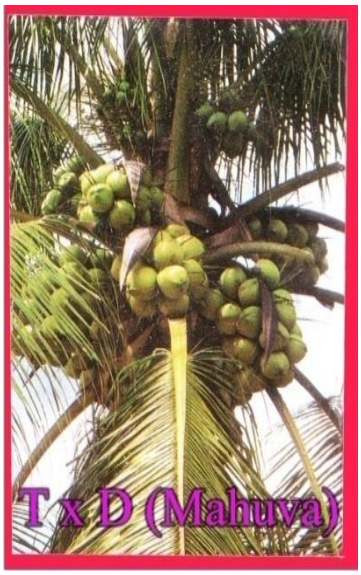

STATUS REPORT

2019-2020

: OFFICE :

RESEARCH SCIENTIST (HORT.)

AGRICULTURAL RESEARCH STATION (FRUIT CROPS)

JUNAGADH AGRICULTURAL UNIVERSITY

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Agricultural Research Station (Fruit Crops)
Junagadh Agricultural University
Mahuva, Dist. Bhavnagar
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Coconut at a Glance:

Botany:

1)	**Botanical Name**	**:**	*Cocos nucifera* L.
2)	**English Name**	**:**	Coconut
3)	**2n**	=	32
4)	**Family**	**:**	Arecaceae
5)	**Plant Type**	**:**	Monocot, Monoecious

World's Largest Coconut Germplasm at Andaman (India):

Exogining	:-	Tall-70	Medium Tall-2	Dwarf-14	=86
Endogining	:-	Tall-29	Medium Tall-0	Dwarf-11	=40
				Total	=126

Climate Requirement:

1)	**Tropical Plantation crop**			
2)	**Temperature**	**Max**	**:-**	35^0C
3)		**Min**	**:-**	15^0C
4)		**Optimum**	**:-**	25-27^0C
5)	**Rainfall**		**:-**	1000-2500mm
6)	**Humidity**		**:-**	>50-60%

Quality of Irrigation Water:

1) Tolerance up to 11EC
2) Optimum <1EC

Area, Production and Productivity:

	World (2018) (93 countries)	**India (2018)** (15 States)	**Gujarat (2016)** (5 Dist.)
1) Area('000 ha.)	12381.05	2098.95	24.44
2) Production (million nut)	68450.87	24171.46	336.65
3) Productivity (nut/ha)	5577	11516	13775
4) Farmer family (million)	64	12	-

Gujarat	**District**	**Area (ha)**	**Production** (million nut)	**Productivity** (nut/ha)
	Gir Somnath	8500 (First)	84.58	9950
	Junagadh	5230 (Second)	52.04	9950
	Bhavnagar	3600 (Third)	35.64	9900

Cost of Cultivation:

Sr.No.	Type of Orchard	Cost Rs/ha.	Income
1)	Rainfed	69182	85750
2)	Irrigation	77322	110260

Role of Coconut Development Board:

1) Training organizer on coconut
2) Supply of true to type seedlings
3) Helpful to establish coconut co-operative society
4) Provide 50 % insurance

The coconut palm (*Cocos nucifera*L.) is the most useful palm in the world. Every part of the tree is useful to human life for some purpose or the other. Hence, the coconut palm is endearingly called '**Kalpavriksha**' meaning the tree of heaven. The copra obtained by drying the kernel of coconut is the richest source of vegetable oil containing 65 to 70 per cent oil.

The Coconut tree is a member of the family Arecaceae (palm family). It is the only accepted species in the genus Cocos. The term Coconut can refer to the entire coconut palm, the seed, or the fruit, which, botanically, is a drupe, not a nut. The spelling cocoanut is an archaic form of the word. The term is derived from 16th-century Portuguese and Spanish coco, meaning "head" or "skull", from the three indentations on the coconut shell that resemble facial features.

The coconut is known for its great versatility as seen in the many uses of its different parts and found throughout the tropics and subtropics. Coconuts are part of the daily diets of many people. Coconuts are different from any other fruits because they contain a large quantity of "water" and when immature they are known as tender-nuts or jelly-nuts and may be harvested for drinking. When mature, they still contain some water and can be used as seed nuts or processed to give oil from the kernel, charcoal from the hard shell and coir from the fibrous husk. The endosperm is initially in its nuclear phase suspended within the coconut water. As development continues, cellular layers of endosperm deposit along the walls of the coconut, becoming the edible coconut "flesh". When dried, the coconut flesh is called copra. The oil and milk derived from it are commonly used in cooking and frying; coconut oil is also widely used in soaps and cosmetics. The clear liquid coconut water within is potable. The husks and leaves can be used as material to make a variety of products for furnishing and decorating. It also has cultural and religious significance in many societies that use it.

Monthly Average Weather data of last 10- year:

Month	Temperature (^{0}C)		Relative Humidity (%) at 8.00 a.m.	Rainfall (mm)	Evaporation (mm)
	Maximum	Minimum			
January	32.3	10.0	53.2	0	4.60
February	35.2	12.2	48.1	0	5.60
March	39.5	16.4	50.4	0	6.38
April	39.7	19.8	57.0	0	8.20
May	38.2	22.3	60.5	0	7.59
June	37.2	23.1	73.7	119.2	5.37
July	33.5	22.8	78.4	146.2	3.42
August	33.5	23.0	78.4	164.2	3.68
September	35.8	22.1	78.6	185.0	3.82
October	36.1	16.8	70.3	43.2	4.78
November	35.3	15.5	56.9	0	4.87
December	34.1	11.6	53.0	0	4.66
Total				**657.7**	

This farm was started in 1852 by His Highness Late Shree Bhavsinhji of Bhavnagar State having area of 1529 acre. Thus, this farm may be one of the biggest and the oldest farm of our state. In 1947 this farm was handed over to Agriculture Department, Government of Gujarat for extension and nursery activities to bring more and more coastal area under coconut plantation through supplying the best selected coconut seedlings to the growers. In 1972, this farm was transferred to Gujarat Agricultural University to conduct the research activities on coconut and other fruit crop. From 2004 and onwards, this farm belongs to Junagadh Agricultural University.

***Mandate:**

- To evolve high yielding variety of coconut.
- To find out suitable plant protection measure against coconut pest and disease.
- To determine most suitable and effective, eco-friendly and low cost agronomical practices for the production of coconut and fruit crop.
- To introduce new fruit and plantation crops for the region.
- To supply the true to type planting materials of coconut and fruit crops to the farmers.

- To produce maximum skilled aqua farmers.
- To developed standard culture technique for shrimp farmers in and around.
- To boost aqua production of this district.

***Objectives:**

- Collection evaluation and maintenance of indigenous and exotic germplasm of coconut and fruit crops.
- To generate germplasm for developing biotic and abiotic stress resistant high yielding varieties of plantation and fruit crops.
- To test and develop new production technology for plantation and fruit crop.
- To produce and distribute seedling of coconut of varieties D x T (Mahuva) among the farmers.
- To develop farming facilities for freshwater and brackish water finfish and shell fish cultivation in saline ground water.
- To develop suitable technology for enhancement of fish and shell fish production in salt affected soil.
- To conduct short term training -cum demonstration on fresh and brackish water Fish/Prawn/shrimp cultivation techniques for fish farmers.

***INFRASTRUCTURE:**

Total area of farm	**:**	581 ha
Farm area shaded under Malan reservoir water	**:**	127 ha
Farm area shaded under Nicol reservoir water	**:**	89 ha
Farm area under Horticultural crops	**:**	130 ha
Area under Agricultural Crops	**:**	15 ha
Area under Problematic soil	**:**	129 ha
Area under fisheries research	**:**	75 ha
Area under structure/buildings/pond	**:**	16 ha
Irrigation Sources**:** Tube well – 18, Nicol & Malan bandhara Channels		

*** COMPARATIVE EVALUATION OF FARM CONDITIONS:**

Sr. No.	Components	Farm Condition	
		Up to 1975	**At Present (2019-20)**
1	Name of the Agro-climatic Zone	South Saurashtra Agro-climatic zone – VII	South Saurashtra Agro-climatic zone – VII
2	Rainfall	The annual rainfall of this region for the last five years with an average precipitation of 1000-1200 mm.	The annual rainfall of this region for the last five years from with an average precipitation of 800-1100 mm.
3	Soil	The soil of the farm is Medium black to sandy loam in texture, poor in organic carbon, medium in available potash. Most of the micro-nutrients are up to sufficient level in the soil and soil is highly fertile and productive.	The soil of the farm is Medium black to sandy loam in texture, poor in organic carbon, medium in available potash. Most of the micro-nutrients are not up to sufficient level in the soil and soil became saline with poor drainage, less fertile and low productive.
4	Water	Water table was very high and irrigation facility of good quality water was available throughout the year as Malan river was running through the year and well water was also of good quality.	Irrigation facility of good quality water is dependent on rain fall but not available throughout the year as the flow of Malan river is restricted and well water became salty because of ingress of sea water.
5	Well depth	Water level at 12 ft.	Water level at 50 ft.
6	Temperature	Sub-tropical with humid climate, mean monthly minimum temperature varying from 15 ^{0}C to 22 ^{0}C and maximum temperature varies from 23 ^{0}C to 32 ^{0}C.	Sub-tropical with humid climate, mean monthly minimum temperature varying from 22 ^{0}C to 26 ^{0}C and maximum temperature varies from 32 ^{0}C to 37 ^{0}C.
7	Geographical details		
	Climate	Subtropical,	Subtropical,
	Latitude	21.5' N	21.5' N

	Longitude	71.5' E	71.5' E
	Altitude	24 mt.MSL	24 mt.MSL
8	Soil properties	Medium black to sandy loam, highly fertile & productive, responsive to fertilizers and not completely saline.	Medium black to sandy loam, poor in fertility & productivity, low responsive to fertilizers and most of the land under cultivation became saline.
9	Fruit crops	Horticultural crops like Mango, Coconut, Areca nut, Banana and sapota were cultivated.	Horticultural crops like Coconut, Mango, Sapota, Areca nut, Pomegranate, Guava and Lime were cultivated.

*** REASONS FOR DEGRADATION OF SOIL:**

The object to establish this farm was to bring fellow land of coastal area under horticulture crops like mango, coconut, arecanut, chiku, banana, etc. This farm also situated on bank of Malan River, and there was ample source of sweet irrigation water at that time and because of that large area of farm, it was covered under coconut, mango, chiku, areca nut etc. crops. Equable humid climate of coastal area and evergreen with many horticultural orchards in the city and surrounding area this Mahuva city was well known as a Kashmir of Saurashtra. This status was maintained till 1975 and during this time, two dames were constructed on Malan River. But insufficient and uneven rainfall stopped the flow of Malan River which was running throughout the year. This has resulted in acute shortage of irrigation water. As farmers lifted more ground water for irrigation, ultimately resulted in brackish water and now it has became totally saline.

Thus, irrigation water of this area is totally saline (5-12 EC) which resulted great setback on development and yield potentiality of orchard. Crops like mango and arecanut are totally destroyed; only coconut and sapota which are moderately tolerant against salinity are exists with poor bearing and inferior fruit quality. The nearest city and railway station is Mahuva 3 km away and nearest district place and aerodrome is Bhavnagar, 100km away from Mahuva.

*** IMPACT OF NICOL and MALAN BANDHARA/RESERVOIR ON FARM:**

Government of Gujarat, Salinity Control Board, Gandhinagar in the year 2001-2002 constructed Nicol Bandhara (Reservoir constructed by restricting water flow of river to sea) and the reservoir water made available to the farm for irrigation purpose by means of

underground R.C.C. pipe lines of 700 meter length. In the same way in year 2009-10, Government of Gujarat, Salinity Control Board, Gandhinagar constructed Malan Bandhara (Reservoir constructed by restricting water flow of river to sea). This led to increase the irrigation water availability/sources for farm and efforts are under progress to utilize this water for irrigation purpose whenever it is available. Because of this, the water availability is up to February to March, when these reservoir are over flowed (sufficient rain fall). But in case of insufficient rainfall, the water availability is up to December. This led to reduction in mortality of existing palm up to ten per cent and increased the production and improved nut quality; ultimately resulted in annual farm income which is generated through auction of coconut palms of our station. Irrigation facility also increased the nursery production of quality seedlings of coconut. This has also benefited the ongoing research work at this station as planting of different fruit crops could be possible by utilizing the bandhara water in proper way.

* **Research Recommendations for the Farmers:**

AGRONOMY:

- To get vigorous coconut seedling growth, the farmers of South Saurashtra regions are advised to apply 90 kg Nitrogen per hectare in form of urea and 90 kg nitrogen per hectare in form of castor cake in coconut nursery during fifth month after nut sowing (1993).
- After 1 month opening of the inflorescence in cultivar West coast Tall four sprays of 20 ppm 2 – 4 D at weekly interval are recommended to minimized the nut shedding (1995).
- Coconut growers of South Saurashtra are advised to apply 47 liters Water / palm / day in summer (March to June) and 30 liters water / palm / day during winter (October to February) in adult plantation (40 to 50 Years Old) of West coast Tall variety through four droppers / palm at one meter distance from trunk, saves 47 % of water (1996).
- Coconut growers of Saurashtra region are advised to apply irrigation 22 days interval during winter and summer 15 days interval to the 40-50 years old coconut orchard of virility W.C.T. having basin size 4x4 sq. meter or in 2.50 meter radius circumferences. The mulching was not found beneficial in this type of old plantation (1997).
- Sapota growers of South Saurashtra regions are advised to apply 72 liter water / tree / day in summer (March to June) and 52 liter water / tree / day in winter (October to February) in adult sapota tree (15 to 20 years old) through keeping four drippers / tree as it is saving 32.6 % of water without any statistically reduction in yield (2007).

- The coconut growing farmers of South Saurashtra Agro-climatic region are advised to apply half dose of recommended chemical fertilizers i.e. N.P.K. 200-160-750 g per palm per year along with 5 kg castor cake in two equal splits (June & October) to coconut cultivar West Coast Tall to increase the nut yield with improvement in nut quality and soil fertility (2009).
- The nursery growers of south Saurashtra agro climatic zone producing coconut seedlings are advised to grow coconut seed nut in month of June under low cost net house (50 % shed net) to get higher quality seedling and net return as compared to open field (2010).
- Onion growers of South Saurashtra Agro climatic zone having sodic soil and brackish irrigation water condition are advised to apply Gypsum 5t / ha with 50 % recommended dose of chemical fertilizer (N-P-K 37.5-30-25 kg/ha) and Neem Cake 900 kg /ha to get maximum yield and net return of onion cv. Talaja Red (2010).
- Vegetable growers of south Saurashtra Agro Climatic Zone growing Bottle gourd cv. Pusa Naveen under sodic soil and brackish irrigation water condition are advised to apply FYM 5 t/ha along with half recommended dose of chemical fertilizer i.e. 50:25:25, N:P:K kg/ha and Poultry Manure 3.3 t/ha to get maximum yield and net return. (2011).
- Farmers of south Saurashtra region growing Sapota cv. Kalipati are advised to apply full recommended dose of phosphorus and potash (450 g/plant P & K each) along with half dose of nitrogen (11.25 kg castor cake) and 100 g *Azatobacter* per plant during onset of monsoon and half recommended dose of nitrogen i.e. 450 g/plant during October to get higher fruit yield and net return. (2011).
- The coconut growers of South Saurashtra Agro-climatic region are advised to apply full recommended dose of chemical fertilizer (1500, 750, 1500 NPK g/palm) and two dose each of 400 ml of nutrient solution in June and October [10 g urea and muriate of potash each, 5 g zinc sulphate, 2 g Ferrous sulphate, magnesium sulphate, Manganese sulphate and Borexeach,1 g Copper sulphate, 10 g Sodium molybdate and Citric acid each and 460 mg NAA (10 ml Planofix) dissolved in one liter of water] through root feeding to get higher nut yield and net return in coconut cv. D x T (Mahuva) (2011).
- Coconut growers of South Saurashtra Agro-climatic Zone are advised to grow sorghum cv. Gundari for green and dry fodder or maize cv. African Tall for dry fodder purpose as an intercrop in adult plantation of coconut hybrid T x D to get additional net return without decreasing coconut yield (2012-13).
- Coconut growers of South Saurashtra Agro-climatic Zone are advised to grow either multi cut sorghum cv. SSG-59-3 or multi cut Napier grass cv. APBN-1 (hybrid Napier)

for green fodder purpose as an intercrop in adult plantation of coconut hybrid T x D to get additional net return without decreasing coconut yield (2012-13).

- Coconut growers of South Saurashtra Agro-climatic Zone are advised to grow sunhemp or dhaincha as green manuring crop in adult coconut plantation (TxD hybrid) for improving soil fertility and to get more yield and net return (2013-14)
- The farmers of South Saurashtra Agro-climatic Zone growing Rabi tomato under sodic soil (pH 7.81, ESP 21.84) and brackish water (EC 4.34- 4.88) condition are advised to apply F.Y.M. (5 t/ha) + ½ R.D.F. (N-P-K, 37.5 + 18.75 + 18.75) + Poultry Manure (3700 kg/ha) for securing higher yield and net return (2014-15)
- The farmers of South Saurashtra agro climatic zone growing Green purpose Coriander in summer season are advised to use 75% White Shed net in low cost shed net house for securing higher yield and net return (2016-17)
- The farmers of South Saurashtra agro climatic zone growing Green purpose Fenugreek in summer season are advised to use 75% White Shed net in low cost shed net house for securing higher yield and net return (2016-17)
- The farmers of South Saurashtra agro climatic zone growing Mango cv. Jamadar are advised to apply chemical fertilizers and Poultry Manure as per following schedule for securing higher yield and net return (2016-17)

Age of tree (Year)	Poultry Manure (kg/plant)	N (g/plant)	P (g/plant)	K (g/plant)
4th year	20	160	64	232
5th year	25	200	80	290
6th year	30	240	96	348
7th year	35	280	112	406

***PLANT BREEDING:**

- Farmers of South Saurashtra region are advised to grow Gudajali (Dwarf green) variety of coconut for drinking water purpose (1982).
- Hybrid variety (D x T Mahuva) of coconut is released for coconut growers of Gujarat State (1995).
- Hybrid variety (T x D Mahuva) of coconut is released for coconut growers of Gujarat State (2006).

***PLANT PROTECTION:**

- For effective control of bud rot of coconut, spray Bordeaux mixture 4:4:50 or mancozeb 0.2% in 5 liters of water / palm, first spray is to be carried out before onset of monsoon

and 2nd and 3rd spray at the in furred of two months to be applied at one month's interval after 1st spray and remaining 3 sprays month interval (1984).

- For effective mechanical control of rat in coconut orchard use galvanized or aluminum sheet of 30 cm width (20 gauge) belt / bell shape to fix on coconut trunk at 2.5 meter height (1985).
- For effective chemical control or rat in coconut orchard apply bromodeolone 0.005% candy (50 gm/tree) or 2% zinc phosphide (1985).
- For effective control of black headed caterpillar in coconut palm of below and above 15 years age apply, monocrotophose 40% @ 5ml /palm and 10 ml /palm with equal quantity of water, respectively by root absorption method (1986).
- For the control of black headed caterpillar in coconut, spray 0.7% endosulphan or 0.07% phosalone of 0.05% monocroptophose (1986).
- For effective control of scale insect to apply phosphamidon 0.03% or monocrotophose 0.05% by foliar spray or monocrotophose10ml/palm with equal quantity of water through root absorption (1996).
- For effective and economical management of eriophyid mite in coconut, root feeding application of azadiractin 2.5 % @ 15 ml with equal water quantity per palm at two months interval throughout the year is recommended under south saurashtra agro climatic zone (2010).
- For the effective and economical management of Eriophyid mite in hybrid coconut (DxTMahuva), application of half recommended dose of chemical fertilizer (NPK-0.750, 0.375, 0.750 kg/palm/year) with 50 kg FYM, 1.5 kg gypsum and 0.075 kg borax per palm per year in June and remaining half dose of recommended chemical fertilizer (NPK-0.750, 0.375, 0.750 kg/palm/year) in October, is recommended under south Saurashtra agro climatic zone (2011).
- It inform to farmers and Scientific community that coconut eriophidmite damage was higher in summer and lower in winter**,** higher damage covered in dwarf green variety and less damage covered in west coast tall (WCT), In hybrid variety higher damage found in D x T as compared to T x D.

***FISHERIES:**

- Fish Farmers are recommended to incorporate three Probiotics *Lactobacillus subtilis* (15x107cfu/g) +*Bacillus subtilis* (10x107cfu/g) +*Sacromycescerevisiae* (10x107cfu/g) in

the ratio of 4:3:4@ 3% in fish feed to obtain higher growth, nutritive value and survival rate of *Labeorohita* in rearing pond.

- Shrimp farmers who is willing to culture *Fenneropenaeusmerguiensis*)Banana shrimp) shrimp in their pond are recommended to adopt pond bottom, having combination of sea sand + mud (50:50) with approx. 6 inch sediment thickness, to obtain better growth and survival rate.
- The brackish water shrimp growing farmers are recommended to stock *Littopenaeus vannamei* shrimp seeds @ 25 pc/m^2 to obtain better survival, growth and economical return.
- Shrimp farmers are recommended to stock *Litopenaeus vannamei* shrimp seeds @25 pc/m^2 to obtain better count, good individual shrimp weight, higher survival rate and higher harvesting biomass with low FCR and more profitability.
- Fish farmers culturing Tilapia (*Oreochromis mosambicus*) are recommended **to** utilize dried shrimp sludge as feed @10% of fish body weight along with 5% self-formulated shrimp feed (SFSF) of 30% protein content to obtain better growth, survival rate with low production cost.

***AWARD RECEIVED:**

- This station won the Sardar Patel Research Award for the development and release of Coconut Hybrid D x T (Mahuva) variety in 1997.

* **CERTIFICATE:**

- Fisheries Research and Training centre has being certified & registered vide no. GJ-II-2016 (761) by Coastal Aquaculture Authority of India, Chennai for SPF *Litopenaeus vannamei* / *P. monodon* commercial/ research aqua farming.

* **Research Recommendations for Scientific Community:**

- From the survey of five districts of South Saurashtra and South Gujarat region, it was observed that only 14.29 % farmers are growing hybrid coconut varieties (D x T and T x D) and 63.81 % farmers preferred seedlings from nursery of university as well as horticulture departments of state Government. While, 38.10 % farmers are growing coconut as per recommended spacing and 50 % farmers follow recommended dose of fertilizers. It was also observed that only 10 % farmers adopt the recommended irrigation practices and none of the farmers is using drip irrigation and plant protection measures in

their orchards. Therefore, it is suggested that the extension functionaries are required to motivate the farmers to adopt recommended cultivation practices for coconut (2011).

❖ **Transfer of Technologies**:

The technologies developed at this research station is being disseminated to the various extension agencies, N.G.O's, farmers and students by Organizing trainings, farmers day / agri. fair at the station, by participating in the ' Krushi Mela ', farmers days, world soil health day and Agri. Exhibition organized by University or other agencies and to farmers during visit of this station. Through TV, Radio broadcasting, literature, press note, personnel / spot field diagnosis and letter etc the extension activities is carried out.

❖ **Shrimp species availability:**

The Fisheries scientists are suggested that at Mahuva area cultivable shrimp seeds are available in scanty catch composition of *Metapenaeus kutchensis* followed by *Fenneropenaeus merguiensis*, *F. indicus* and *P. monodon* with peak during month of Sept. to January whereas at Jafrabad scanty catch composition of *F. merguiensis* followed by *Metapenaeus kutchensis*, *F. indicus* & *P. monodon* during April to May are available.

***ON GOING EXPERIMENTS (2019-20):**

1) Research in fruit crops – (B.H.-5014):

Horticulture:

i: Performance of different varieties of pomegranate (*Punicagranatum*L.) in coastal region.

ii. Effect of Nitrogen levels on growth, yield and quality of different Pineapple varieties.

iii. Efficacy of different insecticides against Eriophyid mites (*Aceria guerrenonis* Keifer) infesting Coconut Cv. D x T

iv. Varietal screening of pomegranate (*Punica granatum* L.) against anar butterfly (*Virachola isocrates* Fab.) in coastal region

Bio-control:

i. Studies on seasonal activity *Opisina arenosella* W. and its parasitism.

2) Scheme Center of Excellence for Soil & Water Management Technology (B.H. 12101/04):

i: High Density Planting of Sapota under saline soil

ii. Feasibility of organic farming in pomegranate (*Punica granatum* L.) under saline water irrigation condition

3) Scheme Establishment of New Research Center on Onion Crops Sub-Center-Mahuva (B.H. 12931):

i. Large Scale Varietal Trial on Red and Red Dark Onion
ii. Evaluation of Biocontrol agent and its combination against disease complex of onion.

4) Scheme strengthening of research in plantation and fruit crops (B.H.12586)

i) Effect of chemical fertilizer application in split on coconut cv. TxD Mahuva
ii) High density planting in Mango cv. Kesar
iii) Evaluation of coconut (*Cocos nucifera* L.) genotype
iv) Effect of Biofertilizers on Seedling Growth and Biochemical Changes of Coconut (*Cocos nucifera* L.)
v) Management of bud rot disease in coconut nursery.

5) Establishment of Aqua Based Research and Training Centre in Coastal Saurashtra at Mahuva (B. H. 12016):

i. Replacing fish meal by shrimp protein hydrolysate in Littopenaeusvannamei (Boone, 1931) feeds formulation.
ii. Effect of different level of protein on the growth and survival of Teraponjarbua (Forsskal, 1775) fry.

Future Thrust:

1) Develop biotic and abiotic resistant variety
2) Develop dwarf and early variety
3) Value addition
4) Replanting & rejuvenation of orchard
5) Increase productivity through quality planting material
6) Increase production of hybrid seedlings
7) Followed organic farming
8) Cover orchard with micro irrigation systems
9) Honey bee rearing to induce pollination
10) Fresh fish brood stock development can be taken up.
11) Organic fish and shellfish farming.
12) Fresh water cage farming will be designed and installed in Nikol bandhara.
13) Hatchery development for shrimp variety can be taken up.
14) Construction of commercial aqua ponds and mass experimental trial can be taken up.

- Rain Water Harvesting by making farm pond/ small check dam and canal construction.

- Establishment of field gene bank of indigenous/exotic germplasm of plantation and fruit crops for future breeding.
- Introduction of new fruit/plantation crop adapted to problematic land. Screening of available germplasm of plantation and fruit crops like Coconut, Aracanut, Mango, Sapota, Guava and Ber for problematic land.
- Development of model for water harvesting, organic farming and reclamation of the problematic soil.
- To develop sustainable and low cost Integrated Pest, Disease and Nutrient management model for plantation and fruit crops.
- To establish processing and value addition unit.
- To find out irrigation technique and methodology for use of saline water in plantation and fruit crops without affecting the yield.
- Strengthening of nursery activities and supply of good quality planting materials.
- Till date farm has near about 100 ha. of problematic soil and priority is given to reclaim the same using appropriate measures in the next five years.
- Planting of mango and coconut will be done in 20 ha. land.
- Shrimp farming training program will be increased as there is huge potential in this district.
- Training in freshwater pond/ cage farming will be conducted to boost fish production.
- Rearing of *Mugilcephal* fish in ponds will be encouraged to fish farmers, as this species is hardy and fast growing.
- Establishment of soil and water laboratory is utmost necessity, to boost aqua farmers.
- Fresh water fish brood stock development can be taken up.
- Shrimp feed formulation, production and marketing can be the best time for ensuring good aqua-production and
- Distribution of wild fish seeds like *Mugilcephalus, Latescalcrifer, Terponjurbua, Scatophagusargus* and shellfishes like *Metapeneauskutchensis, P. monodon*and *P. japonicus*etc to small and marginal aqua-farmers.

Obstacles:

Low man power, Saline/Sodic Soil and Water, Water scarcity in summer season and Problems of wild animals are the major problems.

***ON GOING RESEARCH PROJECTS:**

At present there is eleven research projects are being implemented as main center, with one schemes on Onion as a sub research centre for testing of different varieties in multi-location trial centre. Apart from this, two projects of RKVY are also approved and implemented at this station. The details of the research projects are as under.

***DETAILS OF ONGOING RESEARCH PROJECTS (2019-20):**

Sr. No.	Project Name	B.H.	Starting Year	Objectives and total No. of Experiment
1	Research in Fruit Crops (Non Plan)	5014	1985	- To find out most suitable and low cost production technology in fruit crops. **5**
2	Strengthening of Agro meteorology at JAU (Sub Center) (Plan)	12907	1999	- Establishment of Weather Laboratory at Coastal area for recording weather parameters.
3	Establishment of new centre on Onion Crop (Plan)	12931	2001	- To find out appropriate low cost production technology for onion. Varietal testing for onion and garlic. **2**
4	Centre of excellence for soil and Water Mgt. technology (Sub Centre) (Plan)	12101-04	2005-06	- To determine most effective and low cost water harvesting and irrigation system. **2**
5	Mega Seed Production	18804-03	2006-07	- Production of good quality planting materials and supply to the growers.
6	Strengthening of research in Plantation and Fruit Crops. (Plan)	12586	2008-09	- To find out suitable inter crop for coconut, Introduction of new fruit crops, in situ collection and conservation of Fruit/plantation crops Germplasm. **5**
7	Agro Based I.T.I. for Bhavnagar District. (Plan)	12116-00	2011-12	- Training to farmers for use of micro irrigation system and storage and value addition of Onion.
8	Establishment of Aqua Based Research and Training centre in coastal area of Saurashtra. (Plan)	12016-00	2011-12	- Research and Training on Fisheries. **3**

***Seed /Quality Seedling Production (2011-12 to 2019-20)**

Sr. No.	Name of Crop/Varieties	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
1	**Groundnut (kg)**									
	1) G.G.2 (Breed.)	-	-	-	-	-	-	-	-	-
	2) G.G.7 (Breed.)	-	-	-	-	-	-	-	-	-
	3) GAUG.10 (Br.)	-	-	-	-	-	-	-	-	-
	4) G.G.20 (Gen.)	2410	-	-	-	-	-	-	-	-
2	**Wheat (kg)**									
	Lok-1 (General)	4990	-	-	-	-	-	-	-	-
3	**Coconut Seedling (No.)**									
	1) Dwarf Green	4224	4600	12729	57385	11780	14669	5250	18499	8176
	2) D x T (Mahuva)	1238	3815	4943	10255	4860	2215	2406	7401	14629
	3) Others cv.	2392	8913	7783	12980	9565	6208	12143	27076	28181

***Significant Achievements: Year 2011-2019.**

1: Establishment of Elite Seed Farm:

To fulfill the demand of hybrid coconut a project Under RKVY 2009-10, "Establishment of Elite Seed Farm for Coconut D x T (Mahuva) seed nut Production" for large scale production of D x T (Mahuva) seed nut and seedlings successfully established at this station. Under this project total 1570 plants of coconut cv. Dwarf Green as female and 700 plants of coconut cv. West Coast Tall as Male has been planted during July-2011 and protection has been done by means of cement pole, barbed wire and galvanized iron wire chain link. It is estimated that this farm will produce more than 50,000 hybrid nuts per year from year 2019 and onwards.

2: Farm Development and Farm Protection:

Land Development activity was started from year 2009 and the aim was to bring out the waste land under cultivation. Total 125 ha. of land was made favorable for cultivation by removing babool kant and leveled using dodger and other machineries. Along with this, farm protection activity started and all opened area was protected by means of digging an open canal, cement pole, barbed wire and galvanized iron chain link to avoid problems of wild animals. Near about 6 km boundary area protection has been done and remaining near about 6 km boundary area protection will be done as early as possible.

3: Strengthening of Irrigation facilities:

As this center is mainly working on plantation crop like coconut and other horticultural crops like mango and sapota, "irrigation facilities throughout the year" is the pre requisite for establishment of new planting and maintenance of existing old plantation. Because of Nikol and Malan bandhara (reservoir), there is increase in water availability surroundings to the farm. Hence intensive efforts have been made to utilize this water for irrigation more conveniently. After doing preliminary survey, some points are identified which will supply irrigation water by lifting throughout the year from the reservoir water depending on rain fall. Construction of canal, sump and near about 1000 m network of pipe line was planned and being used to get irrigation water throughout the year easily, economically and permanently. Apart from this, care has been taken for water conservation and water harvesting by making farm pond. In newly planted plots drip irrigation systems installed to save water. During 2020-21 dig out of one pond near elite farm is planned.

4: Produce skilled aqua farmer's:

Fisheries Research and Training centre has initiate in 2011-12 with culturing shellfishes and training cum demonstration. Total 8 brackishwater pond, out of that 4 ponds are of 0.1 ha whereas another 4 ponds of 0.17 ha, whereas freshwater ponds are concern, total 8 ponds, each pond of 0.22 ha. This centre has conducted total 15^{th} five days training programme and certified total 580 trainees. From total around 32% of the trained entreprenure / aqua farmers, almost 185.6 no of participant has constructed their own shrimp

culture business or either in partnership firm or rendering their service as technical persons to aqua farming business.

In the year 2017-18 Hon'ble Collector, Bhavnagar district has allotted around 200 hectors of Govt. kharland / wasteland to active fish farmers/ entrepreneur's, among the total, Fisheries Research and Training Center, JAU., Mahuva station fourteen (14) selected trainees were allotted 3.5 hectors Govt. khar-land/person (total 49 hectors) for shrimp farming purpose at Kotda and Jaswantpara village of Bhavnagar district by the ORDER from the Collector office, Bhavnagar.

In the year 2019-20, our research station has produce 117.5 kg of *Litopenaeus vannamei*in 0.012 ha achieving max. & min individual wt of 31.3 g to 22.3g, whereas in freshwater aquaculture pond, due to COVID-19, market demand was held up and hence we could not harvest our produce Catla, Rohu, Mrigal and Magur fish from the pond.

EXTENSION ACTIVITIES (2019-20):

S. No.	Particular	Date	Number	Faculty
1	Attended and give lecture in farmers training on integrated management of white grub organically at Thorala, Boradi organized by Saraswat NGO	04-01-2019	60	G. S. Vala V. R. Ahir
2	Awareness activity for Agro based ITI courses at Devaliya, Aktariya & Khared	23-01-2019	75	Dr. S.W. Sawarkar S. B. Dhaduk P. D. Ladumor
3	Awareness activity for Agro based ITI courses at Gundarani, Dudhala, Bambhaniya, Bhadra & Bagdana	25-01-2019	123	Dr. S.W. Sawarkar S. B. Dhaduk P. D. Ladumor
4	Awareness activity for Agro based ITI courses at Kumbhan & Nana Jadra	28-01-2019	65	Dr. S.W. Sawarkar S. B. Dhaduk V. S. Bambhaniya
5	Awareness activity for Agro based ITI courses at Konjali, Tared, Otha & Malvav	29-01-2019	116	Dr. S.W. Sawarkar N. M. Kachhadiya S. B. Dhaduk
6	Field visit for student of B.Sc.(Horti) 8th sem, NAU, Navsari under RAWEP	30-01-2019	57	Dr. G. S. Vala N. M. Kachhadiya V. R. Ahir V. C. Dodiya
7	Awareness activity for Agro based ITI courses at Nesvad, Talgajarada, Bhadrod, Katpar & Vaghnagar	30-01-2019	141	Dr. S.W. Sawarkar S. B. Dhaduk
8	Farmers training organized by ATMA-Gir Somnath at ARS, Mahuva	02-02-2019	50	Dr. G. S. Vala A. S. Kotiya V. C. Dodiya

				N. M. Kachhadiya
9	Awareness activity for Agro based ITI courses at APMC Mahuva	02-02-2019	60	Dr. S.W. Sawarkar S. B. Dhaduk
10	Lecture & guidance to farmers in Soil Health Card Awareness Programmes under NMSA Scheme in different villages of Bhavnagar dist.	11-02-2019 to 16-02-2019	536	V. C. Dodiya N. M. Kachhadiya V. R. Ahir V. S. Bambhaniya
11	National level training and demonstration in collaboration with Dr. J. Jayalalithaa Fisheries University, Tamilnadu & J.A.U., Junagadh for skill development on "Healthy Shrimp and GIFT Tilapia Culture Using Biofloc Technology"	14-16th Feb 2019	50	Dr. A. S. Kotiya Dr. G. S. Vala
12	Field visit & information to students of K. B. Parekh College of Computer Science.	19-02-2019	43	V. C. Dodiya
13	Brackish water shrimp farming management training	25-29th Feb 2020	50	Dr. A. S. Kotiya Dr. G. S. Vala
14	Lecture on 'Soil & water testing' in seminar on Onion organized by GNFC	28-02-2019	-	G. S. Vala V. C. Dodiya
15	Field studies and farm visit to the students of Sheth D. M. polytechnic in horticulture college, Vadodara	15-03-2019	23	N. M. Kachhadiya V. R. Ahir T. K. Mandaviya V. S. Bambhaniya
16	Lecture under RAWEP for Students of BFSc, Fisheries college, JAU	23-03-2019 to 26-03-2019		A. S. Kotiya
17	Field visit and information to students of MSW from Pidilite	30-03-2019	07	V. C. Dodiya
18	Field visit and information related to coconut to PhD student from Dept. of Hort., JAU, Junagadh.	04-04-2019	01	V. C. Dodiya
19	Lecture under RAWEP for Students of BFSc, Fisheries college, JAU	13-04-2019 to 16-04-2019		A. S. Kotiya
20	Field visit and information to students of 8th Sem., College of Hort., SKDAU, Jagudan.	06-05-2019	36	ARS (FC), Mahuva staff
21	Field visit to Scientist & team from	08-05-2019	05	V. C. Dodiya

	AAU, Anand and selection of coconut palms for tissue culture			
22	Skill oriented Agro ITI training course in association with Pidilite	15-05-2019 to 14-08-2019	18	ARS (FC), Mahuva staff
23	Field visit to Scientist & team from AAU, Anand	15-05-2019	05	V. C. Dodiya
24	Field visit to Scientist from BioTech, JAU, Junagadh & sample collection of different varieties of coconut & pomegranate for test	17-05-2019	03	V. C. Dodiya
25	Lecture on 'Role of Seaweed as organic fertilizer' at Ghogha under Krushi Mahotsav-2019	16-06-2019	-	A. S. Kotiya
26	Lecture on 'Soil sampling technique, soil testing & efficient use of chemical fertilizers' at APMC, Talaja under Krushi Mahotsav-2019	17-06-2019	-	V. C. Dodiya
27	Lecture at Kukad, Ta. Ghogha under Krushi Mahotsav-2019	17-06-2019	-	T. K. Mandaviya
28	Lecture in khedut shibir at Trapaj under NMOOP scheme organized by DAO Bhavnagar	24-07-2019	30	N. M. Kachhadiya V. S. Bambhaniya
29	Lecture in khedut shibir at Valar under NMOOP scheme organized by DAO Bhavnagar	26-07-2019	35	G. S. Vala N. M. Kachhadiya
30	Lecture in khedut shibir at Bhadrod Ta. Mahuva organized by GGRC Bhavnagar	26-07-2019	30	V. R. Ahir
31	Lecture in khedut shibir at Ayavej, Ta. Jesar under NMOOP scheme organized by DAO Bhavnagar	29-07-2019	35	G. S. Vala V. S. Bambhaniya
32	Lecture in khedut shibir at Pithalpur under NFSM (Nutri. Cereals) scheme organized by DAO Bhavnagar	09-08-2019	40	G. S. Vala N. M. Kachhadiya
33	Field visit & information to team from Pidilite Ind. Ltd., Mumbai	09-08-2019	20	G. S. Vala V. C. Dodiya
34	Field visit & information to students from Gyanmanjari Vidyapith, Mahuva	27-08-2019	110	V. R. Ahir
35	Lecture in khedut shibir at ARS Mahuva organized by DAO Bhavnagar	09-09-2019	30	G. S. Vala T. K. Mandaviya
36	Training under RAWEP for 7th Sem. Students of B.Sc. (Agri.), JAU,	12-09-2019 to	20	ARS (FC), Mahuva staff

	Junagadh	19-09-2019		
37	Attended and lecture in farmer shibir on 'Cotton & lint marketing and price' organized by Pidilite, Bandhutva FPO Ltd., APMC-Mahuva & MCX.	13-09-2019	-	G. S. Vala V. C. Dodiya
38	Coordination of training organized by ATMA Project, Bharuch.	17-09-2019 to 19-09-2019	40	ARS (FC), Mahuva staff
39	Training under RAWEP for 7th Sem. Students of B.Sc. (Agri.), JAU, Junagadh	23-09-2019 to 29-09-2019	20	ARS (FC), Mahuva staff
40	Attended farmer shibir at Vaghnagar, Ta. Mahuva by Pidilite	19-09-2019	65	G. S. Vala V. C. Dodiya V. S. Banbhaniya
41	Coordination of training organized by ATMA Project, Bhavnagar	25-09-2019	50	ARS (FC), Mahuva staff
42	Skill oriented Agro ITI training course in association with Pidilite	11-11-2019 to 10-02-2019	30	ARS (FC), Mahuva staff
43	Attended and give lecture in farmers shibir under the scheme NFSM Pulse at Dundas	21-11-2019	42	Dr. G. S. Vala V. C. Dodiya
44	Field visit & information to students of BRS from Gram Nirman Samaj	24-12-2019	04	V. C. Dodiya
45	Attended state level seminar on Coconut at Mahuva organized by Dept. of Hort., APMC-Mahuva, Coconut Dev. Board & JAU-Junagadh	04-01-2020	250	ARS (FC), Mahuva staff
46	Attended & lecture in state level seminar on Advanced Coconut Farming at Mahuva organized by Gujarat Bagayat Vikas Parisad-Anand, JAU Junagadh, APMC-Mahuva, Dept. of Hort. Gandhinagar and Coconut Development Board Mangrol	11-01-2020	155	ARS (FC), Mahuva staff
47	Training under RAWEP for 8th Sem. Students of B.Sc. (Hort.), Aspee College, NAU, Navsari	16-01-2020	20	ARS (FC), Mahuva staff
48	Farmers Training on Advanced Coconut Farming & Value Addition by ATMA Project, Gir Somnath	28-01-2020 to 30-01-2020	51	ARS (FC), Mahuva staff

HRD PROGRAMME (2019-20):

1. V. C. Dodiya and N. M. Kachhadiya attended training on GeM organized by IT Cell at JAU, Junagadh on 25th Mar., 2019.
2. V. R. Ahir and N. M. Kachhadiya attended training on UG /DIPLOMA helpcentre at JAU, Junagadh on 1st Jun., 2019.
3. V. C. Dodiya, G. U. Koradiya and J. K. Gujariya training on online salary on computer organized by IT Cell at JAU, Junagadh on 18th Jun., 2019.
4. V. C. Dodiya attended CAFT training on "Assessing Soil Plant Atmosphere Continuum (SPAC) for Enhanced Input Use Efficiency" organized by Dept. of Soil Science, Punjab Agril. Uni., Ludhiana (Punjab) during 01st Oct. to 21st Oct., 2019.
5. V. C. Dodiya attended seminar on "Biodynamics in Agriculture" organized by GAAS Anand chapter & AAU, Anand on 09th Dec., 2019.
6. Dr. G. S. Vala, V. C. Dodiya, T. K. Mandaviya and V. S. Bambhaniya have attended state level seminar on Coconut Farming at Mahuva organized by Dept. of Hort., APMC-Mahuva, Coconut Development Board, and JAU Junagadh on 4th Jan., 2020.
7. Dr. G. S. Vala, V. C. Dodiya, T. K. Mandaviya and V. S. Bambhaniya have attended state level seminar on Advanced Coconut Farming at Mahuva organized by Gujarat Bagayat Vikas Parisad-Anand, JAU Junagadh, APMC-Mahuva, Dept. of Hort. Gandhinagar and Coconut Development Board Mangrol on 11th Jan., 2020.

***PUBLICATION (2018-19-20):**

1. Kotiya A.S., Vala, G.S., Kachhadiya N.M., Ahir, V. R. and Dodia, V.C., 2019. Spawning of Spiny Lobster Panulirus polyphagus in the Tanks in Laboratory Condition: A Success Story. Agrobios Newsletter,18(1): 138-139.
2. Kotiya Anil S. and Vala Ghimbhirsinh. (2019). Effect of Borassus Flabellifer Sap (Toddy) on Shellfish Culture Water pH. Agrobios Newsletter,18(4): 133-134.
3. Kotiya Anil S. (2019). Culture of Scylla serrata (Forskal) in Polythein Lining Pond Bottom. Agriculture & Food E-newsletter.
4. Kotiya A.S, KH Vadher, AJ Bhatt and Dave TH (2019). Comparison of proximate composition level in Litopenaeus vannamei cultured in various Stocking density during summer crop in province of Gujarat states in India. Journal of Entomology and Zoology Studies. 7(5): 59-72.
5. Kotiya A.S, KH Vadher (2020). Effect of different stocking density on Litopenaeus vannamei cultured during monsoon season on carcass composition at province of Gujarat states in India. Journal of Entomology and Zoology Studies. 8(2): 1264-1279.

Agricultural Research Station, JAU, Mahuva, Dist. Bhavnagar

Office Staff Position as on 01-05-2020

Sr. No.	Name of Post Sanctioned	No. of Post Sanctioned	No. of post Cancelled	No. of post exist on 1/5/20	No. of Post Filled	No. of Post Vacant
B.H. : 5014 Research in Fruit Crops (Non Plan)						
1	Assoc. Res. Sci.	1	0	**1**	1	0
2	Asstt. Res. Sci.	1	0	**1**	0	1
3	Agril. Officer	3	2	**1**	0	1
4	Agril. Supervisor	2	1	**1**	1	0
5	Agril. Assistant	6	1	**5**	5	0
6	Head Clerk	1	0	**1**	1	0
7	Senior Clerk	1	0	**1**	1	0
8	Junior Clerk	2	0	**2**	1	1
9	Tractor Driver	2	1	**1**	0	1
10	Peon	1	0	**1**	1	0
11	Mali/Watch man	2	2	**0**	0	0
12	Guard	3	2	**1**	1	0
13	Farm Labour	8	8	**0**	0	0
14	Khet Majdoor	57	45	**12**	10	2
15	Goval	1	0	**1**	1	0
16	Security guard	10	6	**4**	4	0
	Total	**101**	**68**	**33**	**27**	**6**
B.H.: 12586 Strengthening of Research in Plantation and Fruit crops (Plan)						
1	Res. Scientist	1	0	1	0	1
2	Asstt. Res. Sci.	4	0	4	1	3
3	Agril. Officer	3	0	3	3	0
4	Agril. Assistant	1	0	1	1	0
5	Mali /Peon 2+1	2+1	3	0	0	0
	Total	**12**	**3**	**09**	**05**	**04**
B. H.: 12116 Agro Based ITI (Plan)						
1	Associate Professor	1	1	0	0	0
2	Agri. Officer	1	0	1	1	0
3	Agri. Asstt.	1	0	1	1	0
	Total	**3**	**1**	**2**	**2**	**0**

Agricultural Research Station (Fruit Crops)
Junagadh Agricultural University, Mahuva, Dist. Bhavnagar.

Statement showing Expenditure (Rs.) of last nine years (2011-12 to 2019-20)

Sr. No.	Year	Budget Head												Total (Rs.)
		5014	5002	12931	12101-04	18804-03	12586	9510-J13	18004-10	12116	12016	12907	18004-16	
1	2011-12	13806987	1933773	295212	274053	256236	6471014	1640000	1376631	199901	1378362	-	-	27632169
2	2012-13	11778565	-	289711	303416	314345	6872341	-	-	1935809	1545803	-	-	23039990
3	2013-14	14220842	-	359232	388335	207424	8896678	-	-	1442125	1611835	-	-	27276194
4	2014-15	12637886	-	1639676	999608	232062	6459324	-	-	1893631	2276798	199870	-	25738855
5	2015-16	133311756	-	599999	569996	28000	6356227	-	-	2720706	33999948	301707	-	27859501
6	2016-17	11857573	-	1095493	539712	355130	7197337	152760	-	2556602	2093489	429189	-	26277285
7	2017-18	14816448	-	556745	399721	256442	10514010	290270	-	2994963	1691417	199044	-	31719060
8	2018-19	15303131	-	599931	1173313	1085660	9016370	-	-	5532397	1785884	139832	97500	34734018
9	2019-20	15188421	-	555873	581724	2609399	9808416	-	-	2881044	1475979	153313	-	33254169

Statement showing Income (Rs.) of last nine years (2011-12 to 2019-20)

Sr. No.	Year	Budget Head												Total (Rs.)
		5014	5002	12931	12101-04	18804-03	12586	9510-J13	18004-10	12116	12016	12907	18004-16	
1	2011-12	921848	43075	7206	4166	669717	1400	1723456	-	-	-	-	-	3370860
2	2012-13	760108	-	-	-	385259	-	1932036	-	13010	-	-	-	3090413
3	2013-14	1783936	-	-	97919	270875	100085	-	-	-	4800	-	-	2257614
4	2014-15	1534503	-	-	-	452850	-	-	-	13150	5037	-	-	2005540
5	2015-16	1558313	-	-	-	1440075	-	-	-	-	-	-	-	3040882
6	2016-17	2120799	-	-	-	728802	36117	507992	-	11550	6726	-	-	3411986
7.	2017-18	1784972	-	-	-	826358	349070	892028	-	156280	88792	-	-	4097500
8	2018-19	2775075	-	21420	-	3401967	273490	279074	-	245320	103250	-	-	7099596
9	2019-20	3286828	-	63615	-	3678321	675770	1670725	-	110100	41330	-	-	9526689

Note: Income and Expenditure are up to “March End” for the respective year.

ACHIEVEMENTS:

VARIETIES RELEASED/RECOMMENDED and IRRIGATION CANAL CONSTRUCTION

DWARF GREEN 1982

D X T (MAHUVA) 1995

T X D (MAHUVA) 2006

NICOLBANDHARA CANAL 2001

Coconut germplasm at ARS, Mahuva

High density planting in Mango (3ha.)

Elite farm seed production

EXTENSION ACTIVITIES BY RESEARCH STATION

State level Seminar on Coconut at Mahuva organized by Dept. of Hort., APMC-Mahuva, Coconut Dev. Board & JAU-Junagadh

Farmers Training on Advanced Coconut Farming & Value Addition by ATMA Project, Gir Somnath

State level seminar on Advanced Coconut Farming at Mahuva

Fisheries Training

Visit of Hon'ble VC., Dr. V.P.Chovatiya at ARS Mahuva Dt.: 04/01/2020


04 01 2020

Fisheries Research & Training Center, JAU, Mahuva in collaboration with Tamil nadu Dr. J.J. Jayalalithaa Fisheries University has conducted three days training on "Healthy Shrimp and GIFT Tilapia Culture Using Biofloc Technology" from 14th to 16th Feb 2019.

Stocking and sampling of *L. vannamei* shrimp seeds in experimental pond at Katiyapir area of Plantation farm.

Harvesting total 117.5kg of 31 count *L. vannamei* shrimps from culture pond.

Sampling of shrimp and application of medicines

Harvesting of *L.vannamei* shrimp and size of shrimp at harvest

Random sampling of shrimp for biometric study

Coconut seed production