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## **An analytical framework for strategic delta planning: negotiating consent for long-term sustainable delta development**

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### **Abstract**

*Sectoral planning on water, agriculture and urban development has not been able to prevent increased flood risks and environmental degradation in many deltas. Governments conceive strategic delta planning as a promising planning approach and develop strategic delta plans. The plan is linked to actions and means for implementation on the short-term, in line with long-term strategic choices. This paper introduces an analytical framework that focuses on the role of actors, innovative solutions and participatory planning tools in negotiating consent for the strategic choices in a delta plan and its implementation. Cases of Bangladesh, the Netherlands and Vietnam are discussed as a plausibility probe to explore the framework's potential. The probe reveals that the framework is promising to explain the process and outcomes of strategic delta planning in urbanising deltas. The paper ends with an initial research agenda to stimulate research and discussion on this new delta planning approach.*

**Keywords:** strategic planning, deltas, consent, actor coalitions, innovations, participatory planning tools

### **1 Introduction**

Strategic delta planning increasingly gains attention in the water sector to come to a more sustainable development of deltas. Deltas are located between rivers and coasts and they

provide an attractive environment for human settlements. They connect seaward commercial trade with inland shipping, provide valuable resources for society (e.g. oil, gas, fish), offer fertile land for agricultural food production and present a unique natural environment. About 500 million people live in deltas worldwide (Kuenzer et al., 2012; Syvitski et al., 2009) of which 80% live in 14 deltas (Bucx et al., 2010; Bucx et al., 2014). Sustainable delta development implies a balance at the delta level for current and future generations on human needs, economic objectives and environmental concerns.

Due to strong social-economic developments, conventional delta planning can never completely resolve the development challenges many urbanizing, engineered deltas face: rapid urbanization, industrial growth, infrastructure expansion, agricultural intensification, floods, subsidence, salinization and degradation of the environment (Giosan et al., 2014; Kuenzer et al., 2012; Nguyen and James, 2013; Nicholls et al., 1999; Renaud et al., 2013; Syvitski et al., 2009). Given the interrelated nature of these development challenges, their complexity and related uncertainty, governments are initiating long-term strategic delta planning processes to come to more sustainable delta development under different socio-economic circumstances; examples are Bangladesh, Myanmar, the Netherlands, the United States of America and Vietnam (BanDudeltas, 2014; CPRA Louisiana, 2012; Deltacommissie, 2008; Royal HaskoningDHV et al., 2013; Royal HaskoningDHV et al., 2014).

In this paper we define strategic delta planning as a public-sector led process through which a long-term vision (the strategic delta plan), actions and means for implementation are produced that shape and frame what a sustainable delta is and may become (after Albrechts, 2004: 747). Key characteristics of strategic delta planning are a long-term planning horizon of 50 to 100 years and strategies that cover multiple policy domains such as urban planning, industry, transport, agriculture and water. Furthermore, strategic delta planning aims to influence and guide developments towards sustainable delta development by making strategic choices. The problems that are addressed are inherently complex or wicked (Rittel and Webber, 1973; Hartman, 2012) due to the uncertainties, the interconnectivity of delta problems and the different interests and (spatial) claims of actors involved (Norgaard et al., 2013).

Due to these characteristics, strategic delta planning differs from conventional delta planning (see Table 1). Conventional delta planning is characterized by short 4-6 year planning cycles

and sectoral master plans that have ambitious targets but lack overall coordination or prioritization across master plans (BanDuDeltas, 2014; Royal HaskoningDHV et al., 2013). A strategic delta plan provides a framework in which other policies, programs and projects can be developed as a congruent set of development objectives. The plan influences implementation towards a strategic priority without controlling the outcomes as over time new technologies, actor coalitions and strategic options may emerge – i.e. outlining strategic directions of developments that policies may target to facilitate. The strategic delta planning approach has evolved from other planning approaches in the water sector<sup>1</sup>.

(Table 1 may be inserted about here)

The objective of this paper is to explore the validity of an analytical framework that may support a better understanding of strategic delta planning processes. Most research on strategic delta planning has focused on the content in the planning process (Klijn et al., 2015, Prinsen et al., 2014), the connection between knowledge and policy (Werners et al., 2015) and framing as a strategy for agenda setting and policy adoption (Boezeman et al., 2013; Verduijn et al., 2012; Vink et al., 2013). To date, no frameworks have been presented to analyze strategic delta planning as part of a longer-term development process in deltas and the connections and disconnects between past development efforts, new planning and implementation. This is relevant as delta planners require -due to the wicked problems they are confronted with- something else than a detailed plan to strategically influence developments in a delta. Instead, delta planners have to seek consent on the strategic choices and contours of a strategic delta plan with many organizations and individuals who have significant power in enabling, constraining or contesting implementation. These may range from powerful decision-makers to formal planning bureaucracies and from societal movements and networks to informal influential scientists that operate out of public view.

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<sup>1</sup> The command and control style of river basin planning as well as sectoral (long-term) master planning is not well equipped for the multiple problems and claims of actors in urbanising river basins and deltas. Integrated water resources management, integrated coastal zone management and integrated flood risk management have all put integration and integrated approaches high on the agenda, yet they all integrate with one specific purpose in mind (water resources, coastal zones, flood protection). This provided limited guidance on exposing cross-sector inconsistencies in development aims and making well-balanced choices in the short- and long-term on for instance agriculture or industry at the delta level.

Strategic delta planning thus becomes a challenging process of seeking ways to accommodate the interests of actors such that there is consent for a strategic delta plan, funding and implementation projects. Consent, and the process of negotiating consent with powerful and influential actors, thus emerges as a relevant concept that could explain the positioning of strategic delta planning processes within longer-term processes of delta development, planning and implementation. In this paper we postulate the hypothesis that the degree of consent reached on the strategic delta plan (be it forged by enforcement or accommodation) is determinant of the degree in which the strategic plan is able to shape the subsequent policies and developments over its lifespan 10 to 20 years.

The narrative of the paper is as follows. This paper is about strategic delta planning and its role in longer-term processes of delta development. Since strategic delta planning covers different socio-political interests, involving different interests and spatial claims, , consent is a key feature to explore the impact of strategic delta plans in guiding delta developments towards sustainable delta development (Sect. 1). The aim of this paper is to introduce an analytical framework ‘the Hourglass’ for strategic delta planning processes, and explore whether it is a meaningful concept to understand how strategic delta planning process work, and what determines their successes and weaknesses.

To explore whether the framework is meaningful or not, we will apply it in the strategic delta planning cases of Bangladesh, the Netherlands and Vietnam (Sect. 3). The probe confirms the potential usefulness in explaining processes and outcomes of strategic delta planning (Sect. 4). Having established the potential usefulness, further research is needed to analyze how consent is negotiated and how successful strategic delta planning processes are (Sect. 5).

## **2 Methodology**

### **2.1 Strategic spatial planning**

The framework is informed by insights from the field of strategic spatial planning (cf. Albrechts, 2004; Faludi, 2000; Friedmann et al., 2004; Healey, 2009). Strategic spatial planning refers to collective efforts to re-imagine a specific region and to translate the result into priorities for area investment, conservation measures, infrastructure investments and principles of land regulation (Healey, 2004). It is aimed at changing the minds of people through the development of strategic spatial plans (Faludi, 2000; Laurian et al., 2004; Talen, 1996). Strategic spatial planning processes may vary in their degree of selectivity and

stakeholder involvement (Bafarasat, 2014). The main difference between strategic delta planning and spatial planning is the scope. Strategic delta planning addresses the strong interplay between the social-economic and physical-ecological system (e.g. rivers, mangroves, wetlands, coasts) meanwhile taking into account upstream interventions, whereas strategic spatial planning mostly focuses on the urban environment (Friedman et al., 2004; Healey, 2009). As a result, strategic delta planning is broader in scope since sets of strategies have to be congruent across spatial (local, regional, national, river basin) and temporal scales.

Various frameworks have been developed to analyze strategic spatial planning processes. Some focus on the strategic planning and decision-making part (Albrechts and Balducci, 2013; Healey, 2009) whereas others focus on strategic spatial planning through projects (Bafarasat, 2014). However, as Albrechts and Balducci (2013) state, the connection *between* planning and implementation of plans is hardly made. One exception is Faludi (2000) who provides a learning perspective to connect planning and implementation. The limited attention to connect planning and implementation is a serious limitation to understanding strategic delta planning processes. They take place in the public domain, and are both about content – formulating a strategic delta plan – and about implementation to contribute to a more sustainable development of deltas. Providing a framework that analyses both the planning and implementation may therefore respond to the limited attention for implementation and action in strategic planning (Albrechts and Balducci, 2013). It is unrealistic to expect a 1:1 implementation of a strategic delta plan – a pitfall of master plans that are often ‘dead on arrival’ (Brody and Highfield, 2005). Instead, the aim of strategic delta planning is to influence delta developments through political support and investment into a specific direction of strategic development choice(s) (or trajectories) without controlling the outcomes as new technologies, insights and actor coalitions may push developments into a different direction, or establish alternative development options that have not been contemplated.

We focus on negotiating consent as the connecting element between planning and implementation in strategic delta planning. Negotiating consent is a more practical interpretation of the term consensus<sup>2</sup>. It is not so much about seeking consensus, but more

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<sup>2</sup> Consensus (building) is commonly used in conventional planning, negotiated agreements and strategic spatial planning (Innes, 1996; Faludi, 2000; Friedmann et al., 2004; Susskind et al., 1999).

about seeking ways through which different interests of actors can be accommodated such that different actors are prepared to 'go along with' (Checkland and Scholes, 1990). The strategies or plans for which consent has been accommodated may then reflect an improvement of the current state of affairs in the delta. There is not one 'best' outcome for strategic delta planning, instead, multiple options and perspectives may exist on how to develop a delta. As a result, a variety of actors, problem frames and solutions have to be accommodated to gain support for planning and implementing a strategic delta plan. Negotiating consent thus becomes a simultaneous process of social learning to change the minds of people and an opportunistic support seeking process to ensure that sufficient actors can go along with the plan. The latter implies that potential participants, issues and substantive outcomes may be excluded when that would frustrate or weaken the consent (Connelly and Richardson, 2004). Depending on which powerful and influential actors support a delta plan, consent may be strong and long-lasting or weak and momentary. With strong consent it is more likely that the actions in the implementation phase are congruent with the earlier defined strategic aims to come to sustainable delta development.

## **2.2 Decision-making in strategic delta planning**

The decision-making process of strategic delta planning is characterized by three different phases of agenda-setting, strategic delta plan formulation and implementation. Negotiating consent is the linking pin between planning and implementation. We distinguish phases for analytical clarity while acknowledging that the distinctions between phases may be too theoretical as in practice the phases may overlap (DeLeon, 1999; Nakamura, 1987). The phases are connected to two identifiable decision-moments, that of developing a strategic delta plan and the decision to accept the plan. Implementation is analysed by exploring if policies and projects are congruent with the desired long-term development of the delta. The phase of agenda-setting is the initial stage of a strategic delta planning process. It refers to putting the topic of strategic delta planning on the agenda. Determining the agenda for the strategic delta planning process is a struggle wherein political actors try to create space for a strategic delta planning process. During this phase, actors have to learn how strategic planning may overcome the shortcomings of traditional planning (Albrechts and Balducci, 2013). Awareness and appreciation has to be raised with politicians and other societal actors that the integrated and congruent approach of strategic delta planning is needed to come to a more desirable future of the delta and for instance moving away from more traditional

sectoral approaches like hard engineering measures, degrading wetlands and eroding coastlines (Giosan et al., 2014). Due to uncertainties and long term developments, awareness has to be raised that alternative scenarios for sustainable delta development exist. It is in this phase that actors strive to have ‘their’ problem formulation accepted as the legitimate basis for the formal planning process; the main agenda and key issues for strategic delta planning are determined. Actor coalitions are formed and problems and initial solutions are framed. In analytical terms, the planning process moves into the next phase when the decision has been taken to formulate a strategic delta plan.

The second phase is the strategic delta plan formulation stage. Similar to strategic spatial planning, it is focused on a strategic (delta) plan that can be backed by political support and serve as frame of reference for future project plans (Faludi, 2000). Usually, a clear time-line of one to a few years is set for the development of a plan. Actors are involved in a process of negotiating consent for a political decision since delta plans have to be approved and endorsed by national governments. This political commitment is needed, since the plan describes (at the delta level) the strategic priorities, the developments needed and the means for implementation. Due to these political and time pressures involved, the planning process has to converge from an initially broader agenda to a focused strategic delta plan that is widely supported. The planning process moves into the third phase when a political decision has been taken to accept the formulated strategy/plan.

The third phase is that of implementation. Different policies, programs and projects contribute to the envisioned long-term development of the delta. Many of these implementation policies and projects will have existed prior to the formulation of a strategic delta plan, but in this stage, where necessary, they would have to be re-oriented to give reality to the earlier decided strategic direction (Albrechts and Balducci, 2013). The decision-making context may change from a national perspective in strategic planning to a more local-regional perspective in implementation. Given the change from a national to local and regional perspectives, and the multitude of policies and programmes involved, divergence is expected to occur from the original strategic delta plan. Issues may return that were previously excluded since they were hampering consent at the delta level. Alternatively, solutions and actor coalitions may change as motivations and abilities of local actors differ from those involved in the strategic delta plan formulation phase (Phi et al., 2015).

Divergence may still resemble the spirit of the strategic choices but supplemented with local preferences and opportunities, and thus local consent for implementation.

## **2.3 Strategic delta planning as an Hourglass**

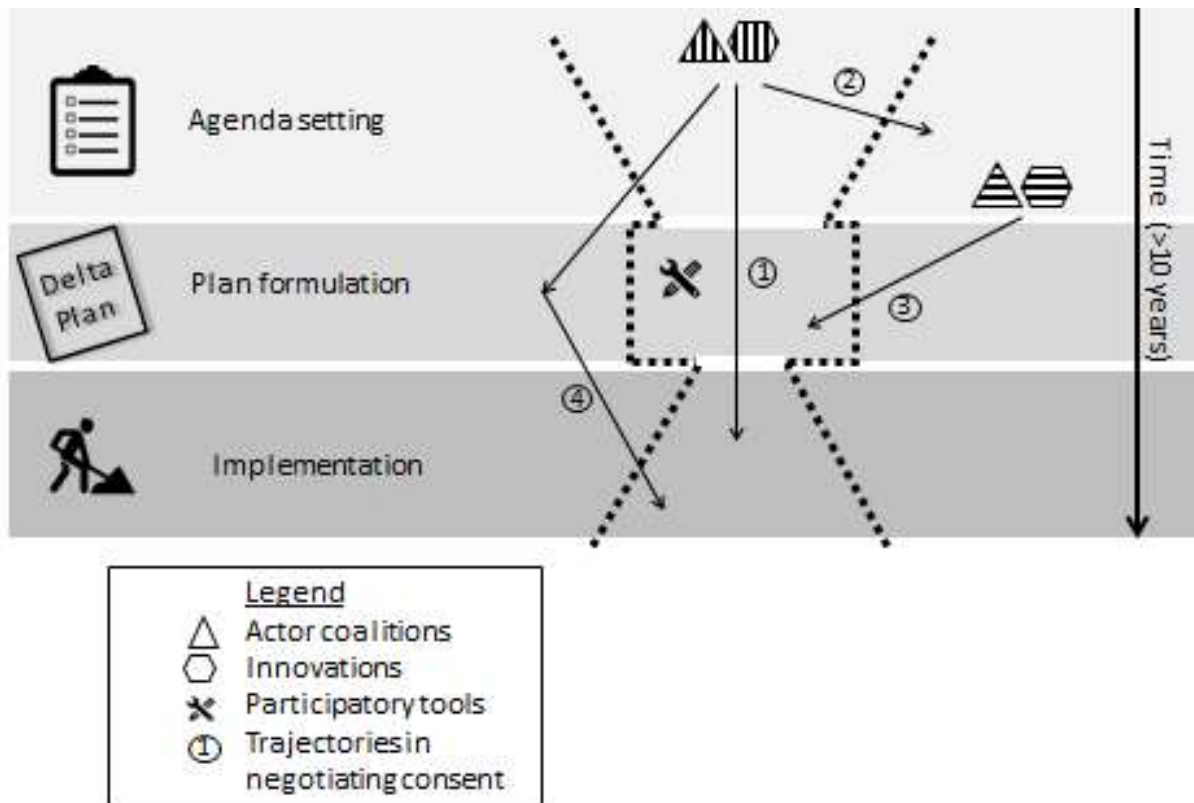
Due to the (theorized) convergence and divergence on strategies for long-term development of the delta, we symbolize strategic delta planning as an Hourglass (see Figure 1). Over time, a planning process may move down in the Hourglass, probably with many stops and starts. Dynamics and progress in the Hourglass are affected by the wider context of politics and institutions, formal and informal rules of decision-making and prevailing cultures of (participatory) planning and negotiation (Briassoulis, 1989; Innes, 1996; Ostrom, 2007; Sabatier and Weible, 2007).

Inside the Hourglass three dimensions are analyzed that are closely linked to negotiating consent (see Supplementary Material for a more detailed discussion of the three dimensions):

1. *Actor coalitions* are defined as groups of individuals and organizations that unite in a planning process since they have a shared interest. The formation and change in actor coalitions is a measure of the degree of consent across actors and actor coalitions on the strategic delta plan and its implementation. An analysis into actor coalitions captures the dynamics between actors in supporting, rejecting, shaping and negotiating proposed plans and strategies. Since actors are usually involved in delta management for many decades, they may need new frames and perspectives to negotiate consent.
2. *Innovative solutions* are defined as solutions that entail a new product, idea or way of doing something in delta planning and management. It may also refer to the novel application of a solution in a particular region, or the (re)-introduction of more traditional solutions such as bringing back floods or floating rice. Innovative solutions may support consent among actors and across actor coalitions when they are multi-functional and thus attractive to a variety of actors and sectors. Therefore, innovative solutions could contribute to consent as interests of actor (coalitions) are accommodated differently when compared to conventional delta solutions. Innovative solutions may have been proposed years before a strategic delta planning process is started.

*Participatory planning tools* are defined as tools and approaches that enable a variety of actors to participate in the planning process. Given the wicked challenges of sustainable delta

development, participatory planning tools may facilitate discussions and social learning between actors and support consent negotiations as actors can see, discuss and shape the different pieces of a strategic delta plan.



Subscript Figure 1: The Hourglass analytical framework to analyse a strategic delta planning process. The dotted lines of the Hourglass reflect the porous boundary of strategic delta planning with the wider context of politics, institutions and prevailing cultures. The framework builds on four major assumptions. I Convergence and divergence on long-term delta development strategies is expected to occur from agenda setting to plan formulation and implementation. II The convergence-divergence is a consequence of negotiating consent for the strategic delta plan. Actors, issues and strategies may be excluded due to political and time pressures, Divergence is expected to occur to negotiate regional consent. Since the setting changes from delta to (sub)regional scales, local interests and perspectives have to merge with the developed plan for implementation. III: Over time (typically more than 10 years), actors and innovative solutions may trickle down in the Hourglass. The numbered arrows represent different trajectories for actors and negotiated consent: (1) step forward, consent strengthens; (2) step out, consent weakens (3) step in, consent strengthens, (4) sidestep, consent initially weakens and may be strengthened in implementation. IV: Actors and innovations may change in constellation over time, but for implementation within

strategic priorities of the developed plan, Participatory planning tools may support participation and social learning during the formulation of a strategic delta plan and its subsequent implementation projects.

### 2.3.1 Actor coalitions

Actor coalitions are frequently studied in the policy sciences (Kingdon, 1984; Kickert and Koppenjan, 1997; Ostrom, 2007; Sabatier, 2007; Van Tatenhove et al., 2000). The term actor refers to individuals, or groups of individuals that act in a coordinated way and engage in a (policy) process. A broad range of actors is involved in strategic delta planning processes. Policy makers from governmental organizations of different levels contribute to the development and implementation of policies (Vink et al., 2013). Politicians and high-level individuals might be the ones initiating a strategic delta planning process and they are vital in securing funding and political support (Verduijn et al., 2012). Societal stakeholders, both profit and non-profit, participate to try to have their interests accommodated in the planning process. Special interest groups (cf. human rights, industry, tourism, nature,) lobby for their interests when the strategic delta plan is formulated. Local residents may become involved when local strategies are designed and implemented. Experts, such as engineers, researchers and planners, attempt to make the existing knowledge usable for decision-making on the complex issues of delta development (Boezeman et al., 2013). Lastly, the media are an important actor both in communicating messages of key policy makers and the concerns of critics (Vink et al., 2013). Each actor has potentially different values, interests or perceptions of the situation and policy preferences.

Different actor coalitions may exist. Actors may share resources, rules (Van Tatenhove et al., 2000), discourses (Hajer, 1995) and beliefs (Sabatier and Weible, 2007). Furthermore, they may be homogeneous or heterogeneous (Adam and Kriesi, 2007). Next to studying actor dynamics at a macro level, actor dynamics could be studied at the micro level, to better understand how particular actors perceive opportunities to change in a strategic setting. The flexibility of actors to maneuver, and therewith strengthen or weaken a consent, is amongst others influenced by MOTA factors: the MOtivation to act, perceived Threats and opportunities and the Ability to act (Phi et al., 2015).

### 2.3.2 Innovative solutions

An innovation is the introduction of new products, ideas or ways of doing something. It can be radical or incremental, and it can be applied to products, processes and services. It may also mean that a technology or idea is new in a particular region as it has not been practiced before, or only a very long time ago and now receive renewed attention<sup>3</sup>. The field of science and technology studies asserts that technology and innovations are socially constructed (Bijker, 2010; Geels and Schot, 2007; Latour, 2005; Pinch and Bijker, 1984). As a result, different actor groups may have different interpretations of an innovative solution or ‘artifact’. One innovative solution may become more dominant than another within a specific technological frame (Bijker, 2010). Due to their role in innovation processes, the innovations or non-human artifacts become an actor too (Latour, 2005).

In strategic delta planning innovations could focus on technological solutions, funding, legislation, regulations and institutions. We focus on technological solutions in strategic delta planning as they may be required to enable change for sustainable development in urbanizing deltas. In many deltas traditional solutions have moved deltas into unwanted trajectories<sup>4</sup>. In deltas, promising innovations are related to concepts that can serve multiple purposes, since deltas are characterized by competing land use claims, e.g. for agriculture, industry, and housing. They can introduce a new angle on problems and solutions as they integrate different realms (and actors and sectors). For example the ‘room for the river’ concept combines flood control measures with spatial planning (Van Stokkom et al., 2005) and the ‘living with floods’ approach combines floods with sustainable livelihoods (Nguyen and James, 2013). These innovations become consent builders when many actors can identify themselves with the central notions of these concepts. Hence, the innovations can unite various actors (coalitions). An innovation may become ‘dominant’ over other solutions or strategies when it is adopted or advocated by one or more actor coalitions until implementation. The innovative solution should thus be subject to varying appreciations of

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<sup>3</sup> In the upper Mekong delta, farmers have been experimenting with the traditional technique of floating rice. Floating rice is considered to be more sustainable than intensive triple rice. Intensive triple rice has contributed to agro-chemical pollution, reduced soil fertility and wild fish harvest.

<sup>4</sup> Worldwide, conventional, hard coastal engineering measures such as seawalls and dikes may be the ultimate solution to combat flood risks, yet they are costly and may fail as in New Orleans, and, they hinder natural processes of deltas to keep up with relative sea level rise (Temmerman et al., 2013).

actors and adaptable to re-interpretations and re-negotiations between actors until the solution is accepted, implemented and practiced.

### 2.3.3 Participatory planning tools

Participatory planning is premised on a pluralistic view of reality and voluntary participation of interested actors. All efforts are directed to finding a common ground across actors for solutions that can solve the environmental problems (Briassoulis, 1989; Innes, 1996). In our framework, the dimension of participatory planning tools differs from actor coalitions and innovative solutions as it is focused on particular parts of the strategic delta planning process wherein tools are offered and applied to facilitate participation.

In the field of environmental planning and policy, participatory tools are frequently promoted (Cools et al., 2013; Geertman and Stillwell, 2004; Geurts and Joldersma, 2001; Pahl-Wostl, 2005). Participatory tools can enhance knowledge and participation of actors in the planning process. Tools can have diverse outlooks, ranging from collaborative sketch planning to geo-information systems, scenario development, mental model maps, gaming and simulation (Beach and Clark, 2015; Geertman and Stillwell, 2004; Mathevet et al., 2011; Pahl-Wostl, 2005). Although participatory tools can count on many positive experiences (e.g. Beach and Clark, 2015; Goosen et al., 2014) there are also many bottlenecks in the use of participatory planning tools: potential users may have little motivation to use them (Vonk et al., 2005), results may be disappointing as tools may not be adopted by participants (Walker, 2002), and neither can or will everybody participate due to strategic or practical concerns.

In the setting of a strategic delta planning process, participatory tools should contribute to the structuring of the wicked problem of delta development; for instance by making the uncertain future explicit in various scenarios and by converging actor perspectives on what the strategic choices are. Tools benefit from a skilled facilitator to operate the tool and facilitate dialogue between participants. The dialogue may clarify different viewpoints of actors and result in an improved mutual understanding. Tools could emphasize the major characteristics and the implications of strategic choices for future developments to the participants. They can therefore enhance social learning (Ison et al., 2007) since discussions between participants could contribute to a setting where participants learn from each other. In addition, tools can facilitate discussions among participants on the implications of innovative and conventional solutions in the spatial environment since the solutions can be linked to geo-based maps.

Participatory tools can support consent creation when their application results in converging perspectives of the participants. However, they may also have a counterproductive effect when their application reinforces existing power relations or favors one type of knowledge over the other.

## **2.4 Method for exploring the validity of the Hourglass framework**

Different types of case study research exist. In this paper we present a ‘plausibility probe’ case study of the Hourglass framework. A plausibility probe is a preliminary case study that aims to explore the validity of a relatively untested analytical framework (George and Bennet, 2005). In addition, plausibility probe case studies can uncover new hypotheses (idem). To ensure a firm plausibility probe, we have selected the deltas of Bangladesh, the Netherlands and Vietnam, since strategic delta planning processes in these countries are initiated under very different social-physical conditions in terms of the political system, country income, population and total river flow (see Table 2). These different settings provide a strong test for the usefulness of the Hourglass framework in analyzing strategic delta planning and implementation.

(Table 2 may be inserted about here)

The case analyses were created with the input of a three-day workshop in May 2015. During the workshop 13 participants from Bangladesh, the Netherlands and Vietnam applied the Hourglass framework to the three deltas. The participants were invited due to their expertise in strategic delta planning and their role of researcher or advisor in the Strategic Delta Planning Project (see Annex A for an overview of workshop participants). Presentations were given on the three deltas to get a better understanding of the deltas and the specifics of the strategic delta planning processes. For instance in the Netherlands a balance is sought between leading the way and leaving room to cope with future uncertainties. In Vietnam the Mekong Delta Plan does not fit the planning system as there is no clear budget and timeline.

Plenary discussions were held on where to place the different cases in the Hourglass: Bangladesh and Vietnam were characterized in the plan formulation stage whereas the Netherlands was regarded to be in the implementation phase. Institutional changes may be required in each country to move a strategic delta plan into implementation. Sub-groups were formed to discuss dynamics in- and outside the Hourglass for each case. For instance that it is interesting to explore which actors bypass the strategic delta plan or operate informally

through backchannels, and how local planning merges with strategic plans in the implementation phase.

Overall, the workshop taught the participants that the Hourglass was a useful framework to discuss all sorts of dynamics involved in strategic delta planning (socio-political, short-term long-term, national – regional level, strategic and conventional planning). The workshop discussions served as first input for the case analyses presented in this paper. The case analyses were revised during subsequent rounds of writing and analysis. In addition, case analyses were validated with planning documents and embedded in scientific literature.

### **3 Plausibility probes of strategic delta planning in Bangladesh, the Netherlands and Vietnam**

The Sect. 3.1-3.3 discuss the three cases of strategic delta planning. Figure 2 provides a graphical overview of the three deltas. The case analyses provide insight in the planning processes up to September 2015.

(Figure 2 may be inserted about here)

#### **3.1 Strategic delta planning in Bangladesh – Bangladesh delta plan 2100 (BDP)**

Bangladesh is a rapidly developing country that is coping with a population growth of 2 million persons per year. The delta is prone to food insecurity and is frequently confronted with natural hazards (floods, cyclones, river bank erosion, droughts) and intensive abstraction of groundwater (Shamsudduha et al., 2009). The strategic delta planning process is initiated to improve the living conditions of the people of Bangladesh through appropriate water management and governance (Choudhury et al., 2012). An integrated and holistic vision is necessary to optimize short-term solutions and to prepare for future change (BanDuDeltas, 2014). The BDP is linked to the country's overall policy goals of becoming a middle income nation by 2021 and a developed country by 2041. Conventional planning in Bangladesh is done through 5-year planning cycles. Output of the BDP should be building blocks in successive 5 Year Plans of the Planning Commission.

##### *Hourglass*

The agenda setting phase ran from 2011 to 2014. Driven by a Dutch development aid agenda on water and deltas, the government of Bangladesh requested support from the Dutch

government for advice on a Bangladesh delta plan. During 2011-2012 a BDP preparatory team of Bangladeshi and Dutch experts explored the demands and commitment for a BDP. They also described contours of the plan (Choudhury et al., 2012).

The strategic delta plan formulation phase started in 2014, when a contract was signed between the Bangladeshi-Dutch consortium 'BanDuDeltas' and the Dutch Embassy in Dhaka. The Inception Report and baseline studies set the scene and highlight the knowledge gaps. The delta plan is expected to be formulated by September 2016 (BanDuDeltas, 2014). The plan as it is currently developed has a wide scope covering 19 thematic areas, ranging from water resources to urbanization, fisheries, institutions and knowledge management. To structure these themes regional hotspots are defined that focus on six regions: the coastal zone, the drought-prone area, the major rivers and estuaries, urban areas, wetlands in the east, and the hilly area in the southeast. Scenarios are developed to highlight potential future circumstances in Bangladesh, distinguishing between water conditions (extreme or moderate) and economy (diversified or traditional).

Bangladesh knows the challenge of implementing plans due to limited resources. The Government tries to secure funding through the World Bank and public private collaboration by signing an agreement in June 2015. To foster implementation, actors in the BDP focus on legislation, regulatory instruments and funding matters before the plan is fully developed. A new Delta Act is promoted (BanDuDeltas, 2014) that could be merged with the Water Act (2013). The implementation of previous master plans such as the Flood Action Plan (1989) and the Dhaka Metropolitan Area Development Plan (1995) suggest a problematic boundary between actors operating at the national and local level, making it challenging to implement master plans at the local level.

A range of stakeholders is involved in the development of the plan. Political parties are involved to ensure that they are aware of the BDP and support it. Also, stakeholders are consulted at the community, regional and national level. To that end various participatory planning tools have been used. A prominent one is the Touchtable Atlas, an interactive surface computing platform that visualizes and integrates different maps (BanDuDeltas, 2014). It is used as an interactive infographic tool but also serves as a data portal for the maps that are prepared for the BDP. Multiple design workshops are held in each hotspot region, thereby providing means for wide (regional) stakeholder involvement. Local knowledge was gathered in the design workshops. Furthermore, participants became informed, and began to

think and discuss within the scope and long-term planning horizon of the BDP. The workshops therefore enhanced support for the BDP process. During workshops with government officials and water experts, scenarios were interactively developed. The scenarios helped the participants to think about the (long-term) future and initial strategies in different scenarios.

Several innovative solutions are discussed, amongst others climate proofing the low-lying polder areas in the southwest coastal zone that are confronted with problems of land subsidence, water logging and flood risks. The concept of tidal river management entails that polder embankments are systematically breached to facilitate sediment delivery and elevation recovery (Auerbach et al., 2015), meanwhile supporting shrimp and rice cultivations. A different concept is that of total polder control, which optimizes water and land use management within a polder through subdivisions and designated areas for shrimp and rice cultivation. The first innovation is supported by environmental organizations, the agricultural sector and local leaders whereas the second innovation is supported by the ‘traditional’ water sector of the Bangladesh Water Development Board, regional water boards and contractors.

#### *Negotiating consent for the Bangladesh Delta Plan*

Several strategies were applied to come to consent for the BDP. The BDP team recognized they would need a broad and strong actor coalition to support and implement the BDP. It is not sufficient to develop the BDP in a water-centered coalition; usually the Water Resources Planning Organization coordinates water strategies and master plans. Instead, the BDP makes a deliberate effort to institutionalize its planning process in the mainstream planning and budget cycles of the Planning Commission; the country’s central planning development agency. As a result the BDP is now closely linked to the Planning Commission and delivers input to the successive 5 Year Plans of the Commission. Furthermore, the applications of participatory planning tools contributed to consent as they structured the thoughts and discussions of participants into the scope, planning horizon and scenarios of the BDP. The workshops therefore enhanced support for the BDP planning process at the national and regional level. Lastly, the innovative solutions highlight a challenge to be overcome, consent for the BDP is challenging as long as innovative solutions are not congruent and supported by competing actor coalitions.

### **3.2 Strategic delta planning in the Netherlands – from Delta Committee to Delta Programme**

The Netherlands is a low-lying flood prone country. After the disastrous floodings in 1953, the first Delta Committee recommended the ‘Delta Works’: a sectoral masterplan of major dams and barriers that nowadays protect the southwest of the Netherlands against flooding. In 2007 a new strategic delta planning process was initiated to avoid future (flood) disasters. The second Delta Committee explored how the Netherlands could be made climate proof for the very long-term (up to and beyond 2100), to ensure that the Dutch are safe against flooding, while remaining an attractive and livable place (Deltacommissie, 2008).

#### *Hourglass*

The agenda-setting phase took place before and during 2007, when the Dutch Cabinet installed the second Delta Committee. Different agendas were brought together in the mandate of the second Delta Committee. Whereas the Appointment Resolution emphasizes sea level rise and sustainable development of the Dutch coast, the Committee broadened its mandate by looking at flood control, fresh water supply, livability, agriculture, industry, nature and energy for the entire country (Deltacommissie, 2008). The Committee formulated the strategic delta plan in 2008 and presented in September an integrated vision that primarily addressed flood protection and sustainability. The integrated vision contained strategic choices in flood control (e.g. increasing flood protection levels with factor 10) and water management (e.g. increase the fresh water storage by raising the Lake IJsselmeer level 1.5 m). In addition, strategic administrative measures were proposed that would support implementation (i.e. Delta Programme, Delta Act, Delta Fund).

The implementation phase focuses particularly on flood control and water supply. This is emphasized by the scope of the Delta Act, Delta Programme and Delta Fund. The Delta Act stipulates: (1) a Delta Programme that is updated yearly, reporting on the implementation of strategies for flood control and water supply; (2) a Delta Fund of €1 billion per year for these strategies; and (3) a Delta Commissioner, who coordinates the Delta Programme and prepares the annual progress reports of the Delta Programme (Delta Commissioner, 2012). The administrative measures of the Committee’s strategic delta plan have been implemented. However, the Act, Programme and Fund represent a narrower focus (flood control and water supply) than the integrated vision of the Committee. This is also reflected in the Delta Fund since the majority is reserved for flood control whilst 5% is earmarked for measures of water

supply and water quality (Delta Commissioner, 2014). The scope of the programme was broadened in 2010 by adding spatial adaptation (urban and rural areas, critical infrastructure) after the need for spatial adaptation was stressed by the Ministry of Housing, Spatial Planning and the Environment (Ligtvoet and Van Minnen, 2009). However, no budget is earmarked in the Delta Fund for spatial adaptation measures.

The Delta Programme worked in nine sub-programmes that contributed to five Delta Decisions (a.o. standards for flood control, spatial adaptation and region-specific strategies for Lake IJsselmeer and the Rhine-Meuse delta). The 2015 Delta Programme translates the Delta Decisions into preferential strategies for the different sub-regions (Delta Commissioner, 2014). The preferential strategies developed by the Delta Programme have not yet been implemented. One strategy, that of new standards for flood risk management, is expected to come into force by 2017 (Delta Commissioner, 2014).

Stakeholder involvement during the Delta Committee was limited to ten plenary sessions, yet the Delta Commissioner had the clear task to build actor coalitions and many stakeholders were involved in joint fact finding processes (Verduijn et al., 2012; Werners et al., 2015). The participatory approach of the Delta Programme involved a large number of actors (national government, provinces, municipalities, water boards, private parties and NGO's). Design charrettes, collaborative sessions wherein designers and participants draft and draw solutions to (planning) problems, were applied in different sub-programs such as Lake IJsselmeer region, Coast and Southwest Delta. In these charrettes various spatial strategies were developed. Delta scenarios (developed over 2011-2012 with a 50 - 100 year time horizon) are used to assess the robustness of the Delta Decisions and the preferential strategies (Delta Commissioner, 2014).

The drastic and innovative measures of the second Delta Committee have been replaced in the planning documents with more modest, small-scale innovations such as breach-resistant dikes, multifunctional dikes and flexible water level management (Delta Commissioner, 2014). An innovation that may structurally change water availability is to reduce outflow of the river Rhine through the New Waterway, the main navigation link between the harbor of Rotterdam and the North Sea. Adjustments in the waterway could result in water savings that may then be used for other purposes. Another innovation that is considered is the introduction of salt tolerant crops that may resolve water shortages in the south-western delta and the Wadden Sea islands.

### *Negotiating consent for the Delta Committee and the Delta Programme*

The political consent for findings of the Delta Committee were strong: the findings were supported by the Parliament in 2008 and key political decisions were made by approving the Delta Act, Delta Fund and Delta Programme. Although the second Delta Committee formulated the strategic delta plan with an integrated vision on flood control and sustainable development, the implementation of the Delta Programme is more limited in scope, and the largest part of the budget in the Delta Fund is earmarked for flood control, which signals a continuation of past practices. This questions the strength of the consent among the various actors to the Delta Fund and Commissioner, and the room for manoeuvre that they were allowed where it comes to moving away from previous practices. Furthermore, in obtaining this consent, the drastic innovative measures of new flood protection norms and raising water levels for fresh water supply played an important role as they imposed a sense of urgency (Verduijn et al., 2012). During the implementation phase the innovations are no longer drastic, instead they are described in a generic way without specifying locations or requirements for implementation, to support consent at the national and regional level. Lastly, the participatory planning tools were frequently applied in the Delta Programme. A direct link between the planning tools and consent is in this probe difficult to observe, as many different tools were applied ranging from design charrettes, scenarios and joint fact finding processes.

### **3.3 Strategic delta planning Vietnam – Mekong Delta Plan (MDP)**

The Mekong Delta is vulnerable to climate change, especially regarding floods, droughts and salinity intrusion. The intensification of rice and shrimp farming has had severe consequences on water quality and fresh water supply. In addition, major developments of irrigation expansion and hydropower in upstream countries (Thailand, Cambodia, Lao PDR and China) are likely to further affect the Mekong hydrology (Cochrane et al., 2014). The combined effects of climate change (higher wet season rainfall and prolonged drought periods) and upstream developments indicate substantial increases in wet season flood levels, and potentially pronounced decreases in dry season minimal flows. Employment and migration is another issue in the delta, since the young and educated leave the region for jobs in cities as Ho Chi Minh City and Hanoi. For these reasons, a strategic delta planning process is initiated to respond to the consequences of climate change and to ensure sustainable socio-economic

development (Royal HaskoningDHV et al., 2013). The MDP was prepared under auspices of the deputy prime minister and under authorization of the Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Agriculture and Rural Development (MARD).

### *Hourglass*

The agenda-setting phase took place between 2009 and 2011. Dutch political actors had been advocating a strategic delta planning process in Vietnam. As a result, in 2010 the Vietnamese Government requested the Dutch Government for assistance in developing a MDP analogue to the Dutch Delta Committee. The same year a strategic partnership was signed and 8 sector studies were conducted by Vietnamese Institutes and Dutch partners to come to a more precise formulation of problems, trends and opportunities in the delta (Deltares et.al., 2011). The strategic delta planning phase ran from 2011 to 2013. The MDP team consisted of Dutch and Vietnamese members. The plan was completed in December 2013. It proposes four scenarios that highlight distinct potential socio-economic developments such as industrialization, food production and agro-business. For the three regions (upper-middle-coastal) specific measures are discussed ranging from abandoning the triple rice policy to installing urban flood safety and brackish (poly)aquaculture systems. The MDP was approved in June 2014 by both prime ministers. The MDP provides a new strategic policy guidance framework for new ministerial policies and master plans of the Vietnamese line ministries. As attested in the Mekong Delta Forum of February 2015, the MDP is embraced by Vietnamese line ministries and the Donor Support Group as the strategic framework for future policy setting and development of the Mekong Delta. Funding is in part secured since the World Bank stated it will use the MDP to assess the feasibility of proposed projects that will be funded by a proposed 300 million USD loan.

The cooperation between ministries and provinces is challenging in Vietnam. Yet cooperation for implementation is needed given the interplay between strategic choices in the different regions of the delta. Some first changes in planning styles have been seen as the Vietnamese begin to realize the enormity of the challenges implementing the MDP. At the Mekong Delta Forum, one Vietnamese stakeholder suggested that a Delta Law may be needed to anchor and implement the integrated vision as independently operating ministries are unable to address this complex challenge. Also stakeholders begin to talk in terms of trade-offs between options

instead of seeing planning as a wish list of measures for which one governmental organization is responsible.

The most powerful actors are the ministries in Hanoi and the provincial authorities in the delta – both governed by the Communist party structure. Furthermore, at the policy level important actors are the international donor support group and international environmental organizations such as IUCN. National and regional experts participate in focal groups. The line ministries and their institutes are now actively engaged, together with an international donor support group, in elaborating policy and development plans that support the strategic framework and choices of the MDP. A powerful ministry that was less involved in the MDP is the Ministry of Planning and Investment, responsible for strategic advice on social-economic development.

Participatory planning tools have been applied lightly and were mainly focused around charrettes and public consultations in a four-tier system: (1) with line ministries and public administrators, through the Strategic Office in Hanoi, and a tailor-made policy and master planning review; (2) with the Governors and Administrators of the Mekong Delta provinces in two dedicated MDP sessions of the yearly meetings of the Mekong Delta Economic Development Committee (MDEC) of the Party's South-West Steering Committee; (3) a series of dedicated focal group discussions with experts (policy makers, administrators, and academic experts from national and regional institutes); (4) a series of MPD dedicated provincial public consultation sessions with provincial and district administrators and key stakeholders from sectors and NGOs.

The MDP proposes innovative solutions such as reconsidering the triple rice policy and a major flood diversion. Regarding the triple rice policy, the MDP served as a platform to discuss this drastic measure publicly for the first time ever in Vietnam, as a means of providing adaptive land use planning to flood management as well as sustainable economic development. In the coastal zones, the innovations center around the active embracing of salinity intrusion, and the adaptation of coastal defense and land use systems to a brackish economy of poly-culture aquaculture and coastal mangroves.

#### *Negotiating consent for the MDP*

The actor coalition that gave its consent to the MDP appears to be strong as powerful ministries, international NGOs and financial donors have embraced the MDP as a framework

for future developments in the Mekong Delta. To come to this consent, the charrettes and public consultations sessions served to elaborate consent among a wide range of stakeholders on the strategic policy analysis of the MDP. During the consultations it became also clear that there is strong preference among stakeholders towards the agro-business industrialization scenario as a strategic choice for a delta tailored socio-economic development. This scenario marked a distinct change in development with regard to rice policies that have dominated the last decades of developments in the delta. The development and application of the scenarios thus contributed to consent and convergence in how people thought about long-term developments in the delta. The innovative multi-use solutions had a central role in making the scenarios realistic. They were specific enough to serve as strong images for alternative developments in the delta, yet they are also described without specifying locations or technical details to promote consent in the Mekong Delta and at the national level.

### **3.4 Lessons of the plausibility probe for the Hourglass framework**

The plausibility probe showed that all the elements of the Hourglass framework are clearly discernible in very different deltas. The probed cases enrich the Hourglass framework in two ways as insights are obtained on the negotiating consent and the decision-making phases.

First, the probe shows how a focus on the key dimensions in the hourglass framework (actors, tools, innovations), helps to describe and understand how consent is negotiated in a strategic delta planning process. Furthermore, the probe suggests a further sharpening of the framework regarding actor coalitions, suggesting that two types of actor coalitions can be identified in strategic delta planning. One type is the ideological or advocacy coalition, where actors unite around their belief systems or core values (Sabatier and Weible, 2007). The other type is the ‘pragmatic coalition’ where actors unite as they realize that they can accommodate their different interests by forming a more opportunistic, or ‘strategically rational’ coalition; A coalition as the most efficient way to realize strategic objectives. Consent in a pragmatic coalition may be less long-lasting than in an advocacy coalition, as (pragmatic) actors will leave the pragmatic coalition if they think that is the best way to pursue their own interests in a new decision-making round. The Dutch case exemplifies the role of pragmatic actor coalitions. Although the second Delta Committee formulated the strategic delta plan with an integrated vision on flood control and sustainable development, the eventual implementation of the vision, through Delta Act, Fund and Commissioner saw a renegotiation of some of the

most far-reaching suggestions. This may imply that the ministry formed a pragmatic coalition with the second Delta Committee, giving consent to the establishment of a new Delta Fund and Commissioner as an institutional innovative approach to pursue its long-lasting and traditional agenda of flood control.

In terms of innovative solutions, the Dutch and Vietnamese case illustrate that radical solutions can be introduced within a strategic delta planning process due to the long-term strategic planning scope. The Mekong Delta Plan is the first planning document in Vietnam that questions the triple rice policy. The policy was initiated to promote food security for Vietnam. Its sustainability is questioned since the associated high dike systems increase flooding downstream and the intensive use of fertilizers and pesticides degrades soils and ecosystems. Questioning the 'status quo' creates space to introduce multipurpose innovative solutions such as poly-aquaculture systems that contribute to regenerating mangrove forests. To promote consent on regional and national levels, the innovative solutions in the Dutch and Vietnamese delta plans are described in a generic way without specifying locations or requirements for implementation. The embeddedness of the Vietnamese delta plan in a perspective of economic development and outlook, in which the cultivation of (triple) rice is no longer deemed as economic competitive with the mean of the middle income national economy, is hereby instrumental and characteristic of the wickedness of the problem and the holisticity of the approach.

With respect to participatory planning tools, the probe reveals that a variety of existing tools and approaches are applied to strategic delta planning processes, resulting in delta scenarios, delta design charrettes, and interactive infographic tools. The relation between tools and consent for long term delta development is exemplified in Vietnam, as the development and application of scenarios resulted in convergence for strategic decision making. Although in Bangladesh the plan is still under development, the probe suggests that the participatory planning tools are instrumental in making a range of actors familiar with the scope and difficulties of strategic delta planning. To what extent the use of these tools, and the effectiveness of their application, can be linked to strength of the consent in planning reached, remains a subject of further study that needs to be traced over the different stages of planning.

Second, the probe has produced new insights regarding the shape of the Hourglass. The probe confirms that the three phases of strategic delta planning can be clearly identified in the

studied cases. Bangladesh is in the early phase of the actual strategic delta plan formulation, whereas Vietnam has completed the MDP. The Netherlands is furthest in terms of the Hourglass framework as funding and legislation is adjusted to promote implementation. The cases contain examples of different trajectories in the Hourglass (illustrated in Fig. 1). The Planning Commission of Bangladesh seems to ‘step in’ therewith strengthening the consent. In the Netherlands the Ministry of Infrastructure and the Environment is ‘stepping forward’ whereas spatial adaptation actors did not manage to ‘step in’. In Vietnam the Ministry of Planning and Investment has been involved less, signaling either a ‘step out’ or a ‘side step’.

All three cases converge from agenda setting to the formulated strategic delta plan – not in the least because political actors and actions need to converge on a moment of decision. Nonetheless, the hypothesized divergence from strategic delta plan to implementation is less clear. The Dutch and Vietnamese case study hint that multiple steps may be needed to move from strategic delta plan formulation to implementation projects. Adjustments in funding and legislation are relevant to embed the planning process in a wider institutional context; apparently this embedment and broadening of the consent is needed before a strategic delta plan can get implemented. Consequently, a strategic delta planning process consists of numerous decision-making rounds wherein the strength of the consent can be (re)-analyzed. For instance in the Dutch case, consent for the content of the first strategic delta plan may have been weak since five extra years were needed to discuss strategic options and strategies, eventually resulting in five Delta decisions and preferential strategies.

#### **4 Discussion**

We started this paper by positing that strategic delta planning is a novel planning approach when compared to conventional delta planning. Consent offers a useful concept to analyze the influence of strategic delta planning processes on guiding delta developments congruently towards sustainable delta development. The Hourglass framework (Sect. 2.2) was developed to analyze how actors, innovative solutions and participatory planning tools contribute to consent for long term sustainable delta development. The validity of the framework was tested through a plausibility probe. The probe has contributed in three ways to a better understanding of strategic delta planning processes.

First, the probe showed that the Hourglass framework explains how a process of strategic delta planning evolves by focusing on actor coalitions, innovative solutions and participatory planning tools in negotiating consent. The probe showed that new actor coalitions are formed

to enhance consent for a strategic delta plan. Towards implementation, actors and strategies may step forward, step in, out or sidestep a strategic delta plan. Different types of actor coalitions may exist (pragmatic and ideological) that have different motivations in giving consent to decisions and plans (Phi et al., 2015). The probe revealed that traditional solutions like protecting polders or triple rice productions are no longer self-evident in negotiating consent in urbanizing deltas. Different technological innovations may emerge in the planning processes (Bijker, 2010), ranging from radical or extreme solutions to abstract and multipurpose solutions. The first may provide urgency and rationale for a strategic delta planning process whereas the latter two are likely to support consent as they are attractive to multiple actors. The probe indicated that participatory planning tools are instruments in negotiating consent. Design workshops help to change the appreciations of participants from conventional to strategic delta planning and developing scenarios can result in convergence on preferred delta developments.

Second, the probe demonstrated that the Hourglass framework analyses shed light on the outcomes of strategic delta planning in terms of consent in decision-making. Decision-making takes place in rounds (Teisman, 2002) of agenda setting, strategic delta plan formulation and implementation. During these rounds, consent is needed due to political decision making on a strategic delta plan, funding and legislation. In between the rounds, the Hourglass analyses can indicate whether the consent is strong and lasting, and whether convergence or divergence takes place between these rounds regarding advocated strategies for long term delta development. The Hourglass framework can thus provide analyses on the stability of the consent across decision-making rounds.

The hourglass distinguishes three phases – each of which are different in their political nature, and by implication stakeholder alliances; the framework implies that for each stage specific tools and consent negotiation/confirmation processes are needed. These still stand to be confirmed. The innovativeness of solutions, likewise, still have to stand the test of time and how they may be structuring of consent while dynamic in their design and development as they pass through different stages of planning, design and implementation, as well as embraced and probed by different stakeholders and alliances.

Third, the framework was probed in widely differing deltas in northern and southern parts of the world. Despite the differences in planning styles, social-economic and cultural contexts, the cases revealed that the Hourglass framework can be successfully applied to analyze the

process and outcomes of strategic delta planning processes. The Hourglass framework highlights the dynamism of strategic delta planning processes. Strategic delta planning and development is a dis-continuous process of political strategic decisions, bureaucratic planning, technocratic design and societal alterations to implementation. The strategic delta plan and its implementation need to encompass this, *not only across timescales (long term - short term), but also across spatial scales, to make a congruent plan wherein problems and interests of regions are met in a political influenced planning process.*<sup>5</sup>. The Hourglass framework is suitable to analyze strategic delta planning initiatives in delta regions worldwide, analyzing the strength and stability of consent for strategies leading to sustainable delta development. Furthermore, the framework contributes to strategic spatial planning literature as it introduces through consent negotiations a novel conceptual lense to explore the impact of strategic spatial planning and implementation (Albrechts, 2004; Bafarasat, 2014; Faludi, 2000; Healey, 2004). It may therefore be also relevant for master plans in relation to urban and spatial planning, climate adaptation, integrated water resources management, seas and oceans.

Due to the above it can be concluded that the Hourglass framework is potentially a useful contribution to better understand the processes and outcomes of strategic delta planning processes worldwide. The dimensions of actor coalitions, innovative solutions and participatory planning tools provide useful analytical dimensions to explore how consent is negotiated. However, as the probe has produced brief and selective case analyses there are also some limitations. Consent was mainly interpreted as who is supporting the plan, yet this did not describe specifically which interests were accommodated so that actions could be taken (Checkland, 2000) or which topics and people were excluded (Connelly and Richardson, 2004). In addition, it was difficult to determine the stability of the consent (over time and in multiple decision-making rounds) to gain more insight on how influential strategic delta plans truly are in influencing the scope of (implantation) projects in the delta. Other limitations of the probe are that it could not be determined how strategic the plans are (Albrechts and Balducci, 2013), their contribution to sustainable delta development, or in

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<sup>5</sup> The following two hypothetical examples illustrate this point. When in a delta upstream regions would raise their river embankments, floodings may increasingly occur downstream. When one region switches to brackish agri- or aquaculture, surrounding regions may have to switch as well.

which decision-making context (e.g. power relations, democratic representation) strategic delta planning works best (Healey, 2009). These valuable questions remain to be explored.

## **5 Conclusion and further research**

### **5.1 Conclusion**

Strategic delta planning processes set off from high ambitions since they aim for sustainable delta development. This calls for tremendous efforts, because it requires a move away from vested interests, conventional planning paradigms and technologies. This paper has introduced the Hourglass framework to better understand how consent for the strategic delta plan and implantation is developed by focusing on actors, innovative solutions and participatory planning tools. The usefulness of the framework was explored through a plausibility probe with cases of Bangladesh, the Netherlands and Vietnam. The cases demonstrated that Hourglass framework is potentially a valid and useful framework to analyze the process and outcomes of strategic delta planning in deltas around the world. Furthermore, the probe highlighted how consent is negotiated through pragmatic actor coalitions, generically described multipurpose solutions and planning tools to shape the appreciations of stakeholders towards sustainable long-term developments in the delta.. Having established the validity of the framework, we end the paper with areas for further research wherein the Hourglass framework is the analytical point of departure.

### **5.2 An initial strategic delta planning research agenda**

Further empirical research may lead to insights for strengthening consent in strategic delta planning processes through informed actor coalitions, implemented innovations and effective participatory planning tools. The proposed research agenda (Table 3) covers 6 working hypotheses that are derived from literature and the probe with the Hourglass framework. The hypotheses 1-3 address the nature and success of strategic delta planning hypotheses and hypotheses 4-6 cover important aspects to negotiate consent for long term sustainable delta development.

(Table 3 may be inserted about here)

### **5.3 Further development of the research agenda**

Strategic delta planning processes cannot be studied in isolation as their context (social, economical, political, physical, ecological) and other planning processes influence strategic delta planning. Researchers should acknowledge the influence of different stakeholders, political decision-making, social-economic concerns and technological developments on a planning process. Therefore, to get a better inside perspective it is essential that researchers engage and collaborate with practitioners in the delta planning community. Such transdisciplinary science (Pohl, 2005) or knowledge co-production (Cornell et al., 2013), is also promoted in multidisciplinary delta research projects such as Belmont Forum Deltas and ESPA project (Brondizio et al., 2016; Nicholls et al., 2015).

We have already experienced that such collaboration contributes to more insight in the role of actors in planning processes, the strengths and weaknesses of participatory planning tools and promising innovative solutions for sustainable delta development. Also, by involving practitioners, a better connection is ensured with on-going decision making and delta planning processes. Lastly, by involving experts from different deltas, a more comprehensive understanding arises on the diversity in (planning) culture and governance. This generates a better understanding on how to transfer knowledge, planning approaches and innovative solutions from one delta to another.

To conclude, we commit to work on the proposed initial research agenda. We invite others to contribute to this initial research agenda hoping that it will stimulate further research and discussions amongst researchers and practitioners in the delta planning community. Ultimately such research should lead to a better understanding of strategic delta planning process, and what makes them effective in establishing a strong and stable consent that guides innovations and developments from strategic policy, planning and design, to implementation.

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## Annex A Data collection on strategic delta planning

Strategic delta planning expertise of the experts who participated in the 3-day workshop, 18-20 May 2015.

Organization	Strategic delta planning expertise
CEGIS (Center for Environmental and Geographic Information Services)	Bangladesh Delta Plan
Deltares <sup>†</sup>	Bangladesh Delta Plan
Staff of the Delta Commissioner	Dutch Delta Programme
Dutch Planning Assessment Agency (PBL)	Dutch Delta Programme
Technical University Delft	Dutch Delta Programme
Wageningen University	Mekong Delta Plan
IUCN Vietnam (International Union for the Conservation of Nature)	Mekong Delta Plan
WACC Center (Water Management and Climate Change)	Mekong Delta Plan
UNESCO-IHE	Myanmar IWRM Strategic Study
BoschSlabbers Landscape + Urban Design	Netherlands (Dutch Delta Programme, Dutch Southwest Delta), USA, Vietnam, Australia

<sup>†</sup>Could not attend the 3-day workshop, but shared experiences before and after the workshop.

Professionals who were interviewed during the field-visit to the Dutch southwest delta, 19 May 2015.

Organization	Strategic delta planning expertise
Port of Rotterdam Authority	Dutch southwest delta
Province of Zeeland	Dutch southwest delta
Rijkswaterstaat	Dutch southwest delta