Evaluation of the Draft Environmental Impact Assessment (EIA) for the Proposed Reclamation of Seri Tanjung Pinang (Phase II) Development (STP2), Penang

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March 2014

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The DEIA for the STP2 underestimates and undervalues the project's impact on fisheries while overstating the likelihood that such impacts could be mitigated

If the Seri Tanjung Pinang (Phase II) Development (STP2) were approved, several fishing communities, including the fishing communities of the Gurney-Paramount, Tanjung Tokong and Tanjung Bungah areas would suffer as a result of the project.

Page 9-16 of the DEIA describes the healthy productivity of the existing fishery:

> "The northern part of Penang Island coastal waters is generally characterized by very turbid conditions during low or even at high tides. As part of the northern end of the Malacca Straits, the high turbidity was largely influenced by high sedimentation and large organic inputs from mangrove vegetation of both Malaysia and Sumatera Island in Indonesia. <u>This area was identified as a productive and important fishing ground for local fishermen</u>. Fishing activities in this area comprise relatively modern fishing ventures, traditional coastal fishing, and recreational and sport fishing. There are also a large number of mariculture activities such as fish cage culture and cockle rearing that are mostly located near the mainland of Peninsular Malaysia.
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> "Beside fish itself, the fisheries component also includes other commercial marine animals such as crustaceans (shrimps, crabs and lobsters) and molluscs (squids and bivalves). <u>Majority of these invertebrates live in benthic environment and play an important role as food source for commercially valuable demersal fishes</u>."

Page 9-21 acknowledges the local fisherman dependent on this productive fishery:

> "It is important to note that most of the artisanal fishermen operate their fishing operation in close vicinity of the nearshore areas that include the proposed project area. The main fishing gears deployed are the monofilament gill netting and trammel nets. These nets are mainly used to catch the pelagic fish species such as the scombrids and carangids, Indian Mackerel (Ikan Kembung, Rastrelliger spp.), Selar and Caranx spp. The pelagic fish species seek their food in the water column following the dominant tidal current. On the other hand, demersal fish species such as crockers and sea catfish relied on the specific feeding ground at the sea bottom, such as the muddy sea bed areas inhabited and colonized by abundant infauna such as polychaete and bivalves species."

The DEIA discusses the numerous ways the STP2 would impact fisheries, including impacts from the release of sediment during dredging, and the permanent smothering of mudflats and other benthic environments that support local fisheries.
With respect to impacts from dredging, page 11-18 of the DEIA states:

> "The **suspended solids from the dredging of the flushing channel** would seriously affect the fish resources in the surrounding waters, offshore STP1 and Tanjung Tokong waters. <u>These waters are important fishing ground to the fishermen of Tanjung Tokong, Paramount and Tanjung Bungah. This would cause an economic loss as their catch would</u>

be reduced and they may have to move to other fishing grounds further away such as Kuala Muda. Additional fuel cost and high fuel price would reduce their profit margin further. The overall size of this fishing ground would also be reduced."

With respect to impacts from the loss of mudflat and seafloor habitat because material would be laid on top of it, pages 13-3 to 13-6 of the DEIA state:

"Reclamation will result in permanent loss of the mudflat and seabed habitat. Mudflat provides habitat for some fishery resources like cockles, bivalves and gastropods/snails and shrimps. In addition, they also serve as source of nutrients for fish and birds. In this regards, an important life-support function of mudflats is the provision of habitats for birds. The muddy seabed serves as crustacean feeding ground and macrobenthos habitat.

"The loss of mudflat and seabed will result in some reduction in the amount of resources important to support marine life. *The total area to be affected is 328 ha consisting of 304 ha for the reclaimed island and 24 ha for the Gurney Drive component*.

"The seabed, in particular muddy seabed, serves as habitat for some fishery resources like cockles, bivalves and gastropods/snails and shrimps. In addition, they also serve as source of nutrients for fish. There is no current estimate on the value of environmental services offered by sandy and silty seabed. For the purpose of evaluation, mudflats (where estimates are available) is used as the basis of computation.

"Cockle production in mudflats has been estimated at USD 26,370,547 in 1995 for Peninsular Malaysia (Sassekumar et al. 1998). Kanagrajah (1984) reported that that the net revenue for cockle is 60% thus giving a net revenue of USD 15.8 mil. For bivalves, the price was estimated at USD 2,600 per tonne and the total bivalve production was valued at USD 17,639,960 (Sassekumar et al. 1998). Similar to cockle, the net revenue factor of 60% has been adopted by researchers. For gastropods/snails and shrimps, a price of USD 600 and USD 200 per tonne respectively had been estimated by Sassekumar et al. (1998). These prices result in corresponding gross revenue of USD 344,879 and USD 2.9 mil for gastropods and shrimps respectively and to be adjusted with a net return factor of 30%. The total production of fish and prawn for mudflats is estimated at USD 2.2 mil with a net return factor of about 25%."

"Total size of mudflats in Peninsular Malaysia is estimated at 35,064 ha. Using the above estimates on the annual production of cockles, bivalves, gastropods/snails, shrimps and fish and prawn, the estimated environmental service of mudflats in the form of direct use value (adjusted for price increase) is provided in Table 13.2."

In this study the direct use value for mudflat is estimated at RM ,890.93/ha/yr."

"The value of environmental services forgone from the disruption to the seabed habitat is obtained by multiplying the size of the affected area (328 ha) by the estimated value of environmental service produce by mudflat (i.e. RM 3,890.93/ha/yr)."

Therefore, the DEIA would estimate annual losses of environmental services forgone from the disruption to the seabed habitat at RM 1,275,920 ($390,000 USD) per year.

However, this inappropriately underestimates the "value of environmental services forgone from the disruption to the seabed habitat" in two ways. First, the total size of mudflats in Peninsular Malaysia should not have been used as a means of calculating the *per hectare value* of mudflats impacted by the STP2 project because not all of the mudflats in Peninsular Malaysia are fished, since many mudflats in Peninsular Malaysia are either inaccessible or extremely remote from human settlement. A calculation of the *per hectare value* of mudflats impacted by the STP2 project should have used the total area of mudflats in Peninsular Malaysia that are actually fished, resulting in a much lower area and hence **a much higher *per hectare value.***

More importantly, cockles, bivalves, snails, shrimps and prawns would not be the only species affected by disruption to the seabed habitat. As the DEIA correctly notes (at page 13-3), mudflat habitat "*also serve as source of nutrients for fish*" for a much larger area. Because the 328 hectares of mudflat habitat that would be lost because of the STP2 project serves as a source of nutrients for fish (consistent with the interlinking nature of food webs in the marine environment), other fish species would be affected as well.

As the DEIA correctly notes, the fishing communities of the Gurney-Paramount, Tanjung Tokong and Tanjung Bungah areas catch more than cockles, bivalves, snails, shrimps and prawns. According to page of the DEIA:

> "It is important to note that most of the artisanal fishermen operate their fishing operation in close vicinity of the nearshore areas that include the proposed project area. The main fishing gears deployed are the monofilament gill netting and trammel nets. These nets are mainly used to catch the pelagic fish species such as the scombrids and carangids, Indian Mackerel (Ikan Kembung, Rastrelliger spp.), Selar and Caranx spp. The pelagic fish species seek their food in the water column following the dominant tidal current. On the other hand, **demersal fish species such as crockers and sea catfish relied on the specific feeding ground at the sea bottom, such as the muddy sea bed areas inhabited and colonized by abundant infauna** such as polychaete and bivalves species."

Because the DEIA has not assessed how losing a vital component of an overall marine food chain – 328 hectares of mudflats – would impact pelagic and demersal fish species that the fishing communities of the Gurney-Paramount, Tanjung Tokong and Tanjung Bungah also rely upon, the DEIA substantially underestimates the impact of the STP2 project on fishing communities.

Page 11-73 of the DEIA states:

> "The proposed project site is within the subtidal and tidal range, thus material filling will result in total loss of the natural mudflat and coastal zone within the project area. Birds, fish and other pelagic marine life will be driven away. However, being highly mobile, the birds and fishes would seek new foraging grounds in the nearby intact mangrove and

> mudflats such as those of the Batu Kawan and Sungai Juru estuaries. The young mangroves that have been newly established on the mudflats will be lost due to reclamation and this is a tangible loss. However, new mangroves can be replanted in pockets of mud deposition along the newly created coastline.
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> "Loss of the existing sandy mudflats due to creation of the new islands is permanent and unmitigated. However a new coastline will be created. In due course, and the marine intertidal life will be re-established and the coastal birds (residents and migrants) will resume their feeding and foraging activities in the newly established coastline."

This assessment of how birds and fish will just easily go elsewhere because they can move shows a lack of understanding of both the natural history of the species and the conditions they rely on to feed and reproduce. The brief, dismissive description of mangrove restoration is also frustrating, as mangroves require very specific hydrological conditions and careful reestablishment techniques.[1] And the idea that over time marine life will just return to the way it was shows a real abdication of responsibility on the part of the project proponents. The flora and fauna survey, which is better than is often done (although there were no marine mammal or turtle surveys done, apparently), reveals a high level of biodiversity, including migratory birds that depend on the mudflats and mangroves for their survival en route.

The DEIA for the STP2 contains no financial assurances that mitigation measures would be implemented in the event the project is abandoned

The description of the STP2 project is grandiose. For example, page 5-23 of the DEIA touts these features of the project:

> b) Housing:
> i) An island of 8 districts consisting of neighbourhoods, creating a sustainable community for the full cross-section of Penang's society;
> ii) 12,000 new homes including starter-homes and apartments; and
> iii) Active mixed-use places throughout the island that integrate work places with homes alongside education, places of worship and leisure/cultural facilities.
> b) Place making:
> i) An island that will belong to all Penangites;
> ii) A festival island that provides civic spaces for public activities from dragon boat racing to food festivals;
> iii) Cultural public promenade ending with a landmark attraction;
> iv) International marina and yacht club; and
> v) Continued respect for the heritage of Penang island.

Grandiose coastal development projects are at risk of financial collapse if consumer demand for the project evaporates while developers are spending great sums to build project infrastructure. For example, in Spain:

> "<u>This paper examines the negative consequences and impacts generated by abandoned urbanisation processes which are leaving buildings (residential and tourist resorts) and infrastructure idle in different stretches of the Spanish coasts</u>. To identify negative

[1] Lewis, R.R., III. 2005. Ecological engineering for successful management and restoration of mangrove forests. Ecological Engineering 24: 403-418.

> impacts of abandoned buildings a compilation of cases study from 70´s and present are presented, in conjunction with a study on the evolution of the legal framework surrounding land policies in Spain from the 1940´s. Two kind of impacts were identified: those of socio-economic nature (i.e. loss of jobs, loss of value of the area, marginalization of population and transfer of cost between private and public sector) and those of environmental nature (i.e. visual impact, landscape modification, erosion, loss of biodiversity and pollution). Finally, a comparison is made based on the current situation with similar cases occurred during the 70's, with special regard to the evolution of Land Laws. The analysis shows that Spanish Law has evolved positively in terms of social responsibility; nevertheless, environmental responsibility does not yet cover these cases satisfactorily."[2]

Abandonment of coastal construction projects also afflicts Malaysia:

> "Abandonment of construction projects (ACP) is considered one of the most common and serious problems plaguing the Malaysian construction industry given the number and the value of the projects involved. It affects not only the immediate purchasers but also other project players and the general public."[3]

Chapter 11 of the DEIA admits of the STP2's potential abandonment.

> "11.6 Abandonment
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> "Should the reclamation works be abandoned, it may cause adverse impacts particularly with regards to physical stability, hydrodynamics, public safety, ecological conditions and sustainability, aesthetics, land use, social expectations and economic conditions. Temporary and permanent closure planning must be undertaken by the Project Proponent with appropriate environmental measures, while complying with laws and acts, public interest and ensuring the company's environmental standards are achieved. Table 11.20 shows the fundamental abandonment plan objectives.
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> "11.6.2 Permanent Closure
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> "Permanent closure may happen when there is no intent to resume reclamation activities as well as the topside development and the partially created land will remain as it is. As such, a permanent closure measures should be carried out by the Project Proponent."

Many if not all of the mitigation measures proposed in the DEIA, especially measures designed to mitigate impacts to fishing communities, depend on the project proponent remaining financially solvent. Therefore, a critical deficiency of the DEIA is its failure to identify who would pay for the implementation of mitigation measures if the project is abandoned or permanently closed.

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[2] Carrero, R. et al., 2009. Negative impacts of abandoned urbanisation projects in the Spanish coast and its regulation in the Law. Journal of Coastal Research, (SI 56), pp.1120–1124.

[3] YAP, E. H. (2013). *Causes of abandoned construction projects in Malaysia* (Doctoral dissertation, UTAR).

The DEIA contains an unfounded claim that the STP2 project would improve water quality

Chapter 14 is devoted to significant residual impacts and contains the following claim

> "14.3 Improvement in Water Quality
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> "Currently, discharges of Sungai Balik Batu, Sungai Fettes as well as several minor drain outlets are carried through a main drain separating the main land and the reclaimed land (SP1). The drains are oriented and flow in the north-south direction before finally being discharged at Bagan Jermal. Since there is sedimentation occurring at this outlet, the flow has been rather sluggish. The stagnation of the inherently poor water quality from upstream catchment has worsened the water quality along the drains and the mudflat.
>
> As part of STP2 project, the main drain will be extended further to the deeper navigation channel. The improved gradient afforded by the extended drain ensures better flushing, which eliminates problems related to sedimentation and stagnation of water in the main drain. It will also capture additional catchment areas from the main island as shown in Figure 14.2."

Extending a drain and ensuring better flushing does facilitate water flow, but this argument sounds like a "dilution is the solution to pollution" argument. Better water flow does not address the quantity of contaminants and solid waste entering the waterway and in fact more development substantially increases the likelihood that the quantities of the waste streams will be higher.

The DEIA may underestimate impacts associated with dredging

There's a discrepancy in their sediment loss models that is worth pointing out (italics mine):

Page 11-5 of the DEIA states:

> "Based on dredging experience, the sediment load released into the water column is considered to be 90 kg/m3 based on a *15% loss of dredged material* into the open waters."

Page 11-6 of the DEIA states:

> "The bed material at the proposed site consist mainly of fine material made up of coarse and silt clay together with much loose silt and fine sand. The presence of these fine sediments means that the material is vulnerable to be dispersed in the water column within the flushing channel."

Page 11-11 of the DEIA states:

> "A silt curtain's effectiveness is defined as the degree of turbidity reduction outside the screen relative to the turbidity levels inside the curtain's enclosure. The effectiveness of a silt curtain installation is highly variable due to the high degree of variability of the following factors:
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> a) Nature of operation;
> b) Quantity and type of material in suspension within or upstream of the curtain;
> c) Characteristics and condition of the curtain;
> d) Area and configuration of the enclosure, installation and mooring method; and
> e) Local oceanographic condition i.e. tides, currents, waves, etc.
>
> The efficiency of a silt curtain is primarily dependent on local oceanographic conditions. The retention can be as high as 80 to 90% for a situation where there are no tides, currents or waves. The efficiency will decrease with any deviation from this condition (Jin, 2003). Currents above 0.5 m/s, waves above 1 m and high tidal ranges (above 3 m) will result in retention factor of 25 to 40%. It is assumed that *the silt curtain shall to have a retention factor of 40%* [or a 60% loss] for these conditions."

A "no tides, currents, or waves" scenario doesn't exist in the ocean. Therefore, the lower values are a better estimate. It is possible that a retention factor 40% is an unrealistic assumption.