

## AQUACULTURE PRODUCTION-AN OVERVIEW

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### Abstract

Aquaculture is the process of rearing, breeding and harvesting of aquatic species, both animals and plants, in controlled aquatic environments like the oceans, lakes, rivers, ponds and streams. Aquaculture sector can play a vital role in feeding the rising global demand for protein. India is the 2nd largest producer of fish in the world and about 68% of India's fish comes from the aquaculture sector. India contributes about 7.7% to the global fish production and country ranks 4th in global exports of fish products. In this situation this study is undertaken with the following objectives like to analyze the growth and performance of Fish production in India and an overview of Aquaculture in West Godavari District of Andhra Pradesh. In this context the relevant secondary data is collected from statistical books, magazines, journals and internet. The present paper examines the fish production in India, state wise fish production, fish seed production, and state wise fish consumption and export of fish production in India. it is concluded that the fish production increased marginally during 2015-16 to 19-20 and average annual growth marginally decreased during 2015-16 to 19-20. the paper also suggest that Government should concentrate on initiatives (regulations, standards, taxation and subsidy policies, market-based mechanisms) and Shift incentives to reward improvements in productivity and environmental performance for the development of annual growth rate.

**Keywords:** Aquaculture, Productivity

## Introduction

Aquaculture is the process of rearing, breeding and harvesting of aquatic species, both animals and plants, in controlled aquatic environments like the oceans, lakes, rivers, ponds and streams. It serves different purposes, including food production, restoration of threatened and endangered species populations, wild stock population enhancement, the building of aquariums, and fish cultures and habitat restoration.

World population is expected to reach 9.8 billion in 2050, implying a further increase in pressure on the existing food resources. Aquaculture sector can play a vital role in feeding the rising global demand for protein. India is the 2nd largest producer of fish in the world and about 68% of India's fish comes from the aquaculture sector. In terms of employment, the sector supports the livelihood of over 28 mn people in India especially the marginalized and vulnerable communities. Export earnings from the fisheries sector was \$6 bn during 2020-21. The Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying is implementing a flagship scheme "Pradhan Mantri Matsya Sampada Yojana (PMMSY) - A scheme to bring about Blue Revolution through sustainable and responsible development of fisheries sector in India" with highest ever investment of INR 20,050 crore for a period of five years with effect from the financial year 2020-21 to 2024-25 in all States/Union Territories (UTs).

India's top export destinations for fish and fish products are China, USA, Southeast Asia, European Union, and Japan. Fisheries sector has demonstrated an outstanding double-digit average annual growth of 10.87 per% since 2014-15 with record fish production of 145 lakh tons in FY 2020-21 (provisional) 74% of fish production was contributed by inland fisheries and the rest 26% was contributed by marine fisheries in FY 2020

India contributes about 7.7% to the global fish production and country ranks 4th in global exports of fish products. The sector envisioned to increase the farmers' income through enhancement of production and productivity, improving the quality and reduction of waste. 20-Nov-2020

The fish production in India has reached an all-time high of 14.16 million metric tons during 2019-20. The fisheries sector contributes 1.24 per cent to the GVA and 7.28 per cent to the agricultural GVA. The export of marine products stood at 12.9 lakh metric tons with a value of ₹46,662 crores during 2019-20. Fishing in India is a major industry employing 14.5 million people. India ranks second in aquaculture and third in fisheries production.

Andhra Pradesh is strategically located on the South -Eastern coast of India and is the natural gateway to East and South East Asia. The state has a population of around 4.95 crore. Andhra Pradesh has fertile river basins, extensive canal system and conducive agro climatic conditions for fishery promotion. The state has 974 kms of coastline and is one of the largest producers of marine products.

The state's coastline is also dotted with numerous major and minor ports and has along sea faring tradition The Government of Andhra Pradesh has identified the Fisheries sector as a Growth Engine for social economic development of the new State of Andhra Pradesh. The Vision 2029 Programme promotes the rational exploitation and utilization of the State's fishery resources in a manner consistent with the overall goal of sustainable development.

In this context a comprehensive fisheries policy is indispensable and therefore the Government of Andhra Pradesh has considered it necessary to specifically to undertake a Fisheries Policy with a view to determining the nature and scope of current priorities; the role and contribution of the Fisheries Sector to meet these priorities; the strengths; potentials and constraints of the sector and the requirements to make the sector more responsive to the current demands on it.

The Government of Andhra Pradesh accords top priority to Fisheries Development and its intervention for marine, brackish water, Inland fisheries, reservoirs development and ornamental fishery trade, with a view to enhance the fish production to 42 lakh tones in the next five years from the present level of 19.64 lakh tones and to double the exports value from the present level of about Rs.16000 Crores. Government with a view to make Andhra Pradesh a hub of Fisheries, hereby introduce the Fisheries Policy 2015-2020.

West Godavari District is well developed in Fisheries with Resources of Fishery wealth in Marine, Brackish Water, Reservoir and Inland Fisheries. It is in fact the aqua hub of Andhra Pradesh. Blue Revolution is well expressed in this district through a multi-pronged approach which includes the introduction of fast-growing, high-yielding species For the year 2017-18 this district, achieved 1051754 tons of Fish production- GVA Rs.10088 crores. For the year 2018-19, a target of 11.50 Lakh MT with GVA of 15,000 crores .So far achieved 9.89 lakh MT of fish and prawn production. Kolleru lake is one of the largest fresh water ecosystems(wetland) in India of international importance recognized under Ramsar Convention (Iran 1971) The Kolleru wildlife sanctuary spread over 9 mandals i.e. 7 mandals in West Godavari and 2 mandals in Krishna district with an extent of 30,855.20 hect or 77,138 acres upto +5 contour. There are 122 villages inside the sanctuary area (46 bed villages and 76 belt villages ) with a population of more than 3,00,000 people mostly dependent on the lake for their livelihoods like capturing fish and traditional agriculture in the past upto 1980s. In the bed and belt villages

Major Community is fishermen community (Vaddi community) and their livelihood is fishing. During 1975, Govt have allotted 2628 acres of land for fish culture to 58 FishermenCoop.

Societies and constructed fish ponds by them to eke out their livelihood. the total Inland Fish production in West Godavari marginally increased from 814550tons in 2017-18 to 1037010tons in 2018-19.it is evident that the total value of Inland fish production increased from 959725.35Rs in 2017-18 to 1295984.35Rs in 2018-19. The total Marine Fish production in West Godavari marginally increased from 1529 tons in 2017-18 to 1864 tons in 2018-19.itis evident that the total value of Marine fish production increased from 3301.6Rs in 2017-18 to 4012.6 Rs in 2018-19.

### **Need and Significance of the Study**

As the human population continues to grow, finding means to feed those people is one of the most important challenges faced around the globe. Fish and other aquatic organisms fit the model for healthy sources of protein. They also have more nutritional value like the addition of natural oils into the diet, such as omega 3 fatty acids and to reduce cholesterol levels as opposed to meat. Aquaculture increases the number of possible jobs in the market. It providesboth new products for a market and creates job opportunities as labor is required to maintain the pools and harvest the organisms grown. The increase in jobs is mostly realized in third world countries as aquaculture provides both a food source and an extra source of income to supplement those who live in these regions. Therefore, aquaculture is required to meet the human demand for food production and extra source of income.

### **Objectives of the Study**

- I. To analyze the growth and performance of Fish production in India.
- II. An overview of Aquaculture in West Godavari District of Andhra Pradesh.

### **Research Methodology**

Only secondary data is taken into consideration for the purpose of the study. The relevant secondary data is collected from books, magazines, journals and internet, etc

## Analysis

**Table 1 Fish production in India during 2015-16 to 2019-20**

| Fish Production in India for the period 2015-16 to 2019-20 |                                  |        |        |                                      |        |           |
|------------------------------------------------------------|----------------------------------|--------|--------|--------------------------------------|--------|-----------|
| Year                                                       | Fish production (In Lakh Tonnes) |        |        | Annual Average Growth Rate (Percent) |        |           |
|                                                            | Marine                           | Inland | Total  | Marine                               | Inland | All India |
| 2015-16                                                    | 36                               | 71.62  | 107.62 | 0.87                                 | 7.04   | 4.89      |
| 2016-17                                                    | 36.25                            | 78.06  | 114.31 | 1.14                                 | 8.63   | 6.12      |
| 2017-18                                                    | 37.56                            | 89.48  | 127.04 | 3.61                                 | 14.62  | 11.13     |
| 2018-19                                                    | 38.53                            | 97.2   | 135.73 | 2.58                                 | 8.62   | 6.84      |
| 2019-20                                                    | 37.27                            | 104.37 | 141.64 | -3.2                                 | 7.37   | 4.35      |

Source : Department of Fisheries, States Government/UTs Administration

It is evident from Table 1 that the total Fish production increased marginally from 107.62 lakhtons in 2015-16 to 141.64 lakh tons in 2019-20 whereas it can be witnessed that the total annual average growth rate increased from 4.89 percent in 2015-16 to 11.13 percent in 2017-18. thereafter it declined to 4.35 percent in 2019-20. thus, the annual average growth rate of Fish production ranged between 4.89 percent to 4.35 percent during the period 2015-16 and 2019-20.

**Table 2 State wise Fish Production during 2015-16 to 2019-20**

| State-wise Fish Production, India (In Lakh Tonnes) |         |        |         |        |         |        |         |        |         |        |
|----------------------------------------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| State/UT's                                         | 2015-16 |        | 2016-17 |        | 2017-18 |        | 2018-19 |        | 2019-20 |        |
|                                                    | Inland  | Marine | Inland  | Marine | Inland  | Marine | Inland  | Marine | Inland  | Marine |
| Andhra Pradesh                                     | 18.32   | 5.2    | 21.86   | 5.8    | 28.45   | 6.05   | 33.91   | 6      | 36.1    | 5.64   |
| Arunachal Pradesh                                  | 0.04    | 0      | 0.04    | 0      | 0.04    | 0      | 0.05    | 0      | 0.05    | 0      |
| Assam                                              | 2.94    | 0      | 3.07    | 0      | 3.27    | 0      | 3.31    | 0      | 3.73    | 0      |
| Bihar                                              | 5.07    | 0      | 5.09    | 0      | 5.88    | 0      | 6.02    | 0      | 6.41    | 0      |
| Chhattisgarh                                       | 3.42    | 0      | 3.77    | 0      | 4.57    | 0      | 4.89    | 0      | 5.72    | 0      |
| Goa                                                | 0.05    | 1.07   | 0.04    | 1.14   | 0.06    | 1.18   | 0.05    | 1.15   | 0.04    | 1.01   |
| Gujarat                                            | 1.12    | 6.97   | 1.17    | 6.99   | 1.38    | 7.01   | 1.42    | 6.99   | 1.58    | 7.01   |
| Haryana                                            | 1.21    | 0      | 1.44    | 0      | 1.9     | 0      | 1.8     | 0      | 1.91    | 0      |
| Himachal Pradesh                                   | 0.12    | 0      | 0.13    | 0      | 0.13    | 0      | 0.13    | 0      | 0.14    | 0      |
| Jharkhand                                          | 1.16    | 0      | 1.45    | 0      | 1.9     | 0      | 2.08    | 0      | 2.23    | 0      |
| Karnataka                                          | 1.69    | 4.12   | 1.59    | 3.99   | 1.88    | 4.14   | 1.98    | 3.9    | 2.29    | 4.03   |
| Kerala                                             | 2.11    | 5.17   | 1.61    | 4.31   | 1.89    | 4.84   | 1.92    | 6.09   | 2.05    | 4.75   |
| Madhya Pradesh                                     | 1.15    | 0      | 1.39    | 0      | 1.43    | 0      | 1.73    | 0      | 2       | 0      |
| Maharashtra                                        | 1.46    | 4.34   | 2       | 4.63   | 1.31    | 4.75   | 1       | 4.68   | 1.18    | 4.43   |
| Manipur                                            | 0.32    | 0      | 0.32    | 0      | 0.33    | 0      | 0.32    | 0      | 0.32    | 0      |
| Meghalaya                                          | 0.11    | 0      | 0.12    | 0      | 0.12    | 0      | 0.13    | 0      | 0.14    | 0      |

|                                                                       |       |      |       |       |       |       |       |       |        |       |
|-----------------------------------------------------------------------|-------|------|-------|-------|-------|-------|-------|-------|--------|-------|
| Mizoram                                                               | 0.07  | 0    | 0.08  | 0     | 0.08  | 0     | 0.07  | 0     | 0.07   | 0     |
| Nagaland                                                              | 0.08  | 0    | 0.09  | 0     | 0.09  | 0     | 0.09  | 0     | 0.09   | 0     |
| Odisha                                                                | 3.77  | 1.45 | 4.55  | 1.53  | 5.34  | 1.51  | 6     | 1.59  | 6.6    | 1.58  |
| Punjab                                                                | 1.2   | 0    | 1.33  | 0     | 1.37  | 0     | 1.35  | 0     | 1.51   | 0     |
| Rajasthan                                                             | 0.42  | 0    | 0.5   | 0     | 0.54  | 0     | 0.55  | 0     | 1.16   | 0     |
| Sikkim                                                                | 0     | 0    | 0     | 0     | 0     | 0     | 0     | 0     | 0      | 0     |
| TamilNadu                                                             | 2.43  | 4.67 | 1.97  | 4.72  | 1.85  | 4.97  | 1.7   | 5.2   | 1.74   | 5.83  |
| Telangana                                                             | 2.37  | 0    | 1.99  | 0     | 2.7   | 0     | 2.84  | 0     | 3      | 0     |
| Tripura                                                               | 0.69  | 0    | 0.72  | 0     | 0.77  | 0     | 0.7   | 0     | 0.78   | 0     |
| UttarPradesh                                                          | 5.05  | 0    | 6.18  | 0     | 6.29  | 0     | 6.62  | 0     | 6.99   | 0     |
| Uttarakhand                                                           | 0.04  | 0    | 0.04  | 0     | 0.05  | 0     | 0.05  | 0     | 0.05   | 0     |
| WestBengal                                                            | 14.93 | 1.78 | 15.25 | 1.77  | 15.57 | 1.85  | 16.19 | 1.63  | 16.19  | 1.63  |
| AandNIslands                                                          | 0     | 0.37 | 0     | 0.39  | 0     | 0.39  | 0     | 0.4   | 0      | 0.4   |
| Chandigarh                                                            | 0     | 0    | 0     | 0     | 0     | 0     | 0.01  | 0     | 0.01   | 0     |
| D & Nagar<br>HaveliandDama<br>nandDiu                                 | 0     | 0.23 | 0.01  | 0.23  | 0     | 0.24  | 0     | 0.28  | 0      | 0.32  |
| Delhi                                                                 | 0.01  | 0    | 0.01  | 0     | 0.01  | 0     | 0     | 0     | 0.01   | 0     |
| Jammu&Kashm<br>i r                                                    | 0.2   | 0    | 0.2   | 0     | 0.21  | 0     | 0.21  | 0     | 0.21   | 0     |
| Ladakh                                                                | -     | -    | -     | -     | -     | -     | -     | -     | 0      | 0     |
| Lakshadweep                                                           | 0     | 0.16 | 0     | 0.3   | 0     | 0.21  | 0     | 0.22  | 0      | 0.2   |
| Puducherry                                                            | 0.07  | 0.47 | 0.04  | 0.46  | 0.07  | 0.42  | 0.07  | 0.4   | 0.07   | 0.44  |
| India                                                                 | 71.62 | 36   | 78.06 | 36.25 | 89.48 | 37.56 | 97.2  | 38.53 | 104.37 | 37.27 |
| Source: Department of Fisheries, States Government/UTs Administration |       |      |       |       |       |       |       |       |        |       |

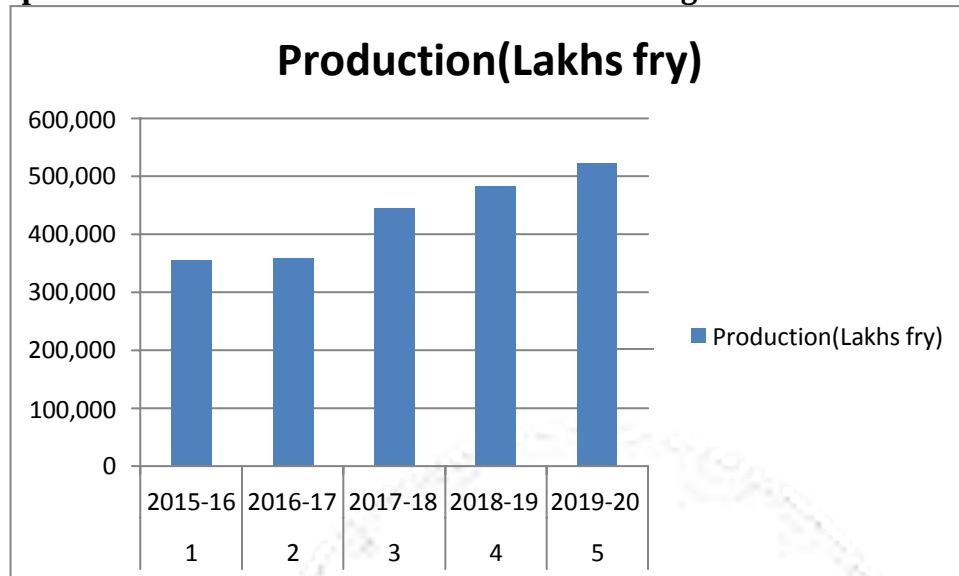
It is clear from Table 2 that the total fish production of India in inland increased marginally from 71.62 lakh tons in 2015-16 to 104.37 lakh tons in 2019-20 and it can be witnessed that the total fish production of india in Marine marginally increased from 36 lakh tons in 2015-16 to 38.53 lakh tons in 2018-19.therefore it declined to 37.27 lakh tons in 2019-20.it is evident that the Andhra Pradesh has recorded the highest production of inland fish (36.1 lakh tones) where as Gujarat is the leading state in Marine fish (7.01 Lakh tonnes) in the country.

**Table 3 Fish Seed Production in India during 2015-16 to 2019-20**

| Year    | Production(Lakhs fry) |
|---------|-----------------------|
| 2015-16 | 3,54,350              |
| 2016-17 | 3,57,439              |
| 2017-18 | 4,44,207              |
| 2018-19 | 4,81,974              |
| 2019-20 | 5,21,706              |

**Source:** Director of Fisheries, State Govt./UT's Administration

**Graph 1 Total Fish Seed Production in India during 2015-16 to 2019-20(Lakhs Fry)**



It is evident from Table 3 and Graph 1 that the total fish seed production marginally increased from 3,54,350 Lakhs fry in 2015-16 to 5,21,706 in 2019-20. It can be witnessed that there is a significant growth in seed production during 2015 to 2020 in India.

**Table 4 State wise Fish consumption Data during 2019 to 2020**

| States/UT's       | Yearly Fish Consumption (Per Capita/Kg.)2019-20 |
|-------------------|-------------------------------------------------|
| Andhra Pradesh    | 8.07                                            |
| Arunachal Pradesh | 3.52                                            |
| Assam             | 11.72                                           |
| Bihar             | 8.82                                            |
| Chhattisgarh      | 4.66                                            |
| Goa               | NA                                              |
| Gujarat           | 9.55                                            |
| Haryana*          | NA                                              |
| Himachal Pradesh  | 2.16                                            |
| Jharkhand         | 10.32                                           |
| Karnataka         | 7.56                                            |
| Kerala            | 19.41                                           |
| Madhya Pradesh    | 2.76                                            |
| Maharashtra       | 3.02                                            |

|                           |       |
|---------------------------|-------|
| Manipur                   | 14.1  |
| Meghalaya                 | 10.98 |
| Mizoram                   | 5.54  |
| Nagaland                  | 6.68  |
| Odisha                    | 13.79 |
| Punjab                    | 0.4   |
| Rajasthan                 | 0.01  |
| Sikkim                    | 1.16  |
| TamilNadu                 | 9.6   |
| Telangana                 | 8.87  |
| Tripura                   | 29.29 |
| Uttarakhand               | 0.49  |
| UttarPradesh              | 10.89 |
| WestBengal                | NA    |
| AandNIslands              | 59.47 |
| Chandigarh                | NA    |
| DamanandDiu,D&NagarHaveli | NA    |
| Delhi                     | NA    |
| Jammu&Kashmir             | 3     |
| Ladakh                    | NA    |
| Lakshadweep               | NA    |
| Puducherry                | 30    |

As per estimates, Andhra Pradesh produces over 42 lakh tonnes of fish per year and exports it to various parts in the country and abroad. It is evident from Table 4 that People from Andaman and Nicobar Islands consume more fish, 59.47 kg per person, followed Tripura which has an annual per capita fish consumption of 29.29 kg in 2019-20.

**Table 5 Trend of Export of Fish and Fish Products during 2015-16 to 2019-20**

| Trend of Export of Fish and Fish Products:2019-20           |                  |               |                       |                        |                  |                       |       |
|-------------------------------------------------------------|------------------|---------------|-----------------------|------------------------|------------------|-----------------------|-------|
| Year                                                        | Quantity(Tonnes) | Value(1Crore) | US Dollar(\$:Million) | Unit value(Rs./Tonnes) | Unit value Index | Annual growth rate(%) |       |
|                                                             |                  |               |                       |                        |                  | Quantity              | Value |
| 2015-16                                                     | 9,45,891.90      | 30,420.83     | 4,687.94              | 3,21,609.99            | 12,907.06        | -10.02                | -9.03 |
| 2016-17                                                     | 11,34,948.09     | 37,870.90     | 5,777.61              | 3,33,679.62            | 13,391.45        | 19.99                 | 24.49 |
| 2017-18                                                     | 13,77,243.70     | 45,106.89     | 7,081.55              | 3,27,515.69            | 13,144.07        | 21.35                 | 19.11 |
| 2018-19                                                     | 13,92,558.89     | 46,589.37     | 6,728.50              | 3,34,559.46            | 13,426.76        | 1.11                  | 3.29  |
| 2019-20                                                     | 12,89,650.90     | 46,662.85     | 6,678.69              | 3,61,825.42            | 14,521.01        | -7.39                 | 0.16  |
| Source: Marine Products Export Development Authority, Kochi |                  |               |                       |                        |                  |                       |       |

It is evident from Table 5 that the quantity marginally increased from 9,45,891.90 tonnes in 2015-16 to 13,92,558.89 tonnes in 2018-19. thereafter it declined to 12,89,650.90 tonnes in 2019-20. it can be witnessed that the total value of Fish products marginally increased from 30,420.83 Rs in 2015-16 to 46,662.85 Rs in 2019-20. it is clear from that the US Dollar value of Fish products marginally increased from 4,687.94 Millions in 2015-16 to 7,081.55 Millions in 2017-18. thereafter it declined to 6,678.69 Millions in 2019-20. It is noted that the total Unit value Index of Fish products marginally increased from 12,907.06 Rs in 2015-16 to 14,521.01 Rs in 2019-20. it can be witnessed that the total value of Fish products annual growth rate started with Negative(-9.03) percent in 2015-16 then marginally increased to 24.49 percent in 2016-17. thereafter total annual growth declined to 0.16 percent in 2019-20. Thus, the annual growth rate of Fish production ranged between -9.03 percent to 0.16 percent during the period 2015-16 and 2019-20.

**Table 6 Fish and Prawn Production (in Metric tonnes) Andhra Pradesh Vs WestGodavari**

| Fish and Prawn Production (in Metric tonnes)<br>Andhra Pradesh Vs West Godavari |                |                       |                                |
|---------------------------------------------------------------------------------|----------------|-----------------------|--------------------------------|
| Year                                                                            | Andhra Pradesh | West GodavariDistrict | West Godavari percent in AP(%) |
| 2014 – 15                                                                       | 1978578        | 612616                | 30.96                          |
| 2015 – 16                                                                       | 2352263        | 731803                | 31.11                          |
| 2016 – 17                                                                       | 2766193        | 827226                | 29.90                          |
| 2017 – 18                                                                       | 3449558        | 1051754               | 30.48                          |
| 2018-19                                                                         | 4485200        | 11,52,201             | 25.68                          |

**Source:** West Godavari.ap.gov.in

It can be noted from Table 6 the total Fish and Prawn production marginally increased from 1978578 Metric tons in 2014-15 to 4485200 Metric tons in 2018-19.it is evident that the totalFish and Prawn production marginally increased from 612616 Metric tons in 2014-15 to11,52,201 Metric tons in 2018-19.it is evident that the Fish and Prawn production position of West Godavari in Andhra Pradesh marginally increased from 30.96 percent in 2014-15 to 31.11 percent in2015-16 .thereafter it slight declined to 29.90 percent in 206-17.Later it increased to 30.48 percent in 2017-19.thereafter it declined to 25.68 percent in 2018-19. thus, the percentage of Fish and Prawn production in West Godavari District in AP ranged between30.96 percent to 25.68 percent during the period 2014-15 and 2018-19.

**Table 7 Aquacultures areas in West Godavari District**

| Name of the Mandal | Total Culture area(in Hectares) |
|--------------------|---------------------------------|
| Ganapavaram        | 2686.72                         |
| Attili             | 1049.69                         |
| Penumantra         | 1179.12                         |
| Akiveedu           | 4595.49                         |
| Undi               | 5174.343                        |
| Kalla              | 6755.27                         |
| Bhimavaram         | 9009.31                         |
| Palakoderu         | 994.32                          |
| Veeravasaram       | 1138.7                          |
| Palakollu          | 1137.934                        |
| Poduru             | 775.43                          |
| Achanta            | 305.06                          |
| Elamanchili        | 928.02                          |
| Narsapuram         | 2839.38                         |
| Mogalthuru         | 3749.08                         |
| Eluru              | 5337.51                         |
| Pedapadu           | 4108.72                         |
| Bhimadole          | 4657.21                         |
| Iragavaram         | 158.156                         |
| Tanuku             | 9.32                            |
| Peravali           | 131.466                         |
| Chagallu           | 59.36                           |
| Penugonda          | 45.176                          |
| Nidadavolu         | 285.97                          |
| Nidamaru           | 5635.55                         |
| Undrajavaram       | 88.23                           |
| Unguturu           | 2186.97                         |
| Pentapadu          | 314.12                          |
| Denduluru          | 3056.54                         |
| TOTAL              | 67,518.30hect                   |

**Source:** Handbook of Statistics 2019 West Godavari District

It is clear from Table 7 that the total Aqual culture areas in West Godavari District is 67,518.30hectares it can be witnessed that Bhimavaram is leading area of 9009.31hectares followed by Kalla area of 6755.27 hectares in West Godavari District.

### **Suggestions for Aquaculture Improvement**

- The producer should concentrate on quality aqua product to improve marketing facilities.
- The producer should increase investment in technological innovation and transfer for Aquaculture Development
- Government should concentrate on initiatives (regulations, standards, taxation and subsidy policies, market-based mechanisms) and Shift incentives to reward improvements in productivity and environmental performance
- The producer leverage the latest information technology to drive gains in productivity and environmental performance

### **Conclusion**

Aquaculture sector can play a vital role in feeding the rising global demand for protein. India is the 2nd largest producer of fish in the world and about 68% of India's fish comes from the aquaculture sector. India contributes about 7.7% to the global fish production and country ranks 4th in global exports of fish products. India's top export destinations for fish and fish products are China, USA, Southeast Asia, European Union, and Japan. Fisheries sector has demonstrated an outstanding double-digit average annual growth of 10.87 per% since 2014-15 with record fish production of 145 lakh tons in FY 2020-21 (provisional) 74% of fish production was contributed by inland fisheries and the rest 26% was contributed by marine fisheries in FY2020. finally it is concluded that the producer and government should concentrate on quality aqua product to improve marketing facilities and increase investment in technological innovation and transfer for Aquaculture Development.

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