

Model Development Phase Template

Date	20 June 2025
Project Title	Rising water: A Machine Learning Approach to Flood Prediction
Maximum Marks	6 Marks

Model Selection Report:

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)
1. Logistic Regression	A linear classifier; effective for binary flood prediction, easy to interpret, and useful as a baseline model for detecting flood risk.	random_state=42	Accuracy score = 92.31%
2. Support Vector Classifier	A margin-based classifier; handles complex, high-dimensional flood data using kernel tricks, offering robust separation between flood and no-flood zones.	random_state=42	Accuracy score = 92.31%
3. Decision Tree Classifier	A tree-based model; captures conditional rules in flood indicators, easy to visualize, and suitable for understanding environmental triggers.	random_state=42	Accuracy score = 96.15%
4. Random Forest Classifier	An ensemble of decision trees; reduces overfitting, handles noisy environmental data well, and improves flood prediction accuracy.	random_state=42	Accuracy score = 96.15%

5. K-Nearest Neighbors	An instance-based algorithm; predicts flood events by comparing with similar historical patterns, adaptive and simple to implement.	random_state=42	Accuracy score = 96.15%
6. Naive Bayes	A probabilistic model; fast and efficient on sparse or small environmental datasets, useful when flood indicators are conditionally independent.	random_state=42	Accuracy score = 92.31%
7. XGBoost Classifier	A powerful gradient boosting model; handles large-scale environmental data, captures non-linear patterns, and offers high accuracy in flood risk prediction.	random_state=42	Accuracy score = 96.15%