**Appendix A. Methodological framework used to develop the decision framework for aquaculture CIS**



**Appendix B. Temperature decision matrix to support fish-farmers’ decision making during grow out phase of four widely cultivated fish species**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Fish-Species | Phase | Month Start  | Month end | MnT Threshold (0C) | MnT Advisory | MxT Threshold (0C) | MxT Advisory |
| Nile Tilapia (*O. niloticus*) | Grow-out | May | November | <20 | Water quality 1. If pond water temperature goes below 200C, it deteriorates pond water quality (i.e., pH and dissolve O2);2. Fish producers who have fishes in their ponds at grow out phase can use aerator or any oxygen promoter aqua-medicine;3. Fish producers can also manage pump to irrigate the pond with ground water;4. Fish producers can restrict lime application;Feeding5. If pond water temperature goes below 200C, it affects food intake behavior of fish;6. Fish-farmers can reduce feeding ratio;Harvesting 7. If fishes show any abnormal behavior like floating near the water level, fish-farmers can reduce fish stock density by partial harvesting | >32 | Water quality1. If pond water temperature goes above 320C, it promotes bacterial decomposition and deteriorates pond water quality (i.e., pH, dissolve O2, NH3, H2S) ;2. Fish producers who have fishes in their ponds at grow out phase can apply lime;3. Can use aerator or any oxygen promoter aqua-medicine;4. Fish producers can also manage pump to irrigate the pond with ground water;5. Can apply Horra pulling to remove toxic gases;6. Also can apply zeolite;Feeding7. Pond water temperature above 320C reduces digestion capacity of fish;8. Fish producers who have fishes in their ponds at grow out phase can stop feeding temporarily during afternoon;9. Also farmers can apply vitamin C supplement during morning time; |
| Rohu *(L. Rohita)* | Grow-out | May | November | <22 | >30 |
| Black tiger shrimp/Bagda*(P. monodon)* | Grow-out | February | June | <25 | >30 |
| Fresh water prawn/Golda*(M. rosenbergii* | Grow-out | July | November | <25 | >30 |

**Appendix C. Rainfall decision matrix to support Fish producers’ decision making during grow out phase of four widely cultivated fish** species

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Fish-Species | Phase | Month Start  | Month end | VHR threshold (mm/day) | VHR Advisory | HR Threshold (mm/day) | HR Advisory | DS threshold (mm/day) | DS Advisory |
| Nile Tilapia (*O. niloticus*) | Grow-out | May | November | >88 | *Protection* 1. Very heavy rain (>88mm/d) may cause flooding and help fish to escape from enclosures;2. Fish producers can heighten the pond banks and use nets to protect the fish from escaping  | >44 to <88 | *Water quality*1. Heavy rain (>44 to <88 mm/d) deteriorates pond water quality (like dissolve O2 and pH level);2. Farmers can arrange artificial dissolve O2 supply;3. Farmers can apply lime after the rain;*Feeding*4. Heavy rain (>44 to <88 mm/d) also affects food intake behavior of fish;5. Fish producers can stop feeding during heavy rain; | <3 for 5 consecutive daysduring monsoon (i.e. June-September) and<1 for 5 consecutive days during pre-monsoon (March-May) and post monsoon (October-November) | *Water Quantity/Supply*1. Low or no rain can cause lack of water availability;2. Fish producers who have fishes in their ponds at grow out phase should irrigate the pond;*Harvesting*3. Low or no rain can cause disease outbreak;4. Farmers can partially harvest to reduce stocking density;*Feeding*5. Low or no rain can cause fish to less food intake;6. Farmers can reduce feeding during low/no rain; |
| Rohu *(L. Rohita)* | Grow-out | May | November |
| Black tiger shrimp/Bagda*(P. monodon)* | Grow-out | February | June |
| Fresh water prawn/Golda*(M. rosenbergii)* | Grow-out | July | November |