# S1 Table. Line-up of literature used to conceptualise the BBN model

|  |  |
| --- | --- |
| Model nodes | Literature(s) |
| Season -Rainfall intensity | [1] |
| Season-cloudy days | [1] |
| Season-Wind speed | BMKG |
| Season-Number of active cages | Interview |
| Rainfall intensity-SSI | [2,3] |
| Rainfall intensity-Organic sediment run-off | (Ministry of Public Work. 2013) |
| Cloudy days-Light intensity |  |
| Light intensity-SSI | [5] |
| Light intensity-DO epilimnion | [6] |
| Light intensity-DO metalimnion | [6,7] |
| SSI-Mixing | [3] |
| Water transparency-Light intensity | [8] |
| Wind speed-Water current velocity  | [9,10] |
| Wind speed-Mixing | [11] |
| Wind direction-Mixing | [4,11] |
| Water current velocity-Accumulated feed waste | [5] |
| Mixing-Epilimnion zone after mixing | [12] |
| Mixing-Mass fish kills | [13,14] |
| Mixing-*Gobiopterus* disappearance | Interview |
| Epilimnion zone after mixing- Mass fish kills | [14] |
| Epilimnion zone after mixing- *Gobiopterus* disappearance | Interview  |
| Anoxic layer- Epilimnion zone after mixing | [5,15] |
| DO epilimnion-DO metalimnion | [16] |
| DO epilimnion-GPP epilimnion | [17] |
| DO metalimnetic-GPP metalimnion | [17] |
| H2S-Mass fish kills | [18–20] |
| H2S -*Gobiopterus* disappearance | [18], interview |
| Fe concentration- H2S | [20–22] |
| Fe concentration- PO4 Released from sediment | [20,22,23] |
| Anoxic hypolimnion- PO4 Released from sediment | [22,24,25] |
| Anoxic hypolimnion- H2S | [24] |
| PO4 Released from sediment- PO4 concentration epilimnion | [20] |
| PO4 Released from sediment- Chlo-a epilimnion  | [20] |
| PO4 Released from sediment- Chlo-a metalimnion | [20] |
| BOD epilimnion-DO epilimnion | [26] |
| BOD metalimnion-DO metalimnion | [26] |
| PO4 concentration epilimnion- Chlo-a epilimnion | [27,28] |
| GPP epilimnion-Anoxic layer | [29] |
| GPP metalimnion-Anoxic layer | [29] |
| Chlo-a epilimnion-Water transparency | [15] |
| Chlo-a epilimnion-DO epilimnion | [30,31] |
| Chlo-a metalimnion-DO metalimnion | [30,31] |
| Chlo-a metalimnion-BOD epilimnion | [32,33] |
| Chlo-a metalimnion-BOD metalimnion | [32,33] |
| Chlo-a metalimnion-Respiration rate metalimnion | [34,35]  |
| Respiration rate epilimnion-GPP epilmnion | [29,36] |
| Respiration rate metalimnion-GPP metalimnion | [29,36] |
| Accumulated feed waste-BOD epilimnion | [37] |
| Accumulated feed waste-BOD metalimnion | [37] |
| Organic sediment run off-PO4 concentration epilimnion | [4,38] |
| Organic sediment run off-BOD epilimnion | (Ministry of Public Work 2013) |
| Organic sediment run off-BOD metalimnion | [4,38] |
| Feeding management-feed | [39] |
| Stocking density-Respiration rate epilimnion | [40] |
| Stocking density-Feed | [39] |
| Number of active cages-feed | Interview |
| Feed-Accumulated feed waste | [41] |

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# S2 Table. Table of the variable correlation used to conceptualise the model

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Parameters | Model Nodes | Node type | Physical factors   | Chemical factors  | Biological factors | Antropogenic factors | Output |
| S | RI | CD | LI | SSI | WT | WS | WD | WCV | MIX | EZM | AL | AH | DOe | DOm | H2S | Fe | PO4 | BODep | BODmet | Poe | GPPep | GPPmet | Chlo-a ep | Chlo-a met | RRep | RRmet | AFW | OSR | FM | SD | NAC | Feed | MFK | GD |
| Physical factors | Season (S) | Parent |   | ++ | ++ | + | + | + | ++ | 0 | + | + | + | + | 0 | + | + | 0 | 0 | 0 | 0 | 0 | 0 | + | + | + | + | + | + | + | ++ | 0 | ++ | ++ | + | + | + |
| Rainfall intensity (RI) | Child | 0 |   | 0 | + | ++ | + | 0 | 0 | 0 | 0 | + | + | 0 | + | + | 0 | 0 | 0 | 0 | 0 | + | + | + | + | + | + | + | + | ++ | 0 | + | + | + | + | + |
| Cloudy days (CD) | Child | 0 | + |   | ++ | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | 0 | 0 | 0 | 0 | 0 | 0 | + | + | + | + | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Light Intensity (LI) | Child | 0 | 0 | 0 |   | ++ | + | 0 | 0 | 0 | + | 0 | 0 | 0 | ++ | ++ | 0 | 0 | 0 | 0 | 0 | 0 | + | + | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Schdmidt Stability Index (SSI) | Child | 0 | 0 | 0 | 0 |   | 0 | 0 | 0 | 0 | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water transparency (WT) | Child | 0 | 0 | 0 | ++ | + |   | 0 | 0 | 0 | + | 0 | + | 0 | + | + | 0 | 0 | 0 | 0 | 0 | 0 | + | + | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 |
| Wind speed (WS) | Child | 0 | + | + | 0 | 0 | 0 |   | 0 | ++ | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 | 0 | 0 | 0 | + | + |
| Wind Direction (WD) | Parent | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   | 0 | 0 | 0 | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | + | 0 | 0 | 0 | 0 | ++ | 0 |
| Water current velocity (WCV) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | + | 0 | 0 | 0 | 0 | 0 | 0 |
| Mixing (MIX) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   | 0 | + | 0 | 0 | + | + | + | + | + | + | + | + | + | + | + | 0 |   | 0 | 0 | 0 | + | + | 0 | ++ | ++ |
| Epilimnion zone after mixing (EZM) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | ++ |
| Anoxic layer (AL) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ |   | 0 | + | + | 0 | 0 | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + |
| Anoxic Hypolimnion (AH) | Parent | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 0 | 0 | + | ++ | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chemical factors | DO epilimnion (DOe) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | 0 |   | + | 0 | 0 | 0 | + | + | 0 | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | ++ | ++ | 0 | 0 | 0 |
| DO metalimnetic (DOm) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 |   | + | 0 | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | ++ | 0 | 0 | 0 | 0 | 0 | 0 | ++ | + |
| H2S | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   | 0 | ++ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ++ | ++ |
| Fe concentration (Fe) | Parent | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- |   | -- | 0 | 0 | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PO4 Released from sediment (PO4) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   | 0 | 0 | ++ | + | + | + | ++ | + | + | 0 | 0 | 0 | 0 | 0 | 0 | + | + |
| BOD epilimnion (BODep)  | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | 0 | -- | - | 0 | 0 | 0 |   | 0 | 0 | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BOD metalimnion (BODmet)  | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | 0 | - | -- | 0 | 0 | 0 | 0 |  | 0 | 0 | + | 0 | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + |
| PO4 concentration epilimnion (POe) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | + | + | 0 | 0 | 0 | 0 | 0 |   | + | + | ++ | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Biological factors | GPP epilimnion (GPPep) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | ++ | 0 | + | + | 0 | 0 | + | + | + | 0 |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GPP metalimnion(GPPmet) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | ++ | 0 | 0 | + | 0 | 0 | + | + | + | 0 | 0 |   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chlo-a epilimnion (Chlo-a ep) | Child | 0 | 0 | 0 | 0 | 0 | ++ | 0 | 0 | 0 | 0 | + | + | 0 | ++ | + | 0 | 0 | 0 | ++ | + | + | ++ | + |   | 0 | + | + | 0 | 0 | + | 0 | 0 | + | + | + |
| Chlo-a metalimnion (Chlo-a met) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | ++ | 0 | 0 | 0 | ++ | ++ | 0 | + | + | 0 |   | + | + | 0 | 0 | + | 0 | 0 | 0 | + | + |
| Respiration rate epilimnion (RRep) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 0 | -- | - | 0 | 0 |   | + | 0 | 0 | 0 | 0 | 0 | 0 | + | + |
| Respiration rate metalinion (RRmet) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | -- | 0 | 0 | 0 | 0 | 0 | 0 | + | ++ | 0 | 0 | 0 |   | 0 | 0 | 0 | 0 | 0 | 0 | + | + |
| Antropogenic factors | Accumulated fish waste (AFW) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | + | + | -- | -- | - | - | -- | ++ | ++ | + | - | - | + | + | 0 | 0 |   | 0 | -- | -- | 0 | 0 | + | + |
| Organic sediment run off (OSR) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | -- | -- | 0 | 0 | 0 | ++ | ++ | ++ | - | - | + | + | 0 | 0 | 0 |   | 0 | 0 | 0 | 0 | + | + |
| Feeding management (FM) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | 0 | + | + | 0 | 0 | + | + | + | + | 0 | 0 | + | + | 0 | 0 | ++ | 0 |   | 0 | 0 | ++ | + | + |
| Stocking density (SD) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | + | 0 | 0 | + | + | + | + | + | + | + | + | ++ | + | + | 0 | + |   | + | ++ | + | 0 |
| Number of active cages (NAC) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | 0 | + | + | 0 | 0 | + | ++ | ++ | + | ++ | ++ | + | + | ++ | ++ | ++ | 0 | ++ | ++ |   | ++ | + | + |
| Feed | Child | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 | 0 | 0 | + | + | 0 | 0 | 0 | 0 | 0 | + | + | + | + | 0 | 0 | + | + | 0 | 0 | ++ | 0 | 0 | 0 | 0 |   | + | + |
| Output | IWCCF Fish Mass fish kills (MFK) | Child | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + | - | + | + | 0 | 0 | + | + | + | + | + | + | + | + | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |   | + |
| *Gobiopterus* disappearance (GD) | Outcome | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |

# S3 Table. Methods to fill CPTs, CPTs before and after being compiled

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Node | Type of Node | Method to fill CPT Tables | Data Source (s) | Type of data in CPT (Chance (%)/ deterministic) | CPT before being compiled | CPT after being compiled |
| Season | Parent | Data  | BMKG data (2000-2010) | Chance  | 16.783.3 | 16.783.3 |
| Rainfall intensity | Child | Data  | BMKG data (2000-2010) (n=3,650) | Chance | Dry season: No rain: 76Light rain 3Moderate rain: 6Heavy rain: 15 | No rain: 52.7Light rain 10.5Moderate rain:9.33Heavy rain:27.5 |
| Wet seasonNo rain:48 Light rain:12Moderate rain:10Heavy rain:30 |
| Cloudy | Child | Data  | BMKG data (2000-2010) | Chance | Dry Season:Yes:20No:80 | Yes: 70No:30 |
| Wet season:Yes:80No:20 |
| Light intensity | Child | Expert knowledge  | Based on solar radiation data from BMKG (2000-2010) | Chance | Cloudy (Yes)-Water transparency (Low):High: 30, Medium:35; Low:35 | High: 51.2Medium:38Low:10.8 |
| Cloudy (Yes)-Water transparency (High): High:45, Medium:50, Low:5 |
| Cloudy (No)-Water transparency (Low): High:45, Medium:45, Low:10 |
| Cloudy (No)-Water transparency (High): High:90, Medium:10, Low:0 |
| Windspeed | Child | Data  | BMKG data (2000-2010) (n=3,650) | Chance | Dry season:Calm:42.3Moderate:19Strong:25.4Gale-storm:13.3 | Calm: 52.6Moderate: 18.2Strong:20Gale-storm:9.22 |
| Wet season:Calm: 54.7Moderate: 18Strong: 18.9Gale-storm:8.4 |
| Mixing | Child | Expert knowledge  | Based on criteria of environmental condition to trigger upwelling from Ministry of Marine and Fisheries verified with data from Fisheries Agency and RCL-IIOS  | Chance | SSI (High)-Windspeed (calm): Yes:0, No:100 | Yes: 24.1No:75.9 |
| SSI (High)-Windspeed (moderate): Yes:15, No:85 |
| SSI (High)-Windspeed (strong): Yes:40, No:60 |
| SSI (High)-Windspeed (Gale-storm): Yes:50, No:50 |
| SSI (Medium)-Windspeed (calm): Yes:15, No:85 |
| SSI (Medium)-Windspeed (Moderate): Yes:30, No:70 |
| SSI (Medium)-Windspeed (Strong): Yes:30, No:70 |
| SSI (Medium)-Windspeed (Gale-storm): Yes:50, No:50 |
| SSI (Low)-Windspeed (calm): Yes:20, No:80 |
| SSI (Low)-Windspeed (moderate): Yes:45, No:55 |
| SSI (Low)-Windspeed (moderate): Yes:45, No:55 |
| SSI (Low)-Windspeed (strong): Yes:65, No:35 |
| SSI (Low)-Windspeed (Gale-storm): Yes:100, No:0 |
| Wind Direction | Parent | Data  | RCL-IIOS data (2018) (n=10,926) | Chance | North:4.8, NorthEast:21.8, East:36.3, SouthEast:0, Other direction:37.1 | North:4.8NorthEast:21.8East:36.3, SouthEast:0Other direction:37.1 |
| Water transparency | Child | Data  | RCL-IIOS and Setiawan *et al*.(2019) | Chance | Chlorophyll-a (High): Low:24, High:76 | Low: 30.3High:69.7 |
| Chlorophyll-a (Medium): Low:52, High:48 |
| Chlorophyll-a (Medium): Low:15, High:85 |
| Anoxic layer | Child | Expert knowledge  | Based on data RCL-IIOS’s dissolved oxygen data (2001-2014) | Chance | GPP epilimnion (High)-GPP Metalimnion (High): wide: 0, narrow: 100 | wide: 74narrow: 26 |
| GPP epilimnion (High)-GPP Metalimnion (Low): wide: 60, narrow: 40 |
| GPP epilimnion (High)-GPP Metalimnion (Low): wide: 50, narrow: 50 |
| GPP epilimnion (High)-GPP Metalimnion (Low): wide: 1000, narrow: 0 |
| Epilimnion zone after mixing | Child | Expert knowledge |  | Chance | Anoxic layer (wide)-Mixing(yes): Anoxic:100, Oxic:0 | Anoxic:21Oxic:79 |
| Anoxic layer (wide)-Mixing(no): Anoxic:0, Oxic:100 |
| Anoxic layer (Narrow)-Mixing (Yes): Anoxic:50, Oxic:50 |
| Anoxic layer (Narrow)-Mixing (no): Anoxic:0, Oxic:100 |
| SSI | Child | Data  | Calculated from high frequency measurement data by RCL-IIOS (2014-2017) (n=540) | Chance | Light intensity (High)-Rainfall intensity (No rain): High:100, Medium:0, Low:0 | High:50.3, Medium:23.2Low:26.5 |
| Light intensity (High)-Rainfall intensity (moderate rain): High:0, Medium:50, Low:50 |
| Light intensity (High)-Rainfall intensity (Heavy rain): High:0, Medium:30, Low:70 |
| Light intensity (Medium)-Rainfall intensity (No rain): High:60, Medium:40, Low:0 |
| Light intensity (Medium)-Rainfall intensity (Light rain): High:70, Medium:30, Low:0 |
| Light intensity (Medium)-Rainfall intensity (Moderate rain): High:0, Medium:40, Low:60 |
| Light intensity (Medium)-Rainfall intensity (Heavy rain): High:0, Medium:20, Low:80 |
| Light intensity (Low)-Rainfall intensity (No rain): High:50, Medium:50, Low: 0 |
| Light intensity (Low)-Rainfall intensity (light rain): High:50, Medium:50, Low: 0 |
| Light intensity (Low)-Rainfall intensity (moderate rain): High:0, Medium:30, Low: 70 |
| Light intensity (Low)-Rainfall intensity (Heavy rain): High:0, Medium:0, Low: 100 |
| Water current velocity | Child | Data  | RCL-IIOS combined with data from BMKG | Chance | Windspeed (Calm): fast:5, Medium:15, Slow:80 | Fast:30.6Medium:14.6Slow:54.8 |
| Windspeed (Calm): fast:15, Medium:15, Slow:70 |
| Windspeed (Calm): fast:80, Medium:20, Slow:10 |
| Windspeed (Calm): fast:100, Medium:0, Slow:0 |
| Anoxic hypolimnion | Child | Expert knowledge  | Based on Henny and Sulung Nomosatryo (2012) Sulastri (2002) | Chance | Yes:90No:10 | Yes:90No:10 |
| BOD epilimnion | Child | Expert knowledge  | Based on patchy data from Ministry of Public Works and Erlania,Prasetio, & Joni (2010) | Chance | Organic sediment run-off (High)-Accumulated fish waste (High)-Chlo-a metalimnion (High): High:100, Low:0 | High:73.7Low:26.3 |
| Organic sediment run-off (High)-Accumulated fish waste (Low)-Chlo-a metalimnion (High): High:75, Low:25 |
| Organic sediment run-off (High)-Accumulated fish waste (Low)-Chlo-a metalimnion (Low): High:60, Low:40 |
| Organic sediment run-off (Medium)-Accumulated fish waste (Low)-Chlo-a metalimnion (Low): High:90, Low:10 |
| Organic sediment run-off (Medium)-Accumulated fish waste (High)-Chlo-a metalimnion (Low): High:85, Low:15 |
| Organic sediment run-off (Medium)-Accumulated fish waste (Low)-Chlo-a metalimnion (High): High:75, Low:25 |
| Organic sediment run-off (Medium)-Accumulated fish waste (Low)-Chlo-a metalimnion (Low): High:60, Low:40 |
| Organic sediment run-off (Low)-Accumulated fish waste (High)-Chlo-a metalimnion (High): High:85, Low:15 |
| Organic sediment run-off (Low)-Accumulated fish waste (High)-Chlo-a metalimnion (Low): High:60, Low:40 |
| Organic sediment run-off (Low)-Accumulated fish waste (Low)-Chlo-a metalimnion (High): High:65, Low:35 |
| Organic sediment run-off (Low)-Accumulated fish waste (Low)-Chlo-a metalimnion (Low): High:20, Low:80 |
| PO4 Concentration Epilimnion | Child | Expert knowledge  | Based on patchy data of Total Phosphate data from RCL-IIOS (2001-2014) | Chance | Organic sediment run-off (High)-PO4 released from sediment (High): High:60, Low: 40 | High:52Low:48 |
| Organic sediment run-off (High)-PO4 released from sediment Low): High:40, Low:60 |
| Organic sediment run-off (Medium)-PO4 released from sediment (High): High:40, Low:60 |
| Organic sediment run-off (Medium)-PO4 released from sediment (Low): High:40, Low:60 |
| Organic sediment run-off (Low)-PO4 released from sediment (High): High:60, Low:40 |
| Organic sediment run-off (Low)-PO4 released from sediment (Low): High:10, Low:90 |
| Chlo-a epilimnion | Child | Data  | RCL-IIOS (2001-2014), Henny and Sulung Nomosatryo (2012) | Chance | PO4 Concentration epilimnion (High)-PO4 released from sediment (High): High:80, Medium:15, Low:5 | High:75.8Medium:12.9Low:11.4 |
| PO4 Concentration epilimnion (High)-PO4 released from sediment (Low): High:80, Medium:15, Low:5 |
| PO4 Concentration epilimnion (Low)-PO4 released from sediment (High): High:80, Medium:10, Low:10 |
| PO4 Concentration epilimnion (Low)-PO4 released from sediment (Low): High:5, Medium:15, Low:80 |
| Respiration rate epilimnion | Child | Expert knowledge  | Based on one-time data measurement from RCL-IIOS |  | Stocking density (High): High:90, Low:10 | High:63.7Low:36.3 |
| Stocking density (Medium): High:70, Low:30 |
| Stocking density (Low): High:50, Low:50 |
| Respiration rate metalimnion | Child | Expert knowledge  | Based on one-time data measurement from RCL-IIOS | Chance | Chlo-a metalimnion (High): High: 80, Low:20 | High: 50Low:50 |
| Chlo-a metalimnion (Low): High: 20, Low:80 |
| BOD metalimnion | Child | Expert knowledge  | Based on the paper of Junaidi, Syandri, and Azrita (2014); Erlania,Prasetio, & Joni (2010); Ministry of Public Work (2013) | Chance | Chlo-a metalimnion (High)-Organic sediment runoff (High)- Accumulated fish waste (High): High:100, Low:0 | High:75.2Low:24.6 |
| Chlo-a metalimnion (High)-Organic sediment runoff (High)- Accumulated fish waste (Low): High:75, Low:25 |
| Chlo-a metalimnion (High)-Organic sediment runoff (Medium)- Accumulated fish waste (High): High:90, Low:10 |
| Chlo-a metalimnion (High)-Organic sediment runoff (Medium)- Accumulated fish waste (Low): High:75, Low:25 |
| Chlo-a metalimnion (High)-Organic sediment runoff (Low)- Accumulated fish waste (Low): High:80, Low:20 |
| Chlo-a metalimnion (Low)-Organic sediment runoff (High)- Accumulated fish waste (High): High:75, Low:25 |
| Chlo-a metalimnion (Low)-Organic sediment runoff (High)- Accumulated fish waste (Low): High:60, Low:40 |
| Chlo-a metalimnion (Low)-Organic sediment runoff (Medium)- Accumulated fish waste (High): High:85, Low:15 |
| Chlo-a metalimnion (Low)-Organic sediment runoff (Medium)- Accumulated fish waste (Low): High:60, Low:40 |
| Chlo-a metalimnion (Low)-Organic sediment runoff (Low)- Accumulated fish waste (High): High:80, Low:20 |
| Chlo-a metalimnion (Low)-Organic sediment runoff (Low)- Accumulated fish waste (Low): High:20, Low:80 |
| PO4 Released from hypolimnion | Child | Expert knowledge  | Based on the paper of Henny and Sulung Nomosatryo (2012) and Nikolai & Dzialowski (2014) | Chance | Fe2+ concentration (Low)-Anoxic hypolimnion (yes): High:100, Low:0 | High:92Low:8 |
| Fe2+ concentration (Low)-Anoxic hypolimnion (no): High:20, Low:80 |
| Reactive Fe (Fe2+) Concentration | Parent | Expert knowledge  | Based on the paper of Henny and Sulung Nomosatryo (2012) | Deterministic | Low | Low |
| Chlo-a metalimnion | Child | Expert knowledge  | Based on Henny and Sulung Nomosatryo (2012) | Chance | PO4 released from hypolimnion (High): High:80. Low: 20 | High: 75.2Low: 25.8 |
| PO4 released from hypolimnion (Low): High:20. Low: 80 |
| H2S | Child | Data  | Sugiarti, Sutamihardja, and Citroreksoko (2011) | Chance | Fe2+ concentration (Low)-Anoxic hypolimnion (yes): High:0, Low:0 | High:93Low:7 |
| Fe2+ concentration (Low)-Anoxic hypolimnion (no): High:30, Low70 |
| GPP epilimnion | Child | Expert knowledge  | Based on one-time data measurement from RCL-IIOS | Chance | Respiration rate epilimnion (High)-DO epilimnion (High): High:50, Low:50 | High:42.8Low:57.2 |
| Respiration rate epilimnion (High)-DO epilimnion (Medium): High:30, Low:70 |
| Respiration rate epilimnion (High)-DO epilimnion (Low): High:10, Low:90 |
| Respiration rate epilimnion (Low)-DO epilimnion (High): High:90, Low:10 |
| Respiration rate epilimnion (Low)-DO epilimnion (Medium): High:70, Low:30 |
| Respiration rate epilimnion (Low)-DO epilimnion (Low): High:20, Low:80 |
| GPP metalimnion | Child | Expert knowledge  | Based on one-time data measurement from RCL-IIOS | Chance | Respiration rate metalimnion (High)-DO metalimnion (High): High:70, Low:30 | High: 23.9Low:76.1 |
| Respiration rate metalimnion (High)-DO metalimnion (Very low): High: 0, Low:100 |
| Respiration rate metalimnion (High)-DO metalimnion (Medium): High:50, Low:50 |
| Respiration rate metalimnion (High)-DO metalimnion (Low): High:50, Low:50 |
| Respiration rate metalimnion (High)-DO metalimnion (Low): High:10, Low:90 |
| Respiration rate metalimnion (Low)-DO metalimnion (High): High:80, Low:20 |
| Respiration rate metalimnion (Low)-DO metalimnion (Very Low): High:0, Low:100 |
| Respiration rate metalimnion (Low)-DO metalimnion (Medium): High:30, Low:70 |
| Respiration rate metalimnion (Low)-DO metalimnion (Low): High:0, Low:100 |
| DO epilimnion | Child | Expert knowledge  | Based on data from RCL-IIOS (2005-2018) | Chance | Light intensity (High)-Chlo-a epilimnion (High)-BOD epilimnion (High): High: 40, Medium:30, Low: 30 | High: 41.4Medium:26.3Low: 32.3 |
| Light intensity (High)-Chlo-a epilimnion (High)-BOD epilimnion (Low): High: 90, Medium: 5, Low: 5  |
| Light intensity (High)-Chlo-a epilimnion (Medium)-BOD epilimnion (High): High: 40, Medium: 30, Low: 30 |
| Light intensity (High)-Chlo-a epilimnion (Medium)-BOD epilimnion (Low): High: 60, Medium: 30, Low: 10 |
| Light intensity (High)-Chlo-a epilimnion (Low)-BOD epilimnion (High): High: 10, Medium: 20, Low: 70 |
| Light intensity (High)-Chlo-a epilimnion (Low)-BOD epilimnion (Low): High: 80, Medium: 10, Low: 10 |
| Light intensity (Medium)-Chlo-a epilimnion (High)-BOD epilimnion (High): High: 30, Medium: 30, Low: 40 |
| Light intensity (Medium)-Chlo-a epilimnion (High)-BOD epilimnion (Low): High: 70, Medium: 20, Low: 10 |
| Light intensity (Medium)-Chlo-a epilimnion (Medium)-BOD epilimnion (High): High: 40, Medium: 40, Low: 20 |
| Light intensity (Medium)-Chlo-a epilimnion (Medium)-BOD epilimnion (Low): High: 50, Medium: 30, Low: 20 |
| Light intensity (Medium)-Chlo-a epilimnion (Low)-BOD epilimnion (High): High: 10, Medium: 10, Low: 80 |
| Light intensity (Medium)-Chlo-a epilimnion (Low)-BOD epilimnion (Low): High: 70, Medium: 20, Low: 10 |
| Light intensity (Low)-Chlo-a epilimnion (High)-BOD epilimnion (High): High: 15, Medium: 25, Low: 60 |
| Light intensity (Low)-Chlo-a epilimnion (High)-BOD epilimnion (Low): High: 20, Medium: 40, Low: 40 |
| Light intensity (Low)-Chlo-a epilimnion (Medium)-BOD epilimnion (High): High: 10, Medium: 20, Low: 70 |
| Light intensity (Low)-Chlo-a epilimnion (Medium)-BOD epilimnion (Low): High: 10, Medium: 20, Low: 70 |
| Light intensity (Low)-Chlo-a epilimnion (Low)-BOD epilimnion (High): High: 80, Medium: 10, Low: 10 |
| Light intensity (Low)-Chlo-a epilimnion (Medium)-BOD epilimnion (Low): High: 10, Medium: 20, Low: 70 |
| Light intensity (Low)-Chlo-a epilimnion (Low)-BOD epilimnion (Low): High: 10, Medium: 10, Low: 80 |
| DO metalimnion | Child | Expert knowledge  | Based on data from RCL-IIOS (2005-2018) | Chance | Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (High)-DO epilimnion (High): High :10, Very Low :5, Medium :20, Low :65 | High:16.7Medium:19.0Low:59.0Very Low:5.26 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (High)-DO epilimnion (Medium): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (High)-DO epilimnion (Low): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (Medium)-DO epilimnion (High): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (Medium)-DO epilimnion (Medium): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (Medium)-DO epilimnion (Low): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (Low)-DO epilimnion (High): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (Low)-DO epilimnion (High): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (High)-Light intensity (Low)-DO epilimnion (Low): High :10, Very Low :5, Medium :20, Low :65 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (High)-DO epilimnion (High): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (High)-DO epilimnion (Medium): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (High)-DO epilimnion (Low): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (Medium)-DO epilimnion (High): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (Medium)-DO epilimnion (Medium): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (Medium)-DO epilimnion (Low): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (Low)-DO epilimnion (High): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (Low)-DO epilimnion (Medium): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (High)-BOD Metalimnion (Low)-Light intensity (Low)-DO epilimnion (Low): High :90, Very Low :0, Medium :10, Low :0 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (High)-DO epilimnion (High): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (High)-DO epilimnion (Medium): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (High)-DO epilimnion (Low): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (Medium)-DO epilimnion (High): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (Medium)-DO epilimnion (Low): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (Low)-DO epilimnion (High): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (Low)-DO epilimnion (Medium): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (High)-Light intensity (Low)-DO epilimnion (Low): High :0, Very Low :10, Medium :10, Low :80 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (High)-DO epilimnion (High): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (High)-DO epilimnion (Medium): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (High)-DO epilimnion (Low): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (Medium)-DO epilimnion (High): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (Medium)-DO epilimnion (Medium): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (Medium)-DO epilimnion (Low): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (Low)-DO epilimnion (High): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (Low)-DO epilimnion (Medium): High :5, Very Low :5, Medium :40, Low :50 |
| Chlorophyll-a metalimnion (Low)-BOD Metalimnion (Low)-Light intensity (Low)-DO epilimnion (Low): High :5, Very Low :5, Medium :40, Low :50 |
| Stocking density | Child | Expert knowledge | Interview with IWCC farmers and staffs of Fisheries Agency | Chance | Dry season:High:20Medium:70Low:10 | High:11.7Medium:45.0Low:43.3 |
| Wet season:High:10Medium:40Low:50 |
| Number of active cages | Child | Expert knowledge | Interview with staffs of Fisheries Agency and data from Fisheries Agency | Chance | Dry season:Zero: 0, Low: 5Medium: 10, High: 85 | Zero:4.16Low:17.5Medium:22.5High: 55.8 |
| Wet seasonZero: 5, Low: 20Medium: 25, High:50 |
| Feeding management | Parent | Data  | Interview with IWCC farmers and Erlania *et al*. (2010) | Chance | Twice Floating:40None:5Twice emerged:10One Floating:35One emerged:10 | Twice Floating:40None:5Twice emerged:10One Floating:35One emerged:10 |
| Organic sediment run off | Child | Expert knowledge  | Validated with Marganof (2007) and Ministry of Public Work report (2013) | Chance | Rainfall intensity (No rain):High: 25, Medium: 25, Low: 50 | High: 33.8Medium: 30.1Low: 36.1 |
| Rainfall intensity (Light rain):High: 30, Medium: 30, Low: 40 |
| Rainfall intensity (Moderate rain):High: 40, Medium: 30, Low: 30 |
| Rainfall intensity (Heavy rain):High: 50, Medium: 40, Low: 10 |
| Feed | Child | Expert knowledge  | Based on the paper by Erlania,Prasetio, & Joni (2010) evaluated with interview results with IWCC farmers | Chance | Number of active cages (Zero)-Stocking density (Low-High)-Feeding management (None-Twice floating): High:0, Medium:0, Low:100 | High: 63.3Medium: 12.9Low: 23.8 |
| Number of active cages (Low)-Stocking density (High)-Feeding management (Twice floating): High:60, Medium:20, Low:20 |
| Number of active cages (Low)-Stocking density (High)-Feeding management (None): High:0, Medium:0, Low:100 |
| Number of active cages (Low)-Stocking density (High)-Feeding management (Twice emerge): High:60, Medium:20, Low:20 |
| Number of active cages (Low)-Stocking density (High)-Feeding management (One floating): High:10, Medium:10, Low:80 |
| Number of active cages (Low)-Stocking density (Medium)-Feeding management (Twice floating): High:25, Medium:15, Low:60 |
| Number of active cages (Low)-Stocking density (Medium)-Feeding management (One floating): High:10, Medium:10, Low:80 |
| Number of active cages (Low)-Stocking density (Medium)-Feeding management (One emerge): High:10, Medium:10, Low:80 |
| Number of active cages (Low)-Stocking density (Low)-Feeding management (Twice floating): High:10, Medium:25, Low:65 |
| Number of active cages (Low)-Stocking density (Low)-Feeding management (None): High:0, Medium:0, Low:100 |
| Number of active cages (Low)-Stocking density (Low)-Feeding management (Twice emerge): High:25, Medium:15, Low:60 |
| Number of active cages (Low)-Stocking density (Low)-Feeding management (One floating): High:10, Medium:20, Low:70 |
| Number of active cages (Medium)-Stocking density (Low-High)-Feeding management (None-Twice emerge): High:0-80, Medium:0-20, Low:0-100 |
| Number of active cages (High)-Stocking density (Low-High)-Feeding management (None-Twice emerge): High:0-100, Medium:0-20, Low:0-100 |
| Accumulated fish feed | Child | Expert knowledge  | Based on the paper of Junaidi, Syandri, and Azrita (2014) |  | Feed (High)-Water current velocity (Fast)High: 60, Low:40 | High: 57.8Low: 42.2 |
| Feed (High)-Water current velocity (Medium)High: 50, Low:50 |
| Feed (High)-Water current velocity (Slow)High: 40, Low:60 |
| Feed (Medium)-Water current velocity (Fast)High: 75, Low:25 |
| Feed (Medium)-Water current velocity (Medium)High: 65, Low:35 |
| Feed (Medium)-Water current velocity (Slow)High: 55, Low:45 |
| Feed (Low)-Water current velocity (Fast)High: 95, Low:5 |
| Feed (Low)-Water current velocity (Medium)High: 85, Low:15 |
| Feed (Low)-Water current velocity (Slow)High: 75, Low:25 |
| *Gobiopterus* disappearance | Child | - |  |  |  |  |
| Mass fish kills | Child | - |  |  |  |  |

# S4 Table. Outcomes of the model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scenario | Season | State | MFK | G.disappearance |
| 1a | Business as usual | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 1.77 | 10.9 |
| 1a | Business as usual | Dry  | Calm wind-No Rain-Wind Dir (others) | 5.21 | 10.9 |
| 1a | Business as usual | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 2.43 | 11.46 |
| 1a | Business as usual | Dry  | Calm wind-Light Rain-Wind Dir others) | 5.43 | 11.46 |
| 1a | Business as usual | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 17 | 25.2 |
| 1a | Business as usual | Dry  | Calm wind-Moderate Rain-Wind Dir (others) | 10.1 | 25.2 |
| 1a | Business as usual | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 32 | 89 |
| 1a | Business as usual | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 85.5 | 89 |
| 1a | Business as usual | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 55 | 60.6 |
| 1a | Business as usual | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 22.2 | 60.6 |
| 1a | Business as usual | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 47.9 | 54 |
| 1a | Business as usual | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 20 | 54 |
| 1a | Business as usual | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 75.3 | 79.5 |
| 1a | Business as usual | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 28.7 | 79.5 |
| 1b | Without IWCCF | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 0 | 10.9 |
| 1b | Without IWCCF | Dry  | Calm wind-No Rain-Wind Dir (others) | 0 | 10.9 |
| 1b | Without IWCCF | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 0 | 11.46 |
| 1b | Without IWCCF | Dry  | Calm wind-Light Rain-Wind Dir others) | 0 | 11.46 |
| 1b | Without IWCCF | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 0 | 25.2 |
| 1b | Without IWCCF | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 0 | 25.2 |
| 1b | Without IWCCF | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 0 | 89 |
| 1b | Without IWCCF | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 0 | 89 |
| 1b | Without IWCCF | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 0 | 60.6 |
| 1b | Without IWCCF | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 0 | 60.6 |
| 1b | Without IWCCF | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 0 | 54 |
| 1b | Without IWCCF | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 0 | 54 |
| 1b | Without IWCCF | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 0 | 79.5 |
| 1b | Without IWCCF | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 0 | 79.5 |
| 1c | With 6,000 IWCCF | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 1.77 | 10.9 |
| 1c | With 6,000 IWCCF | Dry  | Calm wind-No Rain-Wind Dir (others) | 5.21 | 10.9 |
| 1c | With 6,000 IWCCF | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 2.43 | 11.46 |
| 1c | With 6,000 IWCCF | Dry  | Calm wind-Light Rain-Wind Dir others) | 5.43 | 11.46 |
| 1c | With 6,000 IWCCF | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 17 | 25.2 |
| 1c | With 6,000 IWCCF | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 10.1 | 25.2 |
| 1c | With 6,000 IWCCF | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 32 | 89 |
| 1c | With 6,000 IWCCF | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 85.5 | 89 |
| 1c | With 6,000 IWCCF | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 55 | 60.6 |
| 1c | With 6,000 IWCCF | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 22.2 | 60.6 |
| 1c | With 6,000 IWCCF | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 47.9 | 54 |
| 1c | With 6,000 IWCCF | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 20 | 54 |
| 1c | With 6,000 IWCCF | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 75.3 | 79.5 |
| 1c | With 6,000 IWCCF | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 28.7 | 79.5 |
| 1d | With IWCCF and reduction of internal P loading | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 2.72 | 4.56 |
| 1d | With IWCCF and reduction of internal P loading | Dry  | Calm wind-No Rain-Wind Dir (others) | 1.6 | 4.56 |
| 1d | With IWCCF and reduction of internal P loading | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 2.27 | 5.21 |
| 1d | With IWCCF and reduction of internal P loading | Dry  | Calm wind-Light Rain-Wind Dir others) | 3.23 | 5.21 |
| 1d | With IWCCF and reduction of internal P loading | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 16.2 | 18.8 |
| 1d | With IWCCF and reduction of internal P loading | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 13.9 | 18.8 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 30.8 | 33.8 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 23.3 | 33.8 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 71.9 | 72.9 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 35.8 | 51.4 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 35.3 | 38.3 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 26.6 | 38.3 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 54.9 | 57.9 |
| 1d | With IWCCF and reduction of internal P loading | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 40.5 | 57.9 |
| 1e | With IWCCF and aeration | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 0.21 | 9.53 |
| 1e | With IWCCF and aeration | Dry  | Calm wind-No Rain-Wind Dir (others) | 4.74 | 9.53 |
| 1e | With IWCCF and aeration | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 0.29 | 9.62 |
| 1e | With IWCCF and aeration | Dry  | Calm wind-Light Rain-Wind Dir others) | 4.78 | 9.62 |
| 1e | With IWCCF and aeration | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 2.34 | 11.9 |
| 1e | With IWCCF and aeration | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 5.67 | 11.9 |
| 1e | With IWCCF and aeration | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 9.6 | 20.1 |
| 1e | With IWCCF and aeration | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 8.86 | 20.1 |
| 1e | With IWCCF and aeration | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 26 | 38.6 |
| 1e | With IWCCF and aeration | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 16.1 | 38.6 |
| 1e | With IWCCF and aeration | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 12.2 | 23.1 |
| 1e | With IWCCF and aeration | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 10 | 23.1 |
| 1e | With IWCCF and aeration | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 40.1 | 54.5 |
| 1e | With IWCCF and aeration | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 22.2 | 54.5 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 0.2 | 3.23 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Dry  | Calm wind-No Rain-Wind Dir (others) | 1.59 | 3.23 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 0.3 | 3.33 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Dry  | Calm wind-Light Rain-Wind Dir others) | 1.63 | 3.33 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 2.32 | 5.61 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 2.52 | 5.61 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 4.96 | 11.9 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 7.92 | 11.9 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 15.3 | 20.3 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 8.21 | 20.3 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 9.56 | 13.8 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 5.68 | 13.8 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 19.1 | 24.4 |
| 1f | With IWCCF and reduction of internal P loading and aeration  | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 9.84 | 24.4 |
| 2a | Business as usual | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 2.02 | 12.2 |
| 2a | Business as usual | Dry  | Calm wind-No Rain-Wind Dir (others) | 2.73 | 12.2 |
| 2a | Business as usual | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 2.27 | 12.3 |
| 2a | Business as usual | Dry  | Calm wind-Light Rain-Wind Dir others) | 3.24 | 12.3 |
| 2a | Business as usual | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 16.3 | 25.3 |
| 2a | Business as usual | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 14 | 25.3 |
| 2a | Business as usual | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 45.7 | 54 |
| 2a | Business as usual | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 36.5 | 54 |
| 2a | Business as usual | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 56.6 | 79.6 |
| 2a | Business as usual | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 71.9 | 79.6 |
| 2a | Business as usual | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 52.5 | 89 |
| 2a | Business as usual | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 41.7 | 89 |
| 2a | Business as usual | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 81.6 | 60.6 |
| 2a | Business as usual | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 64 | 60.6 |
| 2b | Without IWCCF | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 0 | 4.56 |
| 2b | Without IWCCF | Dry  | Calm wind-No Rain-Wind Dir (others) | 0 | 4.56 |
| 2b | Without IWCCF | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 0 | 5.21 |
| 2b | Without IWCCF | Dry  | Calm wind-Light Rain-Wind Dir others) | 0 | 5.21 |
| 2b | Without IWCCF | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 0 | 18.9 |
| 2b | Without IWCCF | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 0 | 18.9 |
| 2b | Without IWCCF | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 0 | 47.5 |
| 2b | Without IWCCF | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 0 | 47.5 |
| 2b | Without IWCCF | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 0 | 73 |
| 2b | Without IWCCF | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 0 | 73 |
| 2b | Without IWCCF | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 0 | 54.1 |
| 2b | Without IWCCF | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 0 | 54.1 |
| 2b | Without IWCCF | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 0 | 82.5 |
| 2b | Without IWCCF | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 0 | 82.5 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 1.77 | 10.9 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Dry  | Calm wind-No Rain-Wind Dir (others) | 5.21 | 10.9 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 2.43 | 11.46 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Dry  | Calm wind-Light Rain-Wind Dir others) | 5.43 | 11.46 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 17 | 25.2 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 10.1 | 25.2 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 47.9 | 47.4 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 36.4 | 47.4 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 55 | 60.6 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 22.2 | 60.6 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 47.9 | 54 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 20 | 54 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 75.3 | 79.5 |
| 2c | 6,000 IWCCF (no reduction of internal P action, and current feeding management) | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 28.7 | 79.5 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Dry  | Calm wind-No Rain-Wind Dir (N, E, NE) | 0.85 | 0.85 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Dry  | Calm wind-No Rain-Wind Dir (others) | 0.85 | 0.85 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Dry  | Calm wind-Light Rain-Wind Dir (N, E, NE) | 1.22 | 1.22 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Dry  | Calm wind-Light Rain-Wind Dir others) | 1.22 | 1.22 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Dry  | Calm wind-Moderate Rain-Wind Dir (N, E, NE) | 8.83 | 8.83 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Dry  | Calm wind-Moderate Rain-Wind Dir (Others) | 8.83 | 8.83 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Strong wind-Moderate Rain-Wind Dir (N, E, NE) | 24.8 | 24.8 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Strong wind-Moderate Rain-Wind Dir (others) | 24.8 | 24.8 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Strong wind-Heavy Rain-Wind Dir (N, E, NE) | 39 | 39 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Strong wind-Heavy Rain-Wind Dir (others) | 39 | 39 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (N, E, NE) | 28.5 | 28.5 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Gale-storm wind-Moderate Rain-Wind Dir (others) | 28.5 | 28.5 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (N, E, NE) | 44.2 | 44.2 |
| 2d | 6,000 IWCCF (better feeding management and internal P loading control) | Rainy | Gale-storm wind-Heavy Rain-Wind Dir (others) | 44.2 | 44.2 |