Chapter 2

PRESENT STATUS OF FISH DRYING IN KERALA
2.1. Introduction

Kerala coast has 3 major fish landing centres namely Kollam, Ernakulam and Calicut (Anon 1969). Fish catches contain quality fishes, which brings high revenue to the state. The export-oriented industry needs quality fishes like prawn, squid and cuttle fish. The seafood export industry survives on these items. The low quality fishes like ribbonfish, lizardfish, anchovies and trash fish are also fishes, which are to be better utilized. These fishes also have all nutritive and mineral value and bring revenue if processing and preservative methods are improved. The most common practice of anti oxidizing such fish is through preservation by drying and curing. The production, profit and economics of anchovies and shark in small scale units were reported by Balakrishnan (1981) at Thiruvananthapuram region. Suseelan (1984) studied the economic feasibility of sun drying of ribbonfish and anchovies.

2.1.1. Packaging

Fishes are bulk packed using palm or coconut dried leaves usually called as 'vallum', contain 15 to 20 kg and are easy to handle. It is observed that polyethane bags containing 100gm packs sold in city have good acceptance. Antony et al. (1988) and Gopakumar (1996) reported that dried leaves of coconut and palm and jute bags are used for bulk packing and transportation of dried fish. Prabhu & Gopal (1990), Antony et al. (1988), Kumar (1990) reported the various packing materials like papers and paper boards, cellophane, plastics, vinyl films, metalised plastics and aluminium foils. Low-density polyethylene bags are widely used for packing dried fish due to low cost, transparent quality and better appearance (Antony, 1990). According to Prabhu & Gopal (1990) Low density polyethane or polypropylene are commonly used to pack the dried fish due to its low cost, ready availability, good tearing and bursting strength. The dried fish products in Integrated Fisheries Project are packed in 200 gauge polyethane bags with some instruction to handle the fish in 100 gm, 200 gm, and 500 gm packages.
2.1.2. Storage and storage facility of product

Storage of dried fish products are a risky job. The people in coastal region sell the product when they get a little improvement in price as the cured or dried fish spoil in a short period resulting in revenue loss. So fish has to be stored in a protected area under hygienic condition. The spoilage of fish will adversely affect profit of the processors, traders and consumers. So principles of good quality storage practice are important. This depends on climate, local practice and type of the product to be stored. Yet there are some important basic requirements of storage practice and design of package. The store should be away from fish processing and heavy contamination area. It shall be in a dry and water and wind proof area. Good ventilation will reduce mould growth by preventing moisture up take by the fish and it should not permit the entry of flies, rodents and birds. All packaging materials must be clean and checked for insect contamination. 'First come 'first out' should apply to stored product and 'dead' areas in the store (zugarramurdi et al., 1993).

2.2. Aim

This chapter is aimed to assess the following:

To study,

- The economically important fishes used for curing and drying process by the local fishermen.
- The low value fishes and by catches used for curing and drying process by the local fishermen.
- The practical problems associated in fishermen work for better handling, quality control, and products development.
- Approach towards govt. support expected.
2. 3. Materials and Methods

Three major landing centres in different coastal districts namely. Neendakara and Sakthikulangara were considered as one centre in Kollam district, Munambam in Ernakulam district and Puthiappa village in Calicut district were selected for the study. A questionnaire, which is a modified version as developed by Balasubramaiam & Kaul (1982) and Kaul & Balasubramaniam (1985) were used for collecting information. A questionnaire (Annexure A) was used to collect data from 8 major fish drying plants and 4 minor plants at Munambam, 10 major plants and 5 minor plants at Quilon and 10 major plants and 5 minor plants at Calicut. In addition to the information collected through questionnaire they were also asked to add purchase or sales information in quantity wise and the price of various products in every week. The weekly purchase and sales value was calculated as monthly average. This was collected for the years 1997 – 98 and 98 – 99. The average purchase and sales values were estimated. The major products considered for the study were mackerel (*Rastrelliger Kanagurta*), ribbonfish (*Trichiurus* sp), shark (*Scoliodon* sp), anchovies (*Stolephorus* sp, silver belly (*Leiognathus* sp), malabar sole (*Cynoglossus* sp), sardines (*Sardinella longiceps*), lesser sardines (*Sardinella gibbosa*), lizardfish (*Saurida tumbil*) and kilimeen (*Numipterus* sp). The plants cure more than 75,000 Kg / year was considered as major plants and less than the quantity is considered as medium plants.

2. 4. Results

2. 4.1. Quilon Centre (Major Plants)

Information collected through questionnaire shows that there are about 108 fish curing units in and around Quilon centre. There are a number of small curing units available in the region which operate on the quantity and cost of fish landed. The fisherman aims only on the export quality fish considering their share. Only one shark curing centre is run by an INP trained person. 75% of the owners have their own curing
yards, 25% are rented or leased. 25% have electricity and all other facilities like water supply and curing tanks but others have only curing tanks. Curing tanks were arranged in the sides of the houses. They do not have any technical persons other than the owner and majority of workers are owner’s relatives. There are no permanent employees. They are engaged on casual or contract or piecework basis. Only during peak seasons they engage more people and are paid Rs. 70 – 80 per day. Usually they take auctioned fish and transported through head load or autos. The fishes were salted immediately. They use 1: 4 to 1:6 ratio of salt to fish and the salting time depends on the demands of cured fish. The gills and intestines in small type fish are not removed. Big type fishes are cleaned, washed before salting and arranged in layer by layer. About 75% of the curing sheds are thatched, with coconut leaves. They use corporation water and there are water problems during March to April.

Crystal salt from Tuticorin is used instead of powder or sterilized salt to reduce the cost. The cemented or wooden tanks having the capacity of 250 to 1,500 kg were used. No preservatives are added during or after salting of fish. They wash the fish in self-brine and sun dried for 1 or 2 days on coir mats depending on demands. The yield of mackerel is 75 to 88%, ribbonfish 72 to 83% and shark 65 to 72% (Anon 1984). The packing was carried out in coconut leaves at a cost of about Rs. 4/- ‘kuttai’ and they store for 3 to 4 days only. The storage period was less and there was no report on the formation of pink or dun on the products. They inspect the quality of their product right from production to sales. Their experience and family background are their added merit and run the plant without any technical hand. They follow their own method and their concept regarding quality is good colour and appearance of their product, which in turn gives movement of the products. Their profit is around 5 to 7% per annum of fresh fish purchase value. The plants are not registered under any State or Central departments or
co-operative societies act. They sell the products to agents as per the market demands. No Central or State govt. helps them in their work providing sufficient loan etc.

The average percentage of fish handled by major plants during the year 1977 to 98 and 1998 to 1999 are as follows. The total average fish handled was 1,67,920 kg and value was Rs.14,12,782/-. The total sales quantity was 1,27,750 kg and value was Rs 18,06,546/-. The average purchase and sale of fish in varieties and value and in percentage composition of the same in major plants are in figure – (2.1. & 2.2.). The samples collected in this centre were mackerel, ribbonfish and shark. Mackerel had 0.01%, Ribbonfish had 0.08% and shark had 2.05% insoluble ash and 4.2x10^3, 3.3x10^3 and 3x10^3 total plate counts respectively.

2.4.2. Medium Plants

They cure and sun dry the fish in their own land at the side of their house (Anon., 1984). They do not have any separate facilities and capacity of the curing tank is about 250 – 1,000 kg. They adopt salting, drying, storing and packing methods as in major plants. The workers are their family members and they work without any fixed hours on request. They do not keep fish for long time because they have to pay their loan in time and sell them through brokers. The brokers who lend amount may reduce the price. So their expected profit is very much less than the major plants. No work during lean season. Their annual turn over was less than Rs 50,000 to 70,000/- per annum and profit was around 3 to 4 %. Above all, they only care about colour of the product. Fish curing and drying methods are the same as in major plants and they are not supported by any Central or State agency.

The total average quantity handled was 62,725.5 kg valued at Rs 4,34,250.4/- and the sales quantity was 52,804.5 kg having the value of Rs 4,93,876.4/- during the year 1977 to 1998 and 1998 to1999. The average percentage quantities of different variety of fish handled by the medium plants are mackerel, ribbonfish, priacanthus,
sardine, lesser sardine, silver belly, anchovies, lizardfish and kilimeen. The sale composition shows that only sardine had little increase and remaining are equal to purchase composition. The average purchase and sale value depend on the availability and high cost (Figure – 2.3. & 2.4).

2.4.3. Workers

Studies showed that 80% of workers are above 35 years and belong to the Christian community. They earn an average of Rs 40 to 45 per day and have no work during off-season. They get only 100 to 130 days work per year and most of them do not have any entertainment facility. Most of them are forced to work at the lower rate because there is no other work for income. They do not have any separate trade union to deal with their problems.

2.4. 2.1. Munambam centre (Major plants)

About 105 fish curing centres are available and 75% are in their own land and remaining is leased land. 50% have separate office and there is no separate ice or dry fish storage. The electricity used for the house is extended to the curing yard. They have 8 to 10 cents of land. No permanent staff for office or technical side. The casual workers are engaged continuously and strength increases during peak season and decreases during off-season. 25 days work are noted during peak season per month and is less during off-season. Their duty hours were normally 9 am to 5 pm. Female workers get Rs. 70/- to 80/- per day and male workers get Rs. 120/- to 150/- per day. The curers are from different religion and caste like christian, vala and araya. Majority of plants do not have any work during off-season.

Majority of fishes are landed at private fishing harbour than the fishing harbor run by the government. They salt fish as soon as it reaches the station. They use corporation water and water is less during March and April. They remove intestine of the larger fish like mackerel, ribbonfish, shark and lizardfish. Some time they use semi
spoiled fish also and dry salting is preferred in the ratio of 1: 4 to 1:6 salt to fish depending on the nature of salting. They have 5 to 7 cemented tanks having capacity of 500 to 2000 kg and use salt from Tuticorin. Salting time depends on the demand of cured fish and extended up to months. Normally cured fishes were washed in self brine and some excess salt was added before packing. Drying was done in special case only, by spreading cured fish on mats. The yield of mackerel was 75 to 78%, ribbonfish 80 to 82% and shark 65 to 70%. In most cases, cured fish is packed in coconut leaves. 3 pieces of coconut leaves cost Rs 7/- and store for one or two days depending on the arrival of broker. There is no possibility of formation of pink or dun. They gained knowledge and experience from their family and they check quality at every stages of processing. They are not trained and not adopting any standard method as approved but following their own methods. They have the view that quality means appearance and colour of fish. They are not registered with any of the Central or State Govt. organization for any guidance. They market their product through brokers to Alwaye, Changanacherry, etc. They do not have any quality control laboratory.

The average fish purchase in major plants was 2,15,145.5 kg valued at Rs. 22,52,778/-. The sales quantity was 2,21,225 kg of Rs 39,22,752/- during the year 1977 to 1998 and 1998 to 1999. The purchase had following composition of fishes - mackerel, shark, ribbonfish, sardine, lesser sardine, silver belly, anchovies, lizardfish, kilimeen and malabar sole. The purchase and sales values are represented in figure (2.5 & 2.6). The samples collected show the following percentage of acid insoluble ash and TPC 4.08% and 7 x 10^3 in mackerel, 0.296% and 9.02 x 10^3 in ribbonfish and 3.91% and 6.02 x 10^3 in shark.

2.4.2.2. Munambam (Medium plants)

The plants have separate curing tanks and no other facilities available. They have 5 to 7 cents of land. The owners play all roles with family members and rarely
employ casual workers. The work continues until it is finished. Salting, drying, packing and storing are as in the case of major plants. 80% of the owners associate with fishing and allied activities during off-season irrespective of community and 20% continues in fishing. They have good demand for cured fish during April to July. Usually cured fish exhaust before monsoon as they sell them before monsoon to remit loan amount and they are not able to get good profit. They do not have sufficient money to purchase fish. The expenditure is between Rs 50,000/- to 70,000/- and their profit is between 3 to 4% of the turnover per annum. They do not keep any records for reference. They use corporation water. They use fresh or semi spoiled fish for curing, as cost will be less. The crystal salt from Tuticorin is used. The capacity of the salting tanks and their number are less than major plants. The dry salting system is used and salting time depends on the demand of products.

The average purchase of medium plants was 64,903.5 kg of Rs 5,64,906.4/- and the sale quantity was 53,276 kg valued at Rs 5,68,158/- during the year 1977 to 1998 and 1998 to 1999. The following fishes were sold; mackerel, ribbonfish, shark, priacanthus, sardine, lesser sardine, silver belly, anchovies, lizardfish and kilimeen (Figure – 2.7 & 2.8).

2.4.2.3. Workers

The workers are over 35 years except in case of some families. Majority are illiterate and some studied up to 5th standard. They have more than 10 to 12 years experience and have no work during monsoon season. Yet, out board engine bring fish but not as much as the peak season. They get a salary of Rs 60/- to 80/- per day and get more than 200 days work in a year. 40% of the workers have entertainments like television and the remaining have radio or newspaper. They continue to work because they have no other work. They do not have any trade union activities.
2.4.3.1. Calicut (Major plants)

About 100 fish curing units are available in the village near harbour. 50% people cure the fish in their own land and 25% are on leased land. Only 25% have office. Unlike Quilon or Ernakulam they have separate curing place at sea shore. The cured fish were dried on mats on sand at sea shore. 50% units have electricity and separate store and others do not have it. No permanent workers for any nature of work in the office or yard. In some plants, there are some permanent casual workers, continue for years together as they have no other work. During peak season owners admit a good number of casual workers according to the in take of fish. But during off-season they reduce them to 3 to 5 nos. During peak season workers get 24 days work and get Rs 2600/- per month. Some works are handled in piece-work basis and relatives were also engaged for this purpose.

They purchase fish through auction and transported to the plants through autos or mini lorry. Many units are engaged in this field through the experience gained from their family. The community mostly engaged in this field is Araya. The peak season for dry fish is usually from April to August and heavy demand is from Malappuram, Trichur, Palghat and Kunnamkulam markets. The annual expenditure goes up to Rs. 1 lakh to 2 lakh per annum with a profit of 5 to 7%. Only 35% plants keep some records. The curing plants are huts with clay and coconut leaves. 50% use potable water and others use seawater (Balasubramaniam & Kaul 1982). About 25% add chlorine or bleaching powder in water to chlorinate the water. All medium type fishes are cleaned without intestine and blood vessels and washed before salting. They use fresh or semi-spoiled fish (Balasubramaniam & Kaul, 1982) for curing and check the quality by experience. Crystal salt from Tuticorin is purchased and 1:4 to 1:6 ratio of salt and fish are used for salting. Neither wet salting is practiced nor sterilized salt is used. They use wooden tank or clay
pot or cemented tanks having capacity of 100 to 1000 kg. Salting time depends on demand of the cured fish and usually it continues from 5 to 6 hours to 3 to 4 months.

They use calcium propionate of 0.3 to 0.5% as preservative of cured fish and keep it as trade secret and this was taught by Central Institute of Fisheries Technology, Calicut centre. They do not cure shark because fresh shark costs high price of about Rs 90/- to 100/- per Kg. Fresh shark is transported to Calicut market, after sales the remaining quantity is cured and dried. Unlike other places, fishes are specially dried and packed in polyethylene bags and sealed and marketed. The quality means appearance and they think it is a good motivation for buying. They are not registered with any Central or State Govt. agencies or departments. The average purchase quantity was 2,17,546.9 kg of Rs.16,91,898/- and the sale quantity was 1,71,223 kg of Rs 21,53,067/- during the year 1977 to 1998 and 1998 to 1999. Mackerel, ribbonfish, malabar sole, sardine, lesser sardine, silver belly, anchovies, lizardfish and kilimeen contribute major quantity (Figure - 2.9 & 2.10). The sample collected had insoluble acid and TPC as 10.67% and 7.8 x 10^3 in mackerel, 8.32% and 9.2 x 10^3 in ribbonfish and 0.29% and 6.5 x 10^3

2.4.3.2 Calicut (Medium plants)

They have curing sheds constructed with coconut leaves and dry the fishes on mat or net on seashore. They work as a family and only during peak season they engage casual workers and some works are carried out on piecework basis. During off-season they have no work. During peak season they work 24 days. Mostly they have no fixed working hours and the work will be continued until it finishes. Owners and family carry out works. So sharing problem will not arise. Usually low cost fishes are purchased through auction and transported to centre by autos in 10 to 15 minutes. They get 3 to 5% profit. The financial conditions do not permit them to keep cured fish for long time, i.e., up to off-season when the dried fish have more demand. 65% use potable water or seawater directly and the remaining use chlorinated water for cleaning and salting
purpose. Crystal salt from Tuticorin was used for salting. Dry salting is mostly practiced and salting time depends on the demands of cured fish up to several months. Since the products were sold at once there is no spoilage noted. They check the quality of the products at every stage and giving more importance to colour and appearance. They sell the product through brokers. The average purchase quantity was 67,535.9 kg and value was Rs 4,58,979.7 and the sale quantity was 52,010kg and sales value was Rs. 5,05,507.6 during the year 1977 to 98 and 1998 to 1999. The composition of fishes composed of mackerel, ribbonfish, malabar sole, sardine, lesser sardine, silver belly, anchovies, lizardfish and kilimeen (Figure – 2.11 & 2.12).

2.4.3.3 Workers

The workers are of 28 to 45 years. About 50% attended middle school level and the remaining are illiterate. They are from fisherman community and can read and write. Balasubramaniam & Kaul (1982) reported that majority of the fisherman community are educationally poor and financially backward. They work for years and residing with in the radius of 3 km. Their monthly income is Rs 2500/- and they are granted incentive during festivals and get 22 to 25 days work in a month during peak season. Television and newspaper as their sources of entertainment. There is no separate organization to work for them for solving their problems.

2.5. Discussion

The centre showed 23.92% loss in sales quantity than purchase quantity and this may be due to weight loss during salting and subsequent changes. The sales value showed 27.87% profit than purchase price. Most of the fishes used are demersal fishes (Anon., 1984). They got profit from ribbonfish, shark and anchovies and more profit from shark as reported by Balakrishnan (1981) and Suseelan (1984). Suseelan (1984) stated that sun drying is more economical and profitable even for internal marketing and remaining products had equal or less profit. So the loss from one product was adjusted
from other products. This is due to the market effect and other factors. The report showed that the export of dry fish is less due to less production (Gopakumar & Devadasan, 1983). According to the workers, they are less paid than the workers in freezing companies. Results from medium plants showed that sales quantity was 15.81% less than the purchase quantity and the sale value was 13.73% more than the purchase value. This is due to the weight loss during salting process. The centre had profit. The mackerel and anchovies had high share of profit. The remaining had less or equal status. The comparative profit showed that major plants have more profit than medium plants. This is due to the fact that major plants had more financial commitment such as capacity, number of tanks etc. than the minor plants as reported by Kaul & Balasubramaniam (1985) and lesser investment would likely be taken as a way of life rather than economic enterprises (Firth, 1946), cited in (Kaul & Balasubramaniam, 1985).

The sale in the major plants at Munambam showed that sales quantity was more than the purchase quantity by 2.83%. The additional quantity should be from the previous year is unsold product. The sale value was 74.12% more than purchase value. The major plants have the facility to store product. The data showed that purchase price of raw fish was less during the landing season from August to January. The price increased during remaining period. According to statements of fisherman they get all type of fish at every season but quantity and size will be less. They take all type of fish for curing irrespective of sizes. Here the quantity purchased was sold without much loss. Mackerel, ribbonfish, sardine, lesser sardine and anchovies bring only marginal profit and shark bring more and the other fish bring no loss no profit. This shows that the arrival of fishes from out side market cause diminishing profit to the processors. The medium plant results showed that sales quantity was 17.92% less than purchase quantity and the profit was 0.57%. The loss in quantity is due to the salting loss. The
purchase and sales composition shows that they are same and only marginal difference in ribbonfish. The increase or decrease of purchase and sales in other variety of fish affects only marginally. The percentage value showed that mackerel has less sales effect and ribbonfish more. Shark and lizardfish have less effect than purchase and the remaining have equal effect at purchase and sales. The difference in purchase and sales value of certain fish showed that entry of out side fish affects sale price of local market. So less profit was achieved. The lizardfish always maintained medium value in purchase and sales.

The results at Calicut showed that average percentage sales of fish in the period had 2.13% less in sales than purchase. This showed that plants sold the previous year stock during this year. The sales value increased 27.26%. Mackerel maintained low percentage at purchase and sales and may be due to the previous year stock. The purchase and sales value are maintainable in all cases. The purchase and sales value showed that ribbonfish and lizardfish had more value than others and kilimeen had lesser sales value. Financial loss in one product was maintained by other. There was good demand for anchovies, ribbonfish and mackerel. It was observed that fishermen adopted the preservative technique from Central Institute of Fisheries Technology (CIFT), Calicut. Medium plant result showed that there was 22.99% weight loss in salted fish than purchased fresh fish with a profit of 10.47%. The weight loss during salting is an important factor. Being medium plant sale of earlier year stock was not possible. The important items of profit were malabar sole and anchovies. The products earned neither loss nor much profit. They have not adopted any management technique and financially and educationally also they are poor.

The study showed that financially sound persons only can preserve cured fish long time until the monsoon season, when the demand for cured fish is high. During monsoon season landing of fresh fish is less and there is a ban for fishing. So persons,
who have sufficient stock can sell fish at high rate and can make profit. Poor people cannot wait until this chance, as borrowed money from commission agents (Anon., 1969, Singh & Gupta, 1983) has to be paid with interest. So they sell the product at a lower rate.

The fish purchase rate in all 3 centres shows that the rate is low from September to January in case of mackerel, ribbonfish, lesser sardines, kilimeen, and sardines. Landing of shark starts from December to April and also anchovies and silver bellies. The landing of lizardfish and lesser sardines may be small in size in all season except during ban period. They expect loan from banks or Govt. as over draft to purchase fresh fish for salting and the loan amount will be remitted in installments. Financial support to units are complicated as most of the plants are unhygienic and do not have sufficient arrangements such as records, office, storeroom, electricity, quality control room and equipments. Roof made out of coconut leaves cause falling of rain water in curing tank and spoil cured fish. There is no proper drainage system and fishes were dried in the courtyard of houses. The study showed that less than 1% people use preservative in Kerala and that too only at Calicut centre.

Problems & Quality Assurance

No plants in any centre have any quality control laboratory to assure the quality of products. The Govt. is also not very serious about the situation. Corporation or Panchayat authorities only care for taxes but not on hygienic condition of products. No certificate was issued to assure quality with the product. All assure that their products are good. The study showed that no plants export their product but only do the internal marketing to the interior places. The State Fisheries Department has to provide the minimum facilities available and grant financial assistance for improvement.

Curing yards have little concern on maintaining quality. They do not take care in handling and packing of fish. Since salting, washing, drying and packing are done in
open place, fly, sand and mud particles are easily attached to the products. The cured products are simply handled without any care. The plants do not have any required facilities. The products have high content of salt during drying and have white salt crystal on the fish. MPEDA and State Fisheries Departments may provide technical assistance to the curers in preparation of quality and hygienic products as in the freezing plants (Rao & Prakash, 2000). The State Govt. may take steps to popularize the products through stalls.

The labour system is not protected because the work is seasonal. The fishermen at Quilon depend on the quality fish and they do not bring trash fish and by catch fish for curing. So works in the curing units are affected. Since most of the women are engaged in curing, Govt. may train them in hygienic production of dry cured fish through societies. The labourers are not cared by the Govt. as they have no chance to bring their negligence to the attention of the authority. The employees may be granted EPF and other benefit as other workers in factories by registering the units under State Govt. Department. So the present system may be reviewed to grant better benefit to employees with out affecting the fish curing units.

The Govt. may grant aids to curing units to improve quality of cured fish and may help them to provide loan to purchase fresh fish during peak season, which may be repaid after sales of cured products. The quality of products may be checked either by Govt. authorized laboratory before purchase and sales or Govt. may help curing units to set up a quality control unit in the plants. Further the Govt. may purchase cured fish from curers and market to interior places of the State at low cost than private sector people. The low quality fish are sold at lower rate due to carelessness of the marketing people. The Govt. may set up societies for purchase of cured fish and arrange trained fish quality inspectors to check the quality of dried products before purchase and sales. The MPEDA may register curing plants and provide financial support to them to purchase
fish at peak season at a lower interest rate as in the case of the processors and exporters of frozen fishes (Rao & Prakash, 2000).

The Kerala festivals like Onam affect the sale of cured fish as reported by Gupta et al. (1983). During these period people take only vegetable and demand for cured fish and dry fish is less. During fasting seasons like Ester, Bakrid or Ramsan and Sabarimala people prefer only vegetable and demands for the fish is reduced. When fresh fish is available at low cost the people will normally prefer fresh fish only. This affects the sales of cured fish and the cost.

Trained technician are the important need to curing units to produce good quality cured product. The fisherman may be trained for the purpose. They may be trained to prepare good quality product with in the adequate time and use sterilized salt. Further the Govt. may help the fishermen forum or the society to purchase the fish and market the same with passing of quality check. This may be sold through society to interior part of the State at low price. Storage of the dried products are an important problem as reported by Gupta et al. (1983) because during rainy season relative humidity of the atmosphere is high and air contain more water molecules. So it is easy to the salt contained fish to absorb moisture from air and speed up the formation of dun and pink. Further during summer season fish may over dry due to the absorption of moisture from fish to the atmosphere. So the storage of the products needed a closed temperature and relative humidity to keep the products safe to increase the shelf life.
Figure – 2.1. Average purchase and value and both in % composition and in major plants at Kollam centre
Figure 2.2. Average sales and value and both in % composition in major plants at Kollam centre.
Figure – 2.3. Average purchase and value and both in % composition in medium plants at Kollam centre
Figure 2.4. Average sales and value and both in % composition in medium plants at Kollam centre
Figure 2.5. Average purchase and value and both in % composition of major plants at Munambam centre
Figure – 2.6. Average sales and value and both in % composition of major plants at Munambam centre
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Figure – 2.10. Average sales and value and both in % composition of major plants at Calicut centre
Figure – 2.11. Average purchase and value and both in % composition of medium plants at Calicut centre
Figure - 2.12. Average sales and value and both in % composition of medium plants at Calicut centre