

AI In Aquaculture



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Problem Statement

Aim of the project is to improve quality and quantity of aquaculture production in India.

Aquaculture production quantity and prices of aquaculture products are using time series analysis in R.

Aquaculture production quantity can be increased by encouraging more public to be take up Aquaculture. This can be done by spreading awareness about increasing trend in prices of aquaculture products, export of aquaculture products and the benefits it will bring along in the long run.

. Detecting spread of disease in Aquaculture farms at an early stage will result in improving quality and quantity of Aquaculture production in India.

Background

Increase in population has meant greater demand for seafood. 85% of marine stocks are fully exploited or overfished hence the importance of aquaculture has grown in the last 30 odd years.

Quality of aquaculture production in India has to improve in order to keep up with the rising demand. Only 16% of freshwater area and 10% of brackish water area is currently being utilized for aquaculture hence there is massive scope for improvement in this regard.

Approach/Method

Time Series Analysis for forecasting Aquaculture Production and Prices

- 10 different models are generated by performing time series analysis in R.
- Best model is selected on the basis of RMSE value as well as adjusted R-square.

Disease detection using Supervised Machine Learning Algorithms

- Dataset is divided into training and testing set using 70-30 ratio.
- K fold cross validation method is used in order to remove the bias of the dataset.
- Decision tree and random forest classifier are used as the models in order to perform the required analysis.

Observations

- Random Forest Classifier is the best model in terms of both train and test accuracy.
- K Nearest Neighbour performs worst among all the 4 models for disease prediction.
- Adding stratified K fold cross validation reduces the variance of train/test accuracies for all 4 models.
- Most of the Aquaculture production in India is carried out using freshwater.
- Contribution of Brackishwater to the overall production increased by almost 4 times from year 2010 to 2018.
- Marine water Aquaculture production in India decreased from year 2010 to 2018.

Conclusions/Future Work

- 1) Forecasted values of Aquaculture production and fish prices obtained after performing time series analysis indicates steep growing trend. This will encourage more people from rural areas to get into Aquaculture and reap benefits in the long run.
- 2) Supervised Machine Learning models implemented for disease detection will help fish farmers detect spread of disease at an early stage and they can take appropriate action in order to prevent further loss.
- 3) Aquaculture production in India is going to continue to increase in years to come hence the need of the hour is to make sure Aquaculture sector

Requirements



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