



2019 | Water Risk Assessment Result

Delta Electronics (Thailand) Public Company Limited



Foreword

Relentlessly, Delta Group's Sustainable Development study and performance improvement on natural resource management tracking. In this booklet, Sustainable Development Office has utilized reliable science-based tools to realize water risk in the area where Delta's major operation sites

Readers will learn the size of nearby water sources, national or international protection status, biodiversity values (such as species diversity and endemism, and public highlighted number of protected species), and value of the water source to your local communities and indigenous people. Finally, this resource of consolidated data should help to raise awareness of water and natural resources conservation specific to each area.

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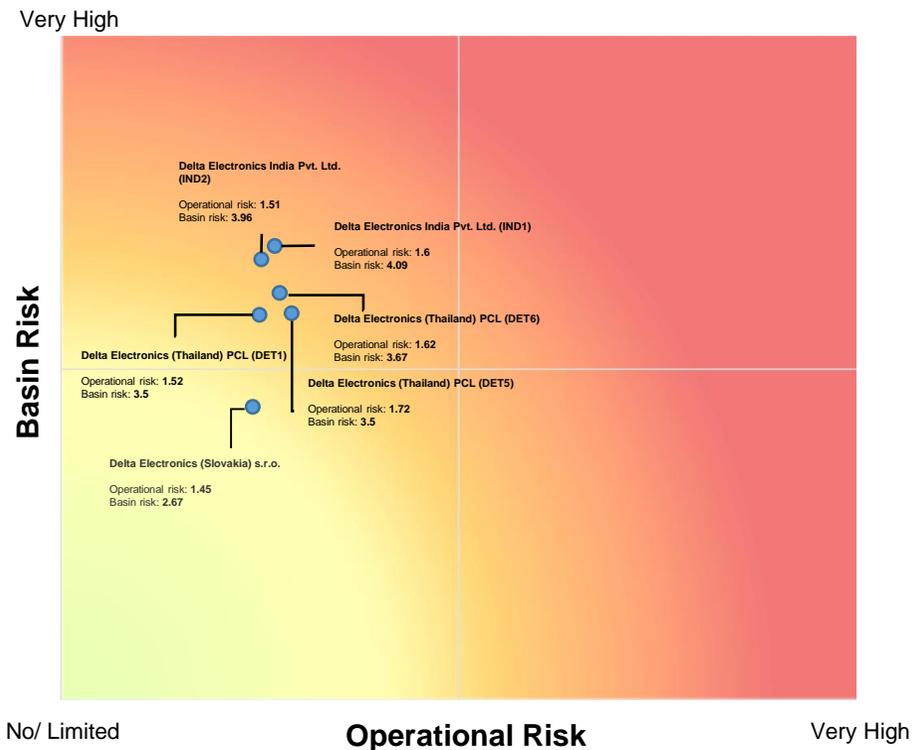
Scope: Delta Electronics (Thailand) Public Company Limited and its subsidiaries in India and Slovakia

Boundary: 100% of Delta Thailand's major manufacturing sites

Cycle: 1 Jan – 31 December

Publication: Annually in February

Delta Thailand's Water Risk Assessment Results



Delta Thailand's Water Risk Assessment

Delta Electronics (Thailand) Public Company and its subsidiaries (India and Slovakia) apply **India Water Tool** developed by the World Business Council for Sustainable Development (WBCSD) to assess Water Stress of India's sites and **WWF Water Risk Filter** and **WRI Aqueduct**, which recommended by WBCSD. Although Delta's water consumption is used for domestic and sanitary purpose only and has less impacts, Delta uses those water tools to analyze and assess its activities. Using the location of the factories and the volumes of water used from each source by factories to understand the potential relates links between local basin risks and operation risks and other factors for planning its water management ensuring its activities not to impact to stakeholders or communities.

The operational risk assessment

is based on the same aggregation principles and risk scoring levels into risk categories, risk category and risk type have weightings which are industry-specific. The Water Risk Filter 5.0 contains default industry-specific weightings for a total of 25 industry categories. In other words, the operational risk score varies according to the same 1-to-5 classification organized as follows:

- 1) No or very limited risk
- 2) Limited risk
- 3) Some risk
- 4) High risk
- 5) Very high risk

The results of the operational risk indicators are aggregated into risk categories which inform the overall risk scores for the 3 risk types: Physical, Regulatory and Reputational. The final overall operational risk score is aggregated based on the 3 risk type scores.

The basin risk assessment indicators are assigned to one of three risk types, and in turn, one of 12 risk categories and Each basin risk indicator, risk category and risk type have weightings which are industry-specific. The Water Risk Filter 5.0 contains default industry-specific weightings for a total of 25 industry categories (see Appendix 1 for detailed information of default weightings for each industry).

Delta Thailand's Water Risk Assessment Results

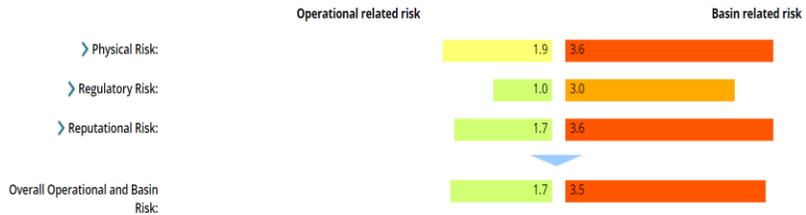
Risk chart for Delta Electronics (Thailand) PCL (DET1)

This site heat map provides direct insight in the aggregated risk scores for the selected site.



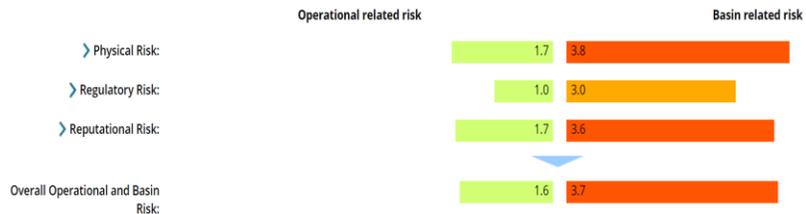
Risk chart for Delta Electronics (Thailand) PCL (DET5)

This site heat map provides direct insight in the aggregated risk scores for the selected site.



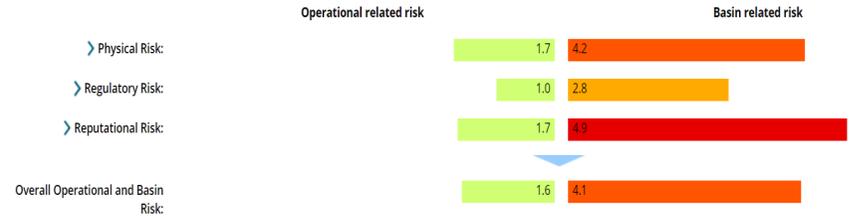
Risk chart for Delta Electronics (Thailand) PCL (DET6)

This site heat map provides direct insight in the aggregated risk scores for the selected site.



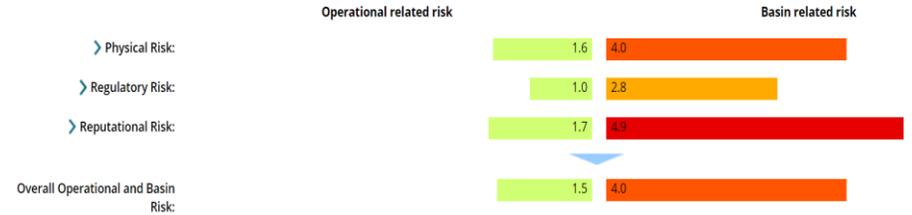
Risk chart for Delta Electronics India Pvt. Ltd. (IND1)

This site heat map provides direct insight in the aggregated risk scores for the selected site.



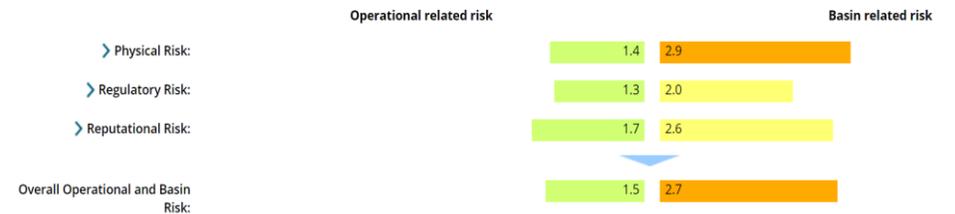
Risk chart for Delta Electronics India Pvt. Ltd. (IND2)

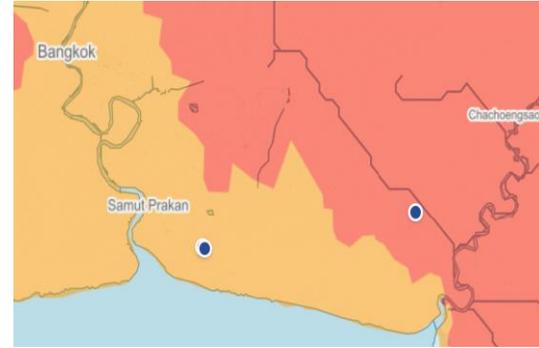
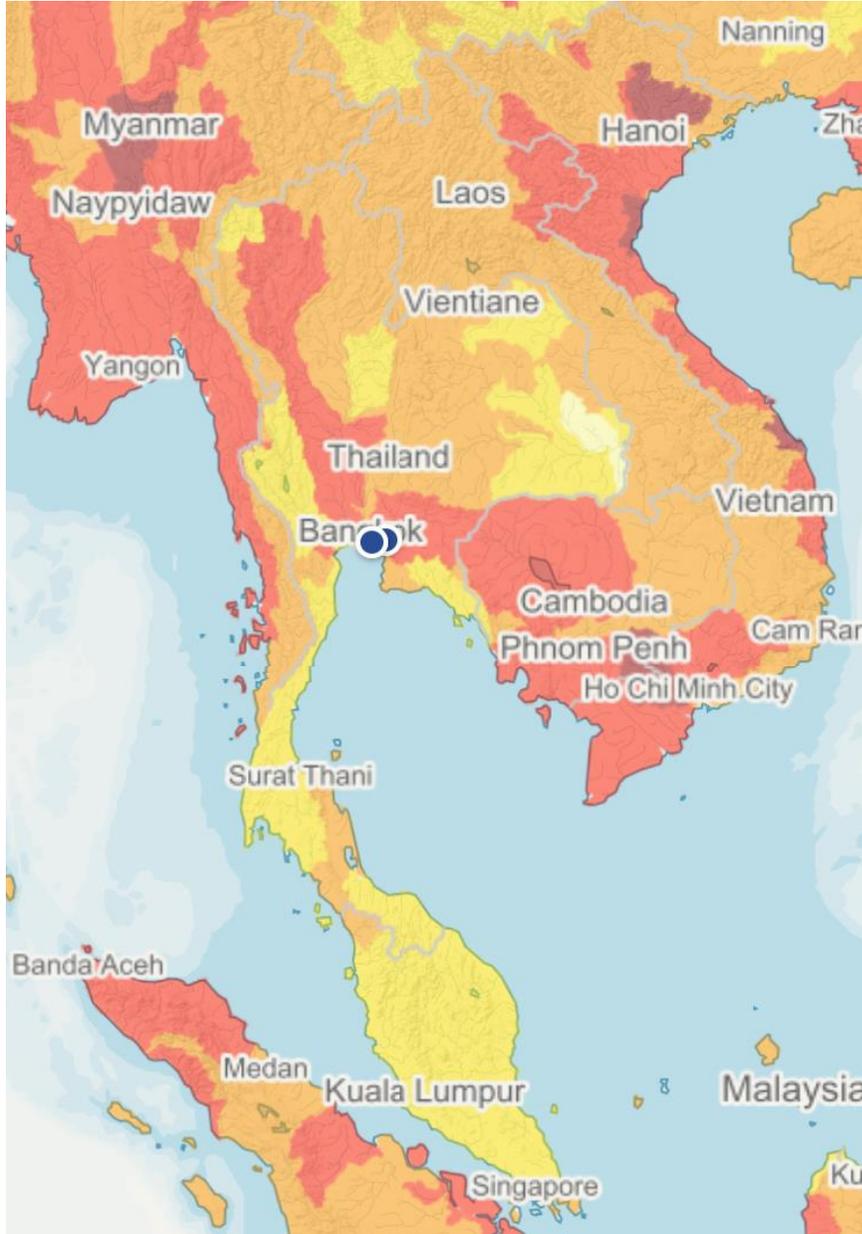
This site heat map provides direct insight in the aggregated risk scores for the selected site.



Risk chart for Delta Electronics (Slovakia) s.r.o.

This site heat map provides direct insight in the aggregated risk scores for the selected site.





Name	Input address	Match address	Latitude	Longitude	Major Basin	Minor Basin	Aquifer	Country	Province	Overall Water Risk
x DET5	-	-	13.550858	100.672012	Chao Phraya	Delta	-	Thailand	Samut Prakan	Medium - High (2-3)
x DET1	-	-	13.552214	100.669424	Chao Phraya	Delta	-	Thailand	Samut Prakan	Medium - High (2-3)
x DET6	-	-	13.588149	100.944592	Gulf of Thailand Coast	Sa Keo	-	Thailand	Chachoengsao	High (3-4)

Thailand

Thailand has substantial inland water resources in the form of numerous large river basins (Makong River and its several tributaries, Chao Phraya River basin, Ta Chin River basin). Inland capture fishery production increased drastically between 1986 and 1996., the production is dominated by unspecified freshwater fish (93,100 tonnes in 2015), which includes 47.4% of the report catch. Climbing perch, silver barb, tilapia ,striped snakehead and clariid catfish are the major identified species. (Welcomme and Food And Agriculture Organization Of The United Nations, 2011, pp.66-67,114).

Gulf of Thailand (GoT) is a semi-enclosed tropical sea located in the South China Sea (Pacific Ocean), surrounded by the countries Malaysia, Thailand, Cambodia and Vietnam (Charlier, 2006). The Gulf covers roughly 320,000 km². GoT contributes estimatly 68.5% of production of marine capture fisheries in Thailand (2.6 x 10⁶ tonnes in 2004) (www.fao.org, 2008).

Delta Thailand group's Water Risk Assessment Results

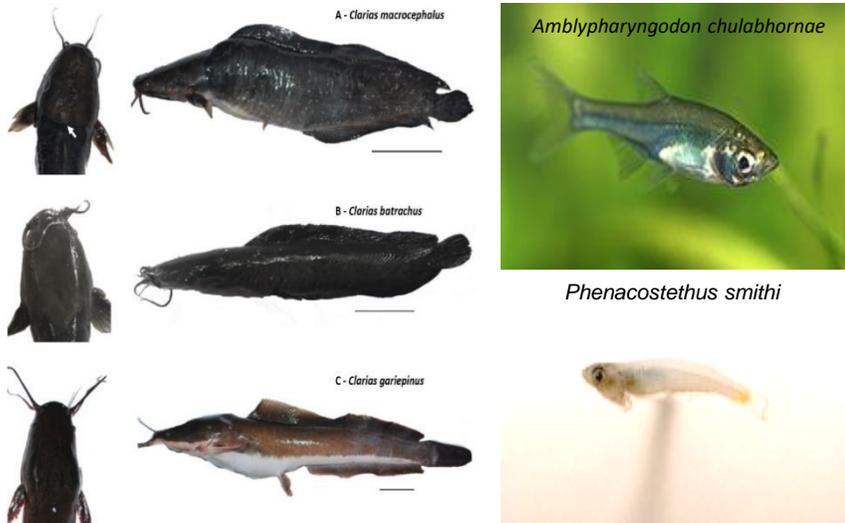
A water risk assessment results for Delta Thailand in 2019 using both local basin risks and operation risks assessment had been fully conducted as the risk charts demonstrated.

- **Operational related risk:** the results in the risk chart showed all Delta Thailand's operational related risk* was classified in class 1. which means "No or very limited risk" for 3 risk types (Physical, Regulatory and Reputational risks).
 - There was only 1 site in Thailand (DET5), received score 1.9 in Physical related risk which could be explained by the water consumption volume (water consumption 100,000-1,000,000 m³/year) based on Brauman et al.'s water depletion categories, DET5 was scored in the water depletion risk indicator at 3- Moderate risk which at least 10% water depletion of the time.
 - **Basin related risk,**** overall Delta Thailand's local basin risk result was scored at scale range 2.7-3.7 (Limited risk - Some risk) and 2 sites were scored at 4 (High risk)
 - **The overall scores** were reported at 2.7-3.7 because Delta Thailand sites according to its local basin Chao Phraya river data base in physical risk (reflects key issues regarding water); Quantity – Flooding and Quality was assessed at 4-5 score range (High risk – Very high risk)
 - **Flooding:** the recurrence of floods within the 34-year time frame period of 1985 to 2019. The occurrence of floods within a given location was estimated using data from Flood Observatory, University of Colorado. The Flood Observatory use data derived from a wide variety of news, governmental, instrumental, and remote sensing source. (*Global dataset- Basin level indicator*)
 - **Quality:** the quality was reported at 0.7-1.0 very high risk of surface water contamination according to Surface Water Contamination Index (*Global dataset: Basin level indicator*)
 - soil salinisation (weighting 11%)
 - nitrogen (N; 13%)
 - phosphorus (P, 13%) loading
 - mercury deposition (9%)
 - pesticide loading (13%)
 - sediment loading (12%)
 - organic loading (as Biological Oxygen Demand, BOD; 17%)
 - potential acidification (7%)
 - thermal alteration (7%) (Vörösmarty et al., 2010).
 - **Biodiversity Importance Risk:** The underlying data set for this risk indicator comes from the Freshwater Ecoregions of the World25 (FEOW) 2015 data developed by WWF and TNC. Companies operating in basins with higher number of endemic fish species are exposed to higher reputational risks. (please view more further detail in **Basin biodiversity related risk in Thailand** on page 5-7)
 - The high range score in reputation risk also presents the relation between the reputation and companies operating in basins with higher number of fish species are exposed to higher reputational risks. The underlying data set for this risk indicator comes from the Freshwater Ecoregions of the World (FEOW) 2015 data developed by WWF and TNC. Count of fish species is used as a representation of freshwater biodiversity richness. According to the Freshwater Ecoregions of the World (FEOW), The fresh water fish species in Thailand estimate is 214-322. (https://www.feow.org/global-maps/biodiversity/freshwater_fish_species_richness).
 - According to the study by Tanaka et al., 2015 surveyed fish assemblages and investigated environmental and landscape parameters in a total of 135 floodplain waterbodies (rivers, diversion canals, ponds, irrigation ditches, paddy fields, and wetlands) in the Chao Phraya River Basin. This study discovered the significance of floodplain area for fishes in the mid-region of the Chao Phraya River basin. The population of juvenile fishes was increased by floodplain connects to main river and it is used by fish species to forage and breed which support the fish species richness in Chao Phraya River basin. (please view more further detail in **Basin biodiversity related risk in Thailand** on page 5-7)
- * Operational related risk : the risk category and weightings in each specific industries. The Water Risk Filter 5.0 (WWF) contains default industry-specific weightings for a total of 25 industry categories (see Appendix 2 for detailed information on the default weightings for each industry)
- ** Local Basin risk: the global level water risk data is developed and integrated by WWF to have higher resolutions data sets into the Water Risk Filter 5.0 to provide country-specific local risk indicators for conducting risk assessment at a finer scale. (The Water Risk Filter 5.0 currently has local data sets available for the following countries and regions: Great Britain; South Africa; Brazil; Colombia; Spain; Greater Mekong countries (Thailand, Vietnam, Laos, Cambodia))

Basin biodiversity related risk in Thailand

Thailand, is abundant in biological resources, according to FishBase, approximately 875 fish species are found in the country (www.fishbase.in, n.d.). However, the number of Thai native fish species has declined gradually. It may cause of the result from the introduction of non-indigenous species, one of the critical threats to biodiversity worldwide (Crowl et al., 1992; Lowe et al., 2000; Munro et al., 2005; Hubilla et al., 2007). Biodiversity loss is of global concern, as indicated by the designation of 2011–2020 as the Decade on Biodiversity by the General Assembly of the United Nations. (Sala et al., 2000; Dirzo and Raven, 2003; Butchart et al., 2010). Exploration of fish fauna in Western Chaophraya Basin in October 2008 (flood season) and January 2009 (dry season) found species including 3 threatened species such as *Clarias batrachus*, *Phenacostethus smithi* and *Amblypharyngodon chulabhornae*. The invasive alien species, *Pterygoplichthys pardalis* also reported. (Santi et al., 2010) In 2013, The study found the populations of Thai native fish had declined and the further studies indicated that *Pterygoplichthys*, an invasive alien fish (Chaichana et al., 2011). In accordance with the study in Alien Aquatic Species in Thailand by Apichart et al., 2003 found Invasive alien species (IAS) 4 species : *Clarias gariepinus*, *Hypostomus spp.*, *Pterygoplichthys sp.*, *Oreochromis mossambicus*. Later in 2013, the study focus on the foraging effects of *Pterygoplichthys* on the native *Clarias macrocephalus* in Thailand, which found *Pterygoplichthys* consumed and destroyed the first-feeding fry of the native catfish *Clarias macrocephalus* and also has the potential to decrease the populations of Thai native fish species (Chaichana, Pouangcharean and Yoonphand, 2013).

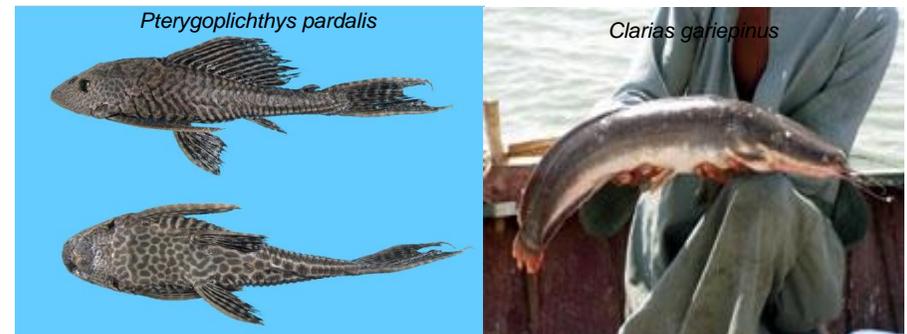
Threatened Native fish species in Chao Phraya basin



Source: Low genetic diversity in *Clarias macrocephalus* Günther, 1864 (Siluriformes: Clariidae) populations in the Philippines and its implications for conservation and management (Tan, Jumawan and Quilang, 2016)

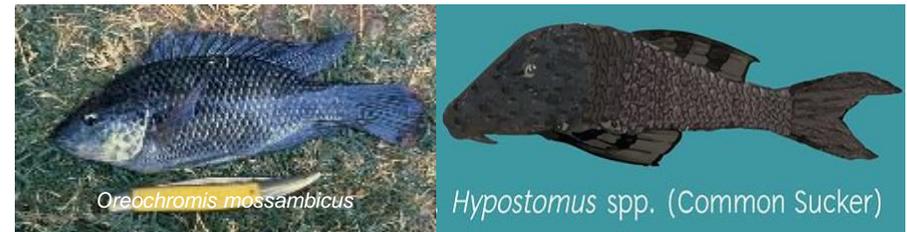
Source: ww.fishbase.in, n.d.

Invasive alien species (IAS)



Source: Occurrence of suckermouth armored catfish (Siluriformes, Loricariidae, Pterygoplichthys) in inland waters of Israel (Golani and Snovsky, 2013)

Source: ww.fishbase.in, n.d.



Source: ww.fishbase.in, n.d.

Source: https://www.posttoday.com/social/think/442940

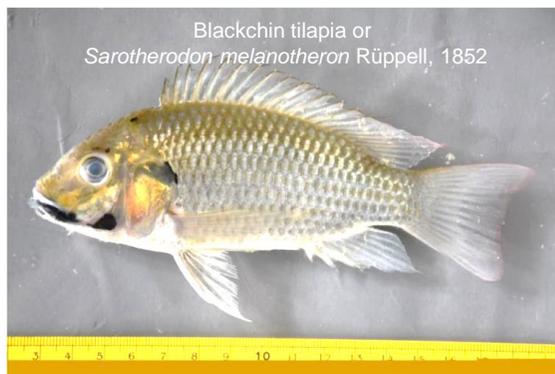
LEGISLATION RELEVANT TO ALIEN INTRODUCTION There are three relevant legal instruments that control aquatic alien introductions in Thailand. The Fisheries Act that prohibits imports of piranhas and sucker catfish, and regulates all imports of aquatic animals. The National Park Act and Wildlife Conservation Act that prohibits carrying and release of any animal into National Parks and Wildlife Sanctuary areas. The import of all living aquatic species is also controlled by the Ministry of Commerce.

Basin biodiversity related risk in Thailand *(continue)*

In Thailand 2018, There was the problems that have been found outbreak of cichlids (Invasive alien species), black cichlids (*Sarotherodon melanotheron* Rüppell, 1852), **Mayan fish** (*Cichlasoma urophthalmus* (Günther, 1862)) and butter cows (*Heterotilapia buttkoferi* (Hubrecht, 1881)) caused some suffering to the fish farmers in Thailand. These invasive alien species had been detected adapting very well in nature , other water sources and tolerant . These alien species were reported the escaping into the fish farms and appeared in Chao Phraya river basin due to the waterbodies throughout the Chao Phraya delta are interconnected and subject to flooding (Nico, Beamish and Musikasinthorn, 2007). The invasive alien species was studied that their invasion impacts to food chain in ecological system of local aquatic fish in Thailand which might lead to unavoidable extinction (พลาศชัย et al., 2019). The reduction of number local aquatic animals was detected especially in Bangkok, Chumphon, Kanchanaburi, Prachuap Khiri Khan, Phetchaburi, Ratchaburi, Samut Prakan, Samut Sakhonand, Samut Songkhram provinces (more detail in: https://www4.fisheries.go.th/local/file_document/20180309101422_1_file.pdf).

The ban on these invasive fish was announce on 18 January 2018 and effective on 19 March 2018 which was imposed under Section 65 of the Fisheries Act, the National News Bureau regarding to Notification of the Ministry of Agriculture and Cooperatives Re: Specifying species of aquatic animals that are prohibited to import, export, transit or cultivate (more detail in : <http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/011/32.PDF>) (Bangkok Post Public Company, 2018) (Notification of the Ministry of Agriculture and Cooperatives, 2018). The invasive alien fishes rapidly spread and reproduce in natural and artificial inland and coastal environments. The invasive species are a significant driver of native species declines and also a reason of biodiversity loss driven by habitat degradation. They destroy the first-feeding fry of the native species fish, are behaviorally tolerant to climate change and difficult to be removed. According to Notification of the Ministry of Agriculture and Cooperatives, the fish farmers have to hand over three types of cichlids: Blackchin tilapia, Mayan cichlid and Zebra tilapia. The violators of the ban are liable to a maximum penalty of one year in prison and/or a fine of 1 million baht. (Notification of the Ministry of Agriculture and Cooperatives, 2018).

Three non-native cichlid fishes in Chao Phraya River basin, Thailand



Source:
https://www4.fisheries.go.th/local/pic_activities/201802221729471_pic.pdf



Source:
https://www4.fisheries.go.th/local/file_document/20180309101422_1_file.pdf

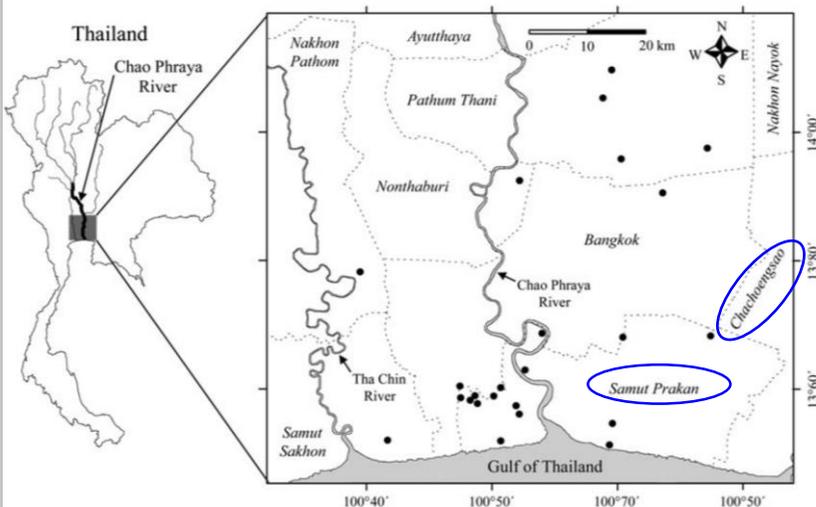


Source:
https://www4.fisheries.go.th/local/file_document/20180309101422_1_file.pdf

Basin biodiversity related risk in Thailand *(continue)*



Mayan fish (*Cichlasoma urophthalmus* (Günther, 1862))
 Specimen (>100 mm TL) identified by Nico, Beamish and Musikasinthorn, 2007. Fish was collected 26 September 2005 by Jean-Francois Helias while angling in the lower Chao Phraya River delta, Thailand. Photograph by J.-F. Helias.
 Source: Nico, Beamish and Musikasinthorn, 2007



Source: Tomojiri, Musikasinthorn and Iwata, 2019 (collection localities (black dots) in the lowermost Chao Phraya River basin in the present study. Broken lines indicate provincial boundaries. Provincial names are in italic.)

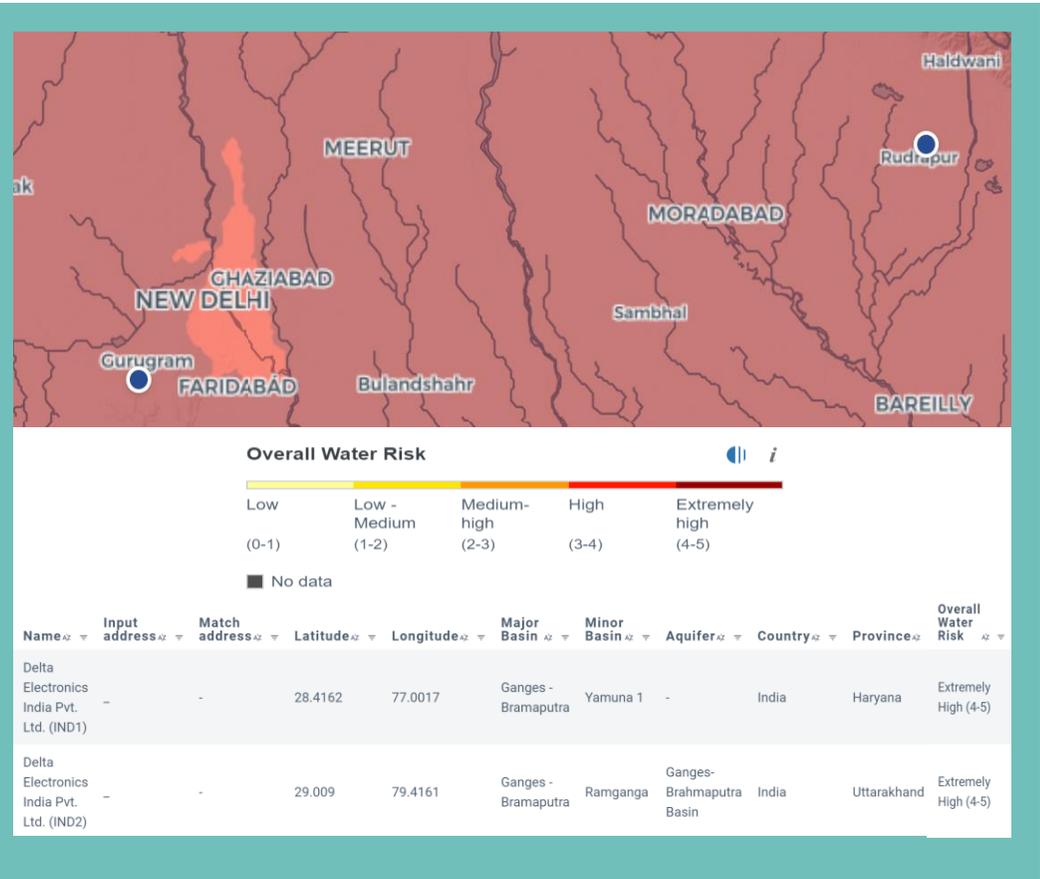
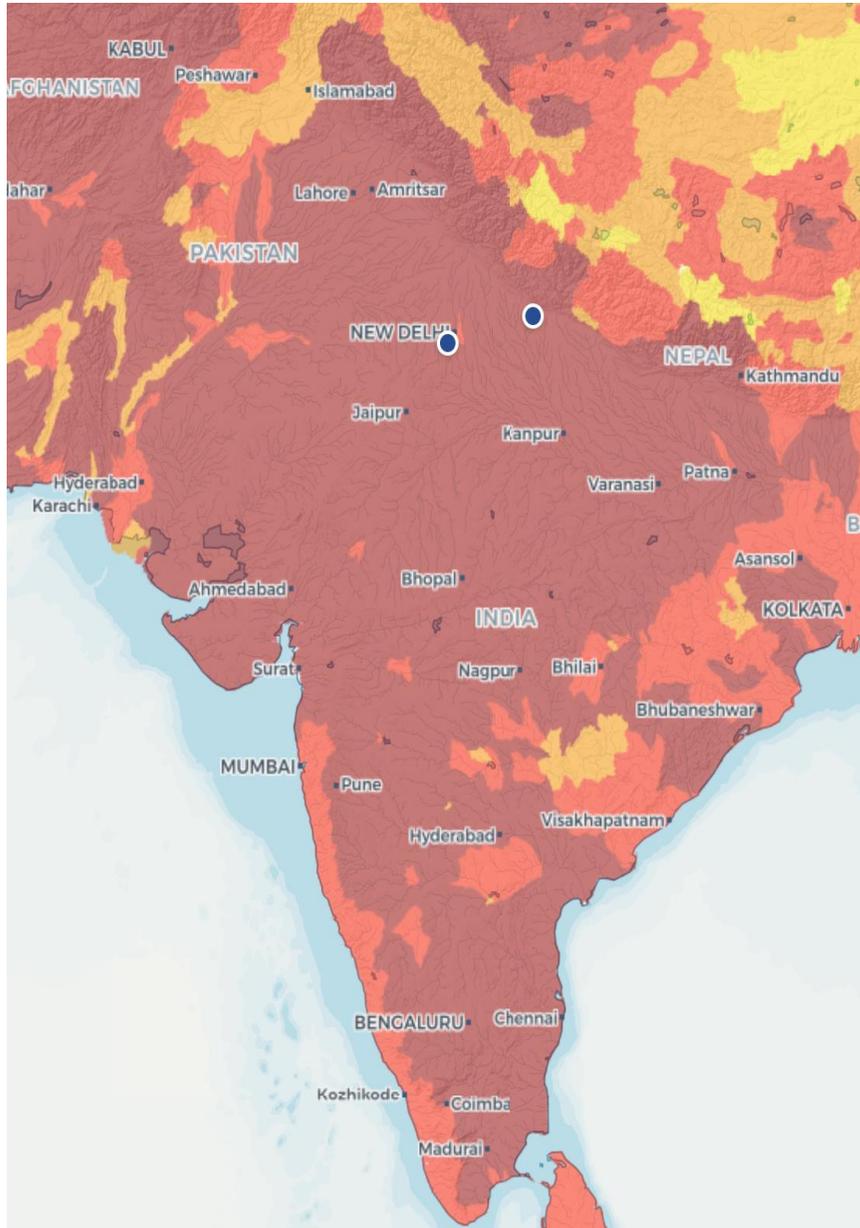
Delta electronics (thailand) public company, the company has 3 sites which 2 sites are located in Samut Prakan Province (Bangpoo Industrial Estate) and 1 site is located in Chachoengsao province (Wellgrow Industrial Estate). Samut Prakan province is identified the propagation of the invasive alien species, mainly Mayan fish (*Cichlasoma urophthalmus* (Günther, 1862)) which reported the escaping in to the fish farms and destroyed the native fish ecological systems.

The study in 2007 of *Cichlasoma urophthalmus* or Mayan fish in Thailand was firstly found the invasion of Mayan fish in 2005 according to the photographs by Mr. Jean-Francois Helias, were taken in September 2005 showing a fish that identified as the Mayan Cichlid "*Cichlasoma urophthalmus*" which was caught from the a brackish water canal that junction to Chao Phraya River in Bang Khun Thian District (Nico, Beamish and Musikasinthorn, 2007).

According to the data in Thailand on 30 August 2018 from Fisheries Resources Management and Measures Determination Division, Department of Fisheries in Thailand reported that Mayan fish was found in Amphoe Phra Samut Chedi, Samut Prakan Province by a local fisherman who used different types of gear, including traps, nets, and hook-and-line and also found in the cannel water for shrimp and fish farms. This invasion of Mayan fish impacted to the native fish species, destroy their habitats and juvenile fishes/shrimps (Notification of the Ministry of Agriculture and Cooperatives, 2018).

These alien species were reported the escaping into the fish farms and appeared in Chao Phraya river basin due to the waterbodies throughout the Chao Phraya delta are interconnected and subject to flooding (Nico, Beamish and Musikasinthorn, 2007).

Recently study in 2019 reported the specimens of Mayan fish (*Cichlasoma urophthalmus* or *Mayaheros urophthalmus*) were collected from the lower Chao Phraya River basin (see the picture below) in 2014-2015. The specimens were examined and analysed the stomach contents. The result found *M. urophthalmus* utilised more widely varied prey resources, particularly fish in the smaller-size class but the main food item of small fish. The larger Mayan fish tended to consume various aquatic animals (Tomojiri, Musikasinthorn and Iwata, 2019). This recent study supported the impact of the invasion of Mayan fish in Thailand which in accordance with Thailand's Notification of the Ministry of Agriculture and Cooperatives Re: Specifying species of aquatic animals that are prohibited to import, export, transit or cultivate, The violators of the ban are liable to a maximum penalty of one year in prison and/or a fine of 1 million baht. (Notification of the Ministry of Agriculture and Cooperatives, 2018).



Overall Water Risk



Name	Input address	Match address	Latitude	Longitude	Major Basin	Minor Basin	Aquifer	Country	Province	Overall Water Risk
Delta Electronics India Pvt. Ltd. (IND1)	-	-	28.4162	77.0017	Ganges - Bramaputra	Yamuna 1	-	India	Haryana	Extremely High (4-5)
Delta Electronics India Pvt. Ltd. (IND2)	-	-	29.009	79.4161	Ganges - Bramaputra	Ramganga	Ganges-Brahmaputra Basin	India	Uttarakhand	Extremely High (4-5)

India

Gurgaon district is situated on South eastern part of Haryana state has an area of 1200 sq.km. In the North, it is bordered by the Union Territory of Delhi, in the east by Faridabad, in the North west by Jhajjar and Rewari districts of Haryana and in the west by the Alwar district of Rajasthan state and south by the Mewat district of Haryana state (Gurgaon district at a glance si.no. Items Statistics,n.d.).

Rudrapur city is the district headquarter of district Udham Singh Nagar in Uttarakhand state. The Rudrapur city is situated in Terai region of district Udham Singh Nagar at a distance of 72 Kms from Nainital. There are two rivers known as Kalyani and Begul flows through the city area (Abhishek, Saurabh and Dhawal, 2019).

Delta India's Water Risk Assessment Results *(continue)*

- **Basin risk scores** *(continue)*, **overall Delta Thailand's local basin risk result was scored at scale range 2.7-3.7 (Limited risk - Some risk) and 2 sites were scored at 4 (High risk) is the site located in India.
 - **The overall scores** were reported at 4 (High risk) which the sites locate in India. The risks types that received score 4-5 (High risk – Very high risk) were; Physical risk and Reputational risk.
 - **The physical risk** was reported range 4.0-4.2 (High risk) as the consequence of scores in Quantity – Flooding and Quality, the categories in physical risk type using Global dataset Basin level indicator;
 - **Flooding**: the recurrence of floods within the 34-year time frame period of 1985 to 2019. The occurrence of floods within a given location was estimated using data from Flood Observatory, University of Colorado. The Flood Observatory use data derived from a wide variety of news, governmental, instrumental, and remote sensing source. *(Global dataset- Basin level indicator)*
 - **Quality**: the quality was reported at 0.7-1.0 very high risk of surface water contamination according to Surface Water Contamination Index *(Global dataset: Basin level indicator)*
 - soil salinisation (weighting 11%)
 - nitrogen (N; 13%)
 - phosphorus (P, 13%) loading
 - mercury deposition (9%)
 - pesticide loading (13%)
 - sediment loading (12%)
 - organic loading (as Biological Oxygen Demand, BOD; 17%)
 - potential acidification (7%)
 - and thermal alteration (7%)
 - **The reputational risk** score was reported at 4.0 – 4.9 (High risk) from culture importance, media Scrutiny and conflict, the categories in reputational risk type.
 - **Culture importance**: Number of ethnolinguistic groups: >100, this risk indicator is based on Oviedo and Larsen (2000) data set, which mapped the world's ethnolinguistic groups onto the WWF map of the world's ecoregions. *(Global dataset- Country level indicator)*
 - **Media Scrutiny**: Permanent (> per week), this risk indicator is based on joint qualitative research by WWF and Tecnoma (Typsa Group)13. It indicates how aware local residents typically are of water-related issues due to national media coverage. The indicator is on the assumption that businesses face higher reputational risks when operating in countries with higher local/national media coverage reporting on water-related issues. *(Global dataset- Country level indicator)*
 - **Conflict**: Very high conflict potential, This risk indicator is based on 2018 data collected by RepRisk on counts and registers of documented negative incidents, criticism and controversies that can affect a company's reputational risk. These negative news events are labelled per country and industry class. *(Global dataset- Country level indicator)*

Risk chart for Delta Electronics India Pvt. Ltd. (IND1)

This site heat map provides direct insight in the aggregated risk scores for the selected site.



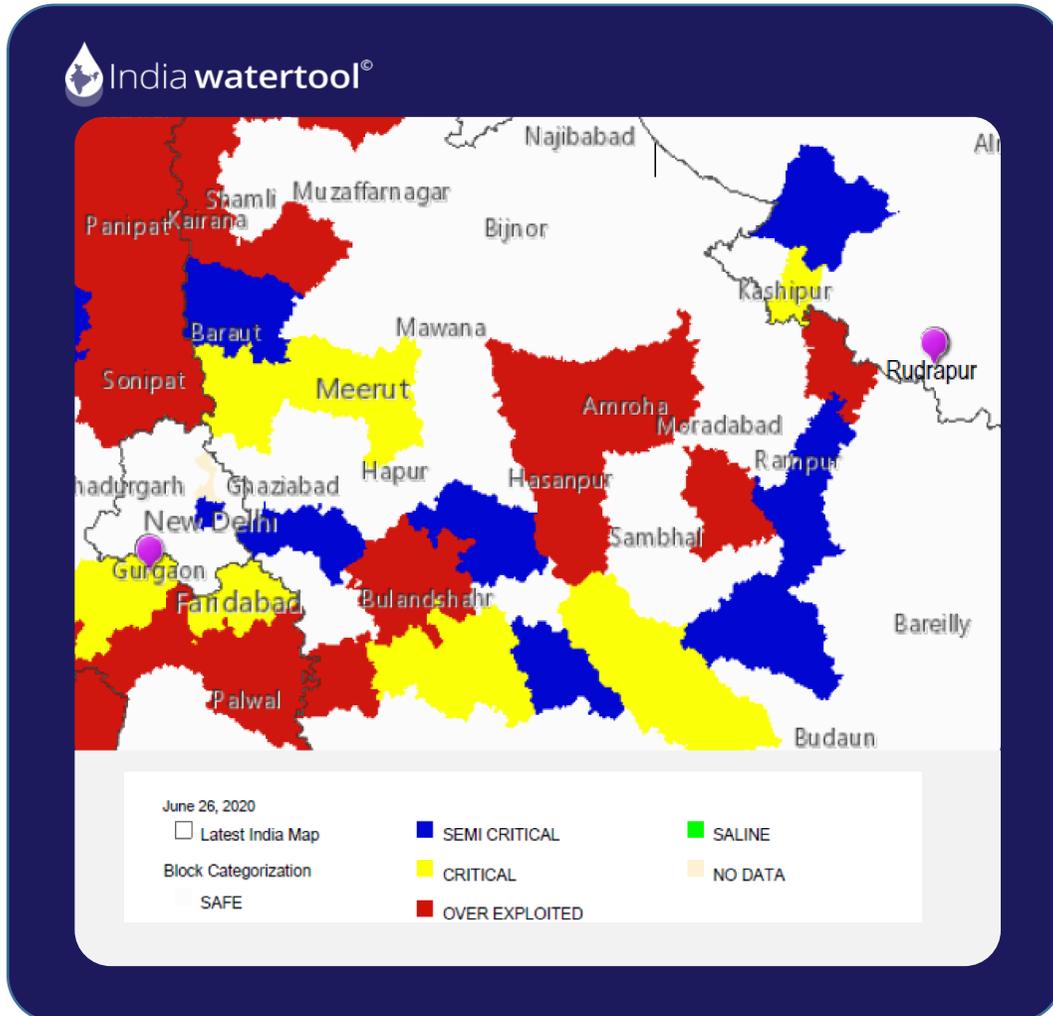
Risk chart for Delta Electronics India Pvt. Ltd. (IND2)

This site heat map provides direct insight in the aggregated risk scores for the selected site.



Delta India's Water Risk Assessment Results *(continue)*

As the result of Delta Thailand's Water Risk Assessment Result, Delta Thailand keeps continuously monitoring and researching on the impact of the water consumption of its subsidiaries that located in basin related risk, especially the sites in India which were found overall score of basin related risk type in physical risk and reputational risk categories at range 4.0- 4.9. Thus Delta Thailand used **India Water Tool 3.0** (IWT3.0) to understand further in the water risks activities and the water risks associated at India sites for the water management interventions plan in the future.



The result of using India Water Tool 3.0 found 1 of 2 sites in India is located in the block categorization zone, Gurgaon district, Haryana state, India. In Haryana, the 96.8% of the total irrigation main source is tube-well. The use of underground water for agricultural and other uses has depleted the ground water to the level of over exploited category (Malik, Singh and Singh, 2012).

Central Ground Water Authority (CGWA) by Government of India has set the groundwater block categorization as regulation of groundwater development for domestic and industrial water use purpose. There is 162 blocks across the country have been notified for regulation of groundwater development by CGWA. Haryana state, Gurgaon is in the list of "Notified Areas" and categorized in "Critical" Area (<http://cgwa-noc.gov.in/LandingPage/AreaType/ListNotified.pdf>) which withdrawal permit for **Non-water intensive industries** should not exceed 100% of the recharged quantity and In notified areas abstraction of ground water is not permissible for any purpose other than drinking and domestic use (<http://cgwa-noc.gov.in/LandingPage/AreaType.htm>).

Delta India's Water Risk Assessment Results *(continue)*



Ground Water Availability

■ Output in extremely high-risk range ■ Output in high-risk range

Location	Aquifer Properties			Availability Status						
Site ID #	Site Name	Type	Aquifer System	Aquifer Yield	GWL (pre-monsoon) 2017	GWL (post-monsoon) 2017	GWav	GW Block Category	Notified Block	Stage of GW Development (%)
IND1	Delta Electronics India Pvt. Ltd.	Semi-Confined to Confined	Alluvium	6 - 12%	No Data	No Data	23,827	Critical	Yes	226.00
IND2	Delta Electronics India Pvt. Ltd.	Unconfined	Alluvium	8 - 15%	3.86	3.07	63,421	Safe	No	79.00

(GWL)	Ground Water Level (m below ground level)	(GW)	Ground Water	GWav	Net Ground Water Availability (Hectare metre)
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According to the Notified areas are those blocks / talukas / mandals / areas which have been notified under Environment (Protection) Act, 1986 by Central Ground Water Authority for regulation of ground water development and management. In notified areas abstraction of ground water is not permissible for any purpose other than drinking and domestic use. Haryana state's Net Ground Water Availability is at 23,827 Hectare meters or equal to 238,270,000 Cubic meters (m³). Delta's site in Gurgaon, Haryana state which is **Non-water intensive industries** does not use water as raw material, categorized in "Critical" of Withdrawal permitted and not over 100% of recharge proposed (see Appendix 3 CGWA criteria for Water withdrawal and recharge by industries). The site's ground water withdrawal is only for domestic purpose and it doesn't not exceed 100% of the recharged quantity in the consequence of the operational related risk result, physical risk was classified in 1.7 (No or very limited risk)

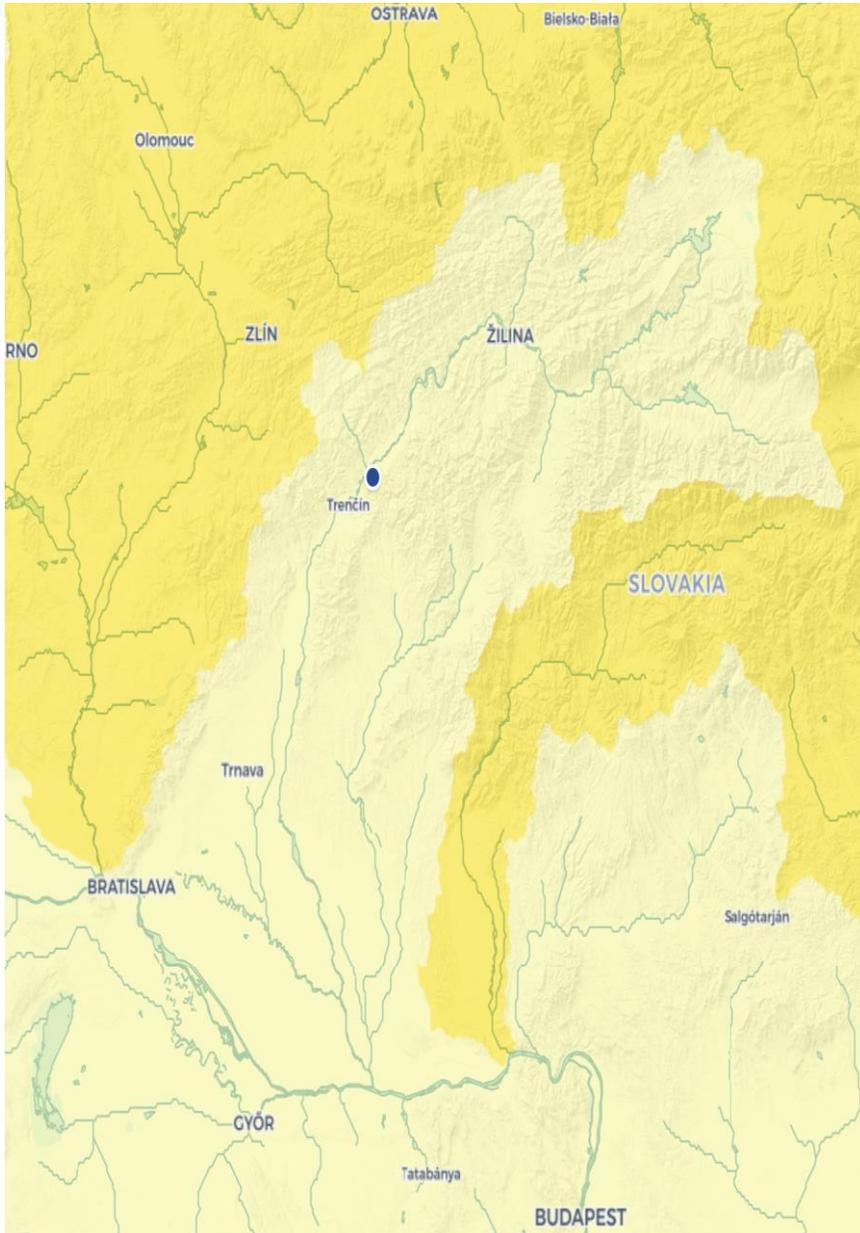
Risk chart for Delta Electronics India Pvt. Ltd. (IND1)

This site heat map provides direct insight in the aggregated risk scores for the selected site.

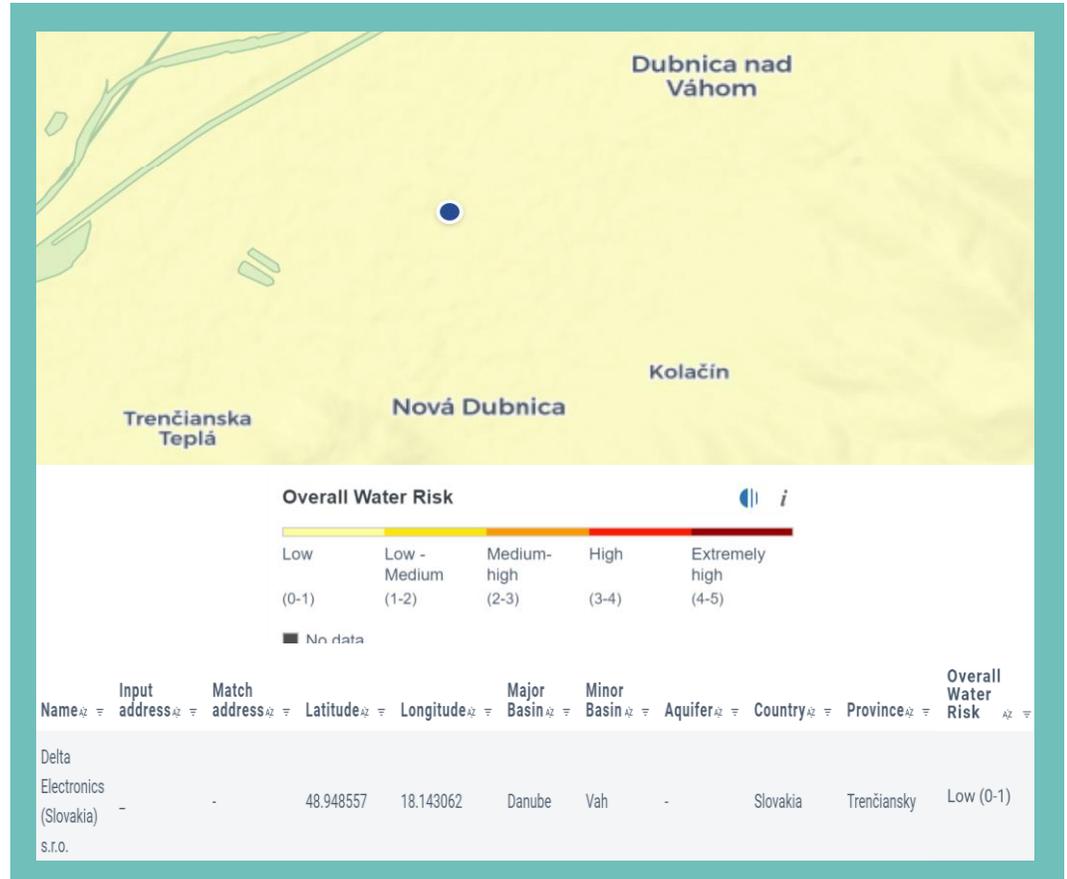


CGWA criteria for Water withdrawal and recharge by industries

Groundwater Block Category	Withdrawal permitted and % of recharge proposed	
	Non-water intensive industries	Water Intensive industries, and those using Groundwater as a raw material
Safe	NOC required for groundwater withdrawal subject to adoption of artificial recharge to ground water.	Withdrawal should not exceed 200% of the recharged quantity.
Semi Critical	Withdrawal may be permitted subject to undertaking of ground water recharge** measures. The withdrawal should not exceed 200% of the recharged quantity.	Withdrawal should not exceed 100% of the recharged quantity.
Critical	Withdrawal may be permitted subject to undertaking of ground water recharge** measures. The withdrawal should not exceed 100% of the recharged quantity.	Withdrawal should not exceed 50% of the recharged quantity.
Over Exploited	Withdrawal may be permitted subject to undertaking of ground water recharge** measures. The withdrawal should not exceed 50% of the recharged quantity.	No permission for industries under this category.



<https://tinyurl.com/y33q1haw>



Slovakia

Slovakia is drained by rivers forming part of Danube basin, which drained an area of 47,087 km². In addition, there are 8,164 km of canals for drainage, irrigation and navigation. The country features many relatively small, mainly artificial, waterbodies (pond and reservoirs) with a total area of 938 km². A total of 59 recent native and 18 non-native (nine invasive) species of fishes and lampreys currently inhabit aquatic habitats in Slovakia. In salmonid waters, brown trout *Salmo trutta fario* predominates, followed by grayling *Thymallus thymallus*, whereas in non-salmonid waters, common carp *Cyprinus carpio* is the main species associated with the fisheries. (Welcomme and Food And Agriculture Organization Of The United Nations, 2011, pp.66-67,114)

Conclusion

Although water is not our production factor or used in manufacturing process, Delta Electronics Thailand and its subsidiaries has taken many measures to conserve clean and accessible water for our local community. Based on Delta's water consumption breakdown, 95% of the water used by Delta's own operation sites for domestic and sanitary purpose. However, we are continuously tracking our water management systems and water quality, covering all plants in Thailand and our subsidiaries (India and Slovakia), to ensure that our operations will not impact water to stakeholders or communities especially the nearby basins. The assessment was detected 2 sites of Delta has high risks in Basin which are the sites in Thailand and India.

- 1) DET1, DET5, DET6 are found seriously basin risks about **Flooding, Quality and Biodiversity Importance Risk** which these 3 issues are significantly coherent. The closely tracking and monitoring of water management systems are implemented and annually observing on water quality and biodiversity's change around the sites.
- 2) India's site in Gurgaon is classified in Groundwater Block category as "Critical" in withdrawal permission and recharge proposed classified in **Non-water intensive industries** which means the permission of groundwater withdrawal are allowed at the limited not over 100% of water recharge. The highly monitoring and water management system tracking are implemented closely along with the observation of the forecast groundwater level in Haryana state every year to prevent the risk water situation that might happen. In additional, the water management team will discuss the opportunities and feasibilities to implement water projects at the site for water saving and groundwater recharge.
- 3) Slovakia's site, there is no risks found within Slovakia's site yet, however we will keep tracking the water management closely in each year to maintain the good practices and monitoring the current update status of water.



APPENDIX 1. Basin Risk Assessment

Table 1. Industry-specific weightings for risk types, categories and indicators.

Industry	Physical Risk	Regulatory Risk				Reputation Risk	Reputation Risk								
		1. Quantity - Scarcity	2. Quantity - Flooding	3. Quality	4. Ecosystem Service Status		5. Enabling Environment (Policy & Laws)	6. Institutions and Governance	7. Management Instruments	8 - Infrastructure & Finance	9. Cultural Importance	10. Biodiversity Importance	11. Media Scrutiny	12. Conflict	
	Risk type	Risk category				Risk type	Risk category				Risk type	Risk category			
Averages	60%	49%	20%	17%	14%	20%	30%	30%	25%	15%	20%	16%	11%	43%	30%
1 Agriculture (animal products)	75%	55%	15%	20%	10%	20%	30%	30%	25%	15%	5%	20%	10%	50%	20%
2 Agriculture (plant products)	70%	70%	10%	5%	15%	20%	30%	30%	25%	15%	10%	20%	10%	50%	20%
3 Appliances & General Goods Manufacturing	60%	35%	25%	20%	20%	20%	30%	30%	25%	15%	20%	20%	10%	50%	20%
4 Automotive, Electrical Equipment & Machinery Production	65%	40%	20%	30%	10%	15%	30%	30%	25%	15%	20%	20%	10%	40%	30%
5 Chemicals & Other Materials Production	60%	35%	20%	30%	15%	15%	30%	30%	25%	15%	25%	10%	10%	40%	40%
6 Construction Materials	55%	55%	25%	5%	15%	20%	30%	30%	25%	15%	25%	20%	10%	50%	20%
7 Electric Energy Production - Combustion (Biomass, Coal, Gas, Nuclear, Oil)	60%	65%	10%	15%	10%	20%	30%	30%	25%	15%	20%	15%	10%	40%	35%
8 Electric Energy Production - Hydropower	65%	50%	25%	10%	15%	20%	30%	30%	25%	15%	15%	20%	10%	30%	40%
9 Electric Energy Production - Solar, Wind	35%	55%	20%	5%	20%	35%	30%	30%	25%	15%	30%	10%	20%	30%	50%
10 Electronics & Semiconductor Manufacturing	65%	45%	15%	30%	10%	15%	30%	30%	25%	15%	20%	20%	10%	40%	30%
11 Fishing and aquaculture	50%	45%	5%	30%	20%	30%	30%	30%	25%	15%	20%	20%	10%	30%	40%
12 Food & Beverage Production	70%	70%	10%	15%	5%	10%	30%	30%	25%	15%	20%	10%	5%	40%	45%
13 Food Retailing	40%	50%	20%	20%	10%	25%	30%	30%	25%	15%	35%	10%	10%	50%	30%
14 General or Speciality Retailing	45%	50%	20%	20%	10%	20%	30%	30%	25%	15%	35%	15%	10%	55%	20%
15 Health Care, Pharmaceuticals and Biotechnology	65%	40%	20%	25%	15%	25%	30%	30%	25%	15%	10%	30%	10%	50%	10%
16 Hospitality Services	55%	30%	25%	20%	25%	15%	30%	30%	25%	15%	30%	20%	10%	40%	30%
17 Metals & Mining	70%	60%	25%	5%	10%	5%	30%	30%	25%	15%	25%	5%	15%	40%	40%
18 Oil, Gas & Consumable Fuels	70%	65%	20%	5%	10%	5%	30%	30%	25%	15%	25%	5%	15%	40%	40%
19 Paper & Forest Product Production	70%	55%	10%	20%	15%	10%	30%	30%	25%	15%	20%	10%	10%	45%	35%
20 Professional Services, Software, Real Estate, Financial Institutions	40%	35%	35%	15%	15%	40%	30%	30%	25%	15%	20%	15%	5%	60%	20%
21 Telecommunication services (Including wireless)	50%	50%	25%	10%	15%	30%	30%	30%	25%	15%	20%	20%	10%	40%	30%
22 Textiles, Apparel & Luxury Good Production	65%	50%	15%	20%	15%	15%	30%	30%	25%	15%	20%	20%	10%	50%	20%
23 Transportation Services	65%	40%	35%	5%	20%	20%	30%	30%	25%	15%	15%	20%	10%	40%	30%
24 Water utilities / Water Service Providers	70%	40%	20%	25%	15%	25%	30%	30%	25%	15%	5%	20%	15%	40%	25%
25 Other (cross-sector average)	60%	49%	20%	17%	14%	20%	30%	30%	25%	15%	20%	16%	11%	43%	30%

APPENDIX 2. Operational Risk Assessment

Table 1. Industry-specific weightings for risk types, categories and indicators for full version questionnaire.

#	Industry	Risk type			Risk category			Risk type		
		Physical Risk	Scarcity (Quantity)	Quality	Regulatory Risk	Laws & Policy	Institutions and Governance	Reputational Risk	Media Scrutiny	Community Conflict
1	Agriculture (animal products)	75%	73%	27%	20%	50%	50%	5%	35%	65%
2	Agriculture (plant products)	60%	93%	7%	25%	50%	50%	15%	35%	65%
3	Appliances & General Goods Manufacturing	60%	64%	36%	20%	50%	50%	20%	35%	65%
4	Automotive, Electrical Equipment & Machinery Production	65%	57%	43%	15%	50%	50%	20%	35%	65%
5	Chemicals & Other Materials Production	60%	54%	46%	15%	50%	50%	25%	35%	65%
6	Construction Materials	50%	92%	8%	20%	50%	50%	30%	35%	65%
7	Electric Energy Production - Combustion (Biomass, Coal, Gas, Nuclear, Oil)	60%	81%	19%	20%	50%	50%	20%	35%	65%
8	Electric Energy Production - Hydropower	65%	83%	17%	20%	50%	50%	15%	35%	65%
9	Electric Energy Production - Solar, Wind	35%	92%	8%	35%	50%	50%	30%	35%	65%
10	Electronics & Semiconductor Manufacturing	65%	60%	40%	15%	50%	50%	20%	35%	65%
11	Fishing and aquaculture	50%	60%	40%	30%	50%	50%	20%	35%	65%
12	Food & Beverage Production	70%	82%	18%	10%	50%	50%	20%	35%	65%
13	Food Retailing	40%	71%	29%	25%	50%	50%	35%	35%	65%
14	General or Speciality Retailing	45%	71%	29%	20%	50%	50%	35%	35%	65%
15	Health Care, Pharmaceuticals and Biotechnology	65%	62%	38%	25%	50%	50%	10%	35%	65%
16	Hospitality Services	55%	60%	40%	15%	50%	50%	30%	35%	65%
17	Metals & Mining	65%	92%	8%	5%	50%	50%	30%	35%	65%
18	Oil, Gas & Consumable Fuels	65%	93%	7%	5%	50%	50%	30%	35%	65%
19	Professional Services, Software, Real Estate, Financial Institutions	40%	70%	30%	40%	50%	50%	20%	35%	65%
20	Paper & Forest Product Production	65%	73%	27%	15%	50%	50%	20%	35%	65%
21	Textiles, Apparel & Luxury Good Production	55%	71%	29%	30%	50%	50%	15%	35%	65%
22	Transportation Services	65%	89%	11%	20%	50%	50%	15%	35%	65%
23	Water utilities / Water Service Providers	70%	62%	38%	25%	50%	50%	5%	35%	65%
24	Telecommunications	50%	90%	10%	30%	50%	50%	20%	35%	65%
25	Other	50%	60%	40%	15%	50%	50%	35%	35%	65%

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