# **AquaHealth Analytics Dashboard**

# Developed an interactive dashboard for monitoring and analyzing aquaculture health and environmental data. Utilized advanced data processing techniques, plotly visualizations, and ARIMA modeling for predictive insights in sustainable fish farming.

# Application Flow

## Initialization and Authentication:

The application initializes with a predefined state, setting up titles, and default values for running the app for the first time and show some plots.

## Data Fetching and Preparation:

The get\_token function is called to authenticate and gain access to the required APIs. Functions like year\_data and get\_year\_data request specific aquaculture data for the year for all locatlities and then for the single locality.

The fetched data is processed and organized into Pandas DataFrames, which are efficient structures for handling and manipulating tabular data.

## Visualization Setup:

With the data processed, the application uses Plotly to create interactive visualizations. These visualizations include maps (\_update\_plotly\_localities), bar chart, and pie chart for all localities.

Similarly data for single locality is ploted using locality and weather data is plotted using update\_plotly\_weather.

## User Interaction Handling:

The application takes user inputs, such as selecting a year, choosing a locality, or changing visualization parameters.

Handlers like handle\_year, handle\_click, and others are responsible for responding to these interactions. They update the application's state and trigger data refresh or visualization updates.

## Detailed Analysis and Forecasting:

For a selected locality, the application fetches lice count data and weather data and build ARIMA model

## State Management and UI Updates:

Throughout the user interaction and data processing, the application's state is constantly updated. This state includes selected options, data loading status, and analysis results.

As the state changes, the UI reflects these changes. For example, updating a plot when new data is selected or displaying results of the ARIMA analysis.