacted assets and understand opportunities and challenges for adaptation planning. Below are photos from these meetings (Figure 3).



Figure 3: Design Charrette at the Port of San Francisco and the project team visiting Mission Bay with city representatives and community leaders

The San Francisco Chronicle also wrote about adaptation challenges in San Francisco Bay and how Delta Alliance is helping San Francisco on this matter:

<http://www.sfgate.com/bayarea/place/article/S-F-waterfront-development-must-prepare-for-5536682.php?cmpid=hp-hc-bayarea#page-1>

*"...One promising initiative that could serve as a model is along Mission Creek: Several city agencies are working with the conservation and development commission, the planning advocacy group SPUR and the Delta Alliance of the Netherlands. The idea is to approach the half-mile-long passage holistically, including possible changes to the shape and breadth of the shoreline..."*

*"...The Bay Area isn't the only region in a bind; that's one reason for the interest in Mission Creek from the Netherlands, a nation where much of the population lives below sea level. Thinking beyond the here and now is what smart governments do. But the responsibility rests with all of us. Our grandchildren will know whether we were equal to the task..."*

# 5 Cooperation with GWP

## **Introduction**

Global Water Partnership (GWP) and Delta Alliance (DA) developed the 'Enabling Delta Life Initiative': a Global Programme of Actions on Deltas, with support from the Netherlands International Development Programme (DGIS). This programme will be part of the Global Water, Climate and Development Programme (WACDEP) of GWP and will be jointly implemented by GWP and Delta Alliance. The developed proposal gives an extensive description of the Enabling Delta Life Initiative and will be presented for appraisal by and discussion with potential funding agencies. There is a potential for a modular approach in the implementation of the Initiative, such as initiating the work in specific deltas or targeting specific parts of the programme. Through funding applications the approach will be further refined and enriched. This chapter gives a summary of the "Enabling Delta Life Initiative: a Global Programme of Action on Deltas".

## **Objective**

The overall aim of the Initiative is to enhance climate resilience and to strengthen the governance and adaptive management of delta's worldwide.

The unique structure of the collaboration between GWP and Delta Alliance and GWP are the important assets of extensive international and local networks, as well as strong knowledge on Adaptive Delta Management and Integrated Water Resources Management. The local networks guarantees that grass root delta information is used to develop realistic generic approaches that are technically, ecologically, financially and scientifically sound as well as socio-economically acceptable. Jointly GWP and Delta Alliance offer an important platform at which exchange of knowledge and expertise is taken place among actors at the different scales. This Initiative is a 'knowledge for impact programme' by developing and assembling knowledge in such a way that it can easily be taken up by policy makers and practitioners. As such, knowledge functions as a 'catalyser for change' and Delta Alliance and GWP will play an important role as knowledge brokers.

## **Programme Structure**

The Initiative is built around three strategic goals i) Catalyse change; ii) Generate and share knowledge; iii) Strengthen partnerships, and is then divided into eight Work Packages (WP) for implementation of the goals. WP 5 which includes developed projects in five deltas, and WP 7 on knowledge and awareness raising through Comparative Assessments and the ADM and IWRM Toolboxes, form the backbone of the programme, and the different programme work packages feed into each other and are closely connected. See programme structure in Figure 4 below.

## **Project backbone**

Comparative delta assessments worldwide will highlight vulnerabilities of deltas to climate change and other pressures and allow good targeting of actions. The existing knowledge base will be enriched through further development of the ADM and IWRM Toolboxes, for example through the implementation of the developed delta specific projects. The following delta specific projects (WP5) were formulated during stakeholders' consultation workshops held in 2012 and 2013 in five deltas:

- Ganges-Brahmaputra delta in Bangladesh: Building climate resilience in the Bangladesh delta by managing for effective solutions
- Ouémé delta in Benin: Improve the conditions to ensure sustainable management and to stimulate development in the Ouémé delta
- Nile delta in Egypt: Improve the capability of the farmer community to deal with water stress
- Ayeyarwady delta in Myanmar: Vulnerability assessment and impacts of salinity intrusion on drinking water supply, agriculture, aquaculture/fisheries and nature
- Mekong delta in Cambodia/Vietnam: Improve climate resilience in the provincial Cambodia-Vietnam trans boundary Mekong delta

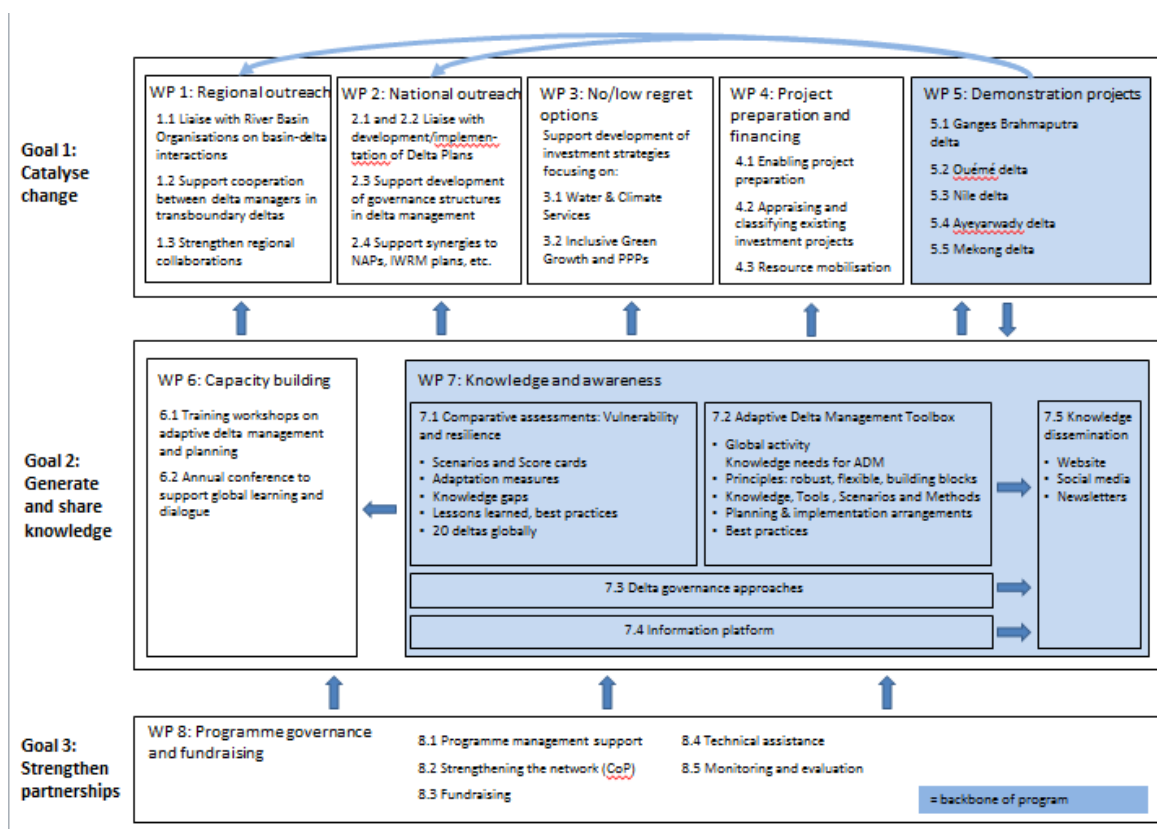


Figure 4: Programme structure

Through the delta specific projects a global understanding of delta systems is translated into local actions. For the application of the projects there is no 'one-fits-all' delta approach. In contrast, tailor made delta approaches are required for each specific case addressing delta issues as illustrated by the five demonstration projects.

The three activities (Comparative Assessments, Toolboxes and Delta projects) are strongly interconnected and will generate new knowledge on how to improve the resilience of deltas, which in turn will feed into a set of capacity building, knowledge sharing and reach-out activities at national, regional and global level. The Initiative will build on to and collaborate with other existing (inter)national initiatives, networks and organisations dealing with climate change, water management and sustainable delta development, such as CDKN, UNEP, UNDP, UNFCCC, Belmont Forum, etc.

### Linkages between work packages

The local demonstration projects need up-scaling to the national (WP 2) level (e.g. for the development of national delta plans), as well as to the greater (trans boundary) river basin (WP1) level (e.g. to inform River Basin Organisations on the impact of upstream activities on the function of the delta system) and to the global level (e.g. to improve the Toolboxes and Assessments). The IWRM and trans boundary water expertise of GWP is crucial for this up-scaling. This is an iterative multiple learning exercise for which GWP and Delta Alliance and their networks together form an outstanding platform. This up-scaling approach guarantees that sound generic approaches are formulated based on in-depth local delta knowledge and expertise. In addition, down-scaling of sound generic approaches and inter-delta cooperation can contribute to locally implement the most efficient, effective and innovative delta solutions.

Given the uncertainties with regard to the degree of climate change and its local impacts the Initiative intends also to support national governments and partners in the Delta Alliance and GWP networks in the development of no/low regret investment options (WP 3) such as water & climate services (including monitoring activities) and inclusive Green Growth projects.

Since weak project preparation and prioritisation of adaptation interventions is still one of the major factors limiting developing countries from accessing climate funds to support adaptive delta and water management, the programme foresees to assist national governments and partners in the Delta Alliance and GWP networks to prepare sound project proposals (WP 4).

All the activities mentioned above relate to horizontal (e.g. between delta) and vertical exchange of knowledge and expertise between local, national, regional and global levels will contribute to the strengthening of network(s) on delta management. The network will be supported by the Programme Management Office (WP 8.1), annual conferences (WP 6.2), information platform (WP 7.3), website

and newsletters (WP 7.4). In addition the establishment of a global Community of Practice (WP 8.2) on delta management is foreseen.

**Programme management and duration**

The Enabling Delta Life Initiative will be jointly developed, implemented and managed by GWP and Delta Alliance. It will be overseen by a Joint Steering Committee, consisting of representatives of GWP, Delta Alliance and important funding agencies and cooperation partners.

A lean coordination hub (Programme Office) for the whole programme will be setup and staffed with a programme coordinator, that will be mandated to interact with all parties. This will be a shared responsibility of Delta Alliance and GWPO. The programme management will use up-to-date Project Monitoring and Evaluation procedures, guaranteeing that projects are carried out in a transparent, accountable and efficient way at minimum overhead costs, and will see to it that global partnerships are strengthened.

The larger part of the programme implementation will be decentralised and managed by the Delta Alliance Wings and the GWP regional and country offices. The global component of the programme will be implemented through Delta Alliance and GWPO, ensuring exchange and technical support to the regional components.

The duration of the programme is at least 3 to 4 years and is negotiable with the potential funding partners.

**Budget and funding**

The budget of the total program is estimated at 10.2 million Euros. GWPO and Delta Alliance will jointly approach potential funding agencies to raise the funds for the realisation of the Initiative. This document will be presented for appraisal and discussion to potential funding agencies.

Table 6: Total Programme Budget (K€, still indicative)

	2014	2015	2016	2017	Total
<b>WP 1 National outreach</b>	100	300	300	300	1,000
<b>WP 2 Regional outreach</b>	100	200	200	200	700
<b>WP 3 No/low regret options</b>	100	300	300	300	1,000
<b>WP 4 Project preparation/funding</b>	50	150	150	150	500
<b>WP 5 Demonstration projects</b>	400	900	900	800	3,000
<b>WP 6 Capacity building</b>	150	250	250	250	900
<b>WP 7 Knowledge generating/sharing</b>	400	600	600	400	2,000
<b>WP 8 Programme management</b>	200	300	300	300	1,100
<b>Total</b>	1500	3000	3000	2700	10,200

# 6 Conclusion

In line with the recommendations from the mid-term review Delta Alliance has:

1. Strengthened the Netherlands Wing, with commitment of the main knowledge institutes in the Netherlands to work through Delta Alliance in the pre-competitive stage.
2. Agreement with the Dutch Ministry of Infrastructure and Environment, the Ministry of International Trade and Development Cooperation, The Delta Commissioner on activities to be carried out by Delta Alliance, including funding for the period September 2014 – December 2015 and the intention of multi-annual funding.
3. The two activities, defined as the backbone for Delta Alliance in terms of knowledge compilation, received ample attention and show progress. The earlier performed Comparative Assessment was further developed and applied to 4 additional deltas. In addition, the Toolbox for Adaptive Delta Management was set up. Delta Alliance plans to continue working on these two activities in order to provide (i) an up to date overview of the deltas in the world in terms vulnerabilities, possible interventions and important actors (the atlas), and (ii) a set of tools, methods and approaches that can help change agents to increase resilience in these deltas.
4. One specific knowledge exchange activity was carried out in California, where Dutch knowledge and experience was used to develop adaptation scenarios with local stakeholders for the San Francisco Bay area.
5. Delta Alliance has further developed a strategic link with the Global Water Partnership, which resulted in a joint programme of action on deltas. The programme is part of the general GWP programme, but funding still needs to be secured from third parties.
6. Delta Alliance has favourably responded to a request from UNEP-DHI to participate in the River Component of the GEF funded Trans-boundary Water Assessment Programme. Through this programme not only 26 more deltas will be added to the assessment database, but it also provides a great opportunity to contribute directly to managing pressing delta problems.

We believe that with these results Delta Alliance has made optimal use of the resources put at its disposal and is ready to enrol in a new period with a clear and recognised strategy, secured funding for basic activities, international recognition, and two strategic tools for knowledge compilation in place.