ROLE OF FISHERWOMEN IN COASTAL ECO-SYSTEM OF ANDHRA PRADESH, KARNATAKA, KERALA AND TAMILNADU - AN OVERVIEW

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Abstract

The contributions of the fisherwomen penetrate every aspect of post-harvest handling, preservation, processing and marketing of seafood products and provide an intergral link between producers and consumers. Increased competition, declining resources and difficult working conditions make their work challenging. Women, who constitute approximately half of India's population, play vital role in the operation of the fisheries and their continuing growth as a component of the agriculture sector of the economy. The assessment of the socio economic status indicated that very few households (15.41%) maintained livestock for income generation. About 60 per cent of the fisherwomen carried out post-harvest activities to earn income. Food expenditure comprised 60.68% of the earned income contributing to the major share of the spending. Debt servicing was serious problem faced by 44.9% of the respondents who had availed loans mostly from non-institutional sources. Much of India's national food security rests on the shoulders of its fisherwomen. Affording comprehensive care for these women is correct in principle and a practical necessity if India's fisheries sector is to be satisfactorily sustained and the fisher women empowered, both socially and economically. This can only be done through education about nutrition, health, sanitation, and child care, and training on current technologies and best practices techniques. Education materials viz., CDs, Flash Cards, Pamphlets, Brochures and Folders on health and hygiene, disaster management and income generation activities developed to create awareness. Two equipments namely Low cost ice Cream Freezer and multipurpose fresh fish vending and display table fabricated, received patents and licenced the technology to an woman entrepreneur.

Introduction

Women play a key role in the development of fisheries sector in addition to their role of sole household managers in most fisher families. Although the involvement of women is limited in capture fisheries, their supportive role in active fishing has increased manifold with the advent of mechanisation and enhancement of multi-day fishing in marine fisheries. The upcoming of women into the labour driven segments of fishing sector has increased over the years. This is attributed to the overall development of aquaculture and increase in the exports of marine products. The occupational pattern of women has further undergone a structural change with the shift from net mending to fish marketing and processing. The irregularities in the earning pattern

of their men counterparts, coupled with need for livelihood sustainability, forces most of the women to earn from a variety of fishery related activities.

India is endowed with a coastline of 8,129 kms with 3,638 fishing villages. About 5 lakh women are involved in the post harvest sector of marine fisheries. The fisheries sector has provided an export earning of about Rs.7000 crores during 2002-03 to the country's exchequer. Though the statistics regarding the geographic distribution of fresh and brackish water areas suitable for aquaculture is available, there is a dearth of quantitative data regarding the employment, production and earnings of women in different segments. The brackish water area alone suitable for aquaculture is 1.12 million ha in which hardly 10 percent is currently utilized. Besides, the fresh water resources of rivers and canals of 1.71 lakh km, reservoirs of 2.05 million ha, ponds and tanks of 2.86 million ha, beels, oxbow lakes and swamps of 0.79 million ha, also offer immense scope for fisheries development and enormous employment opportunities to women. The seasonal nature of employment in the fisheries sector displays a distorted picture about the per capita earnings of fisherfolk and this is quite correlative with their poverty status. The problem is more acute for the women stakeholders mainly due to the prevalence of wage disparities favoring men. It is a widely accepted fact that poverty has a gender bias, as 70% of the people living in abject poverty are women (Dehadrai, 2002). It is reported that women perform 2/3rd of the world's work, receive only 10% of world's income and own only one per cent of the total assets (Ashaletha *et.al*., 2002). Although women contribute in all spheres of development both at micro and macro level, it is not appropriately quantified or recognized. The present paper attempts to discuss the role of women in capture and culture fisheries in marine and inland sectors and their contribution in post harvest activities of processing and marketing.

Materials and Methods

The primary and secondary data collected under the National Agricultural Technology Project, "Studies on Fisherwomen in Coastal Ecosystem of Andhra Pradesh, Karnataka, Tamil Nadu and Kerala" has been liberally utilized for the present analysis. The study was undertaken during September 2001 to December 2003 in Peninsular India, constituting the maritime states of Andhra Pradesh, Karnataka, Tamil Nadu and Kerala. A preliminary survey was conducted in the entire coastal belt of all maritime states to identify the villages where women are predominantly employed in one or other identified fisheries activities. A total of 29 villages are selected (Table-1) and detailed study is conducted.

Table 1. Names of Selected Villages.

Andhra Pradesh	Karnataka	Kerala	Tamil Nadu
Uppada	Gangolli	Aroor	Pulicat
Dummulupetta	Thottam	Anjilickadu	Pudumanikuppam
Bhairavapalem	Malpe	Thekkumbhagam	Kovalam
Pathapadu	Hejmadi	Neendakara	Thuruvalkulam
Perupalem	Mulki	Poovar	Thirespuram
Vadarevu	Boloor		Punnakayal
Pallepalem	Mangalore		
Mypadu	Bengar		
Krishnapatnam			

Resource Base and General Features of the Fisheries Sector

The information on resource base and other general features pertaining to fisheries sector for the four southern states of Andhra Pradesh, Karnataka, Tamil Nadu and Kerala is given in Table 2. Altogether there are 93 districts in these states in which 34 are coastal districts. Tamil Nadu tops the list with 13 coastal districts, Andhra Pradesh and Kerala have 9 each coastal districts and Karnataka has 3 coastal districts. Altogether there are about 1465 fish landing centres and equal number of villages in these states with a coastline of 2864 kms. Andhra Pradesh owns the credit of having the highest number of (508) fish landing centres, including the inland fish landing centres, among the selected maritime states. Tamil Nadu (422) and Kerala (333) ranks second and third respectively. The continental shelf area extends to about 1,37,000 sq.km ranging from 25,000 sq.km for Karnataka to 41,000 sq.km to Andhra Pradesh. The extent of area available in the form of rivers is 31,026km, reservoir 5.63 lakh ha, ponds 16.52 lakh ha and brackish water area of 3.71 lakhs ha offering unique scope for the development of aquaculture.

The total fisher population of all the four maritime states is 2.46 million. Out of this, the percentage of fisher population in Kerala is 42.50;Tamil Nadu and Andhra Pradesh have 27.60 and 21.80 per cents respectively. Within the four maritime states, Karnataka has the least concentration of fisher population of 8.10 per cent. The fisherwomen population in the states together is 1.21 million and the average sex ratio is 967. The sex ratio is more favourable to women in Kerala (993) and favours them least in Andhra Pradesh (940). The overall literacy rate of fisherfolk is about 54 per cent ranging from 44 per cent in Andhra Pradesh to 67 per cent in Tamil Nadu. Though the overall literacy rate of Kerala is 91 per cent, with 88 per cent among women, the literacy rate among fisherfolk is 57 per cent, indicating their alienation from the mainstream of development.

Altogether fish eaters in these States comes about 47 per cent of the total population ranging from 27 per cent in Tamil Nadu to 85 per cent in Kerala. Though the position of Tamil Nadu in terms of number of coastal districts and possession of coast line including the number of landing centres, is envious, the number of fish eaters in the state is minimal, obviously displaying the vast potential of fish trading especially to other states.

Table 2. Fisheries sector in the selected maritime states.

Item	Andhra Pradesh	Karnataka	Kerala	Tamil Nadu	Total
No. of Districts	23	27	14	29	93
No. of coastal Districts	9	3	9	13	34
No. of fish landing centres	508	202	333	422	1465
Length of coastal line in Km	974	300	590	1000	2864
Continental shelf area 000,sq.Km	31	25	40	41	137
Total length of Rivers in Km	11514	9000	3092	7420	31026
Area of Reservoirs in lakh Ha	2.34	2.2	0.3	0.52	5.36
Brackish water area in lakh Ha	0.64	0.08	2.43	0.56	3.71
Area of ponds in lakh Ha	5.17	4.14	0.3	6.91	16.52
Total fisher population	536908	199577	1047039	679711	2463235
Fisherwomen population	260180	97544	521741	331399	1210864
Sex ratio	940	956	993	951	967

Literacy rate (%)	44	47	57	67	54
Percent of fish eaters	65	60	85	27	59

Socio-Economic Profile of Fisherwomen

Full time involvement of women in the primary sector of captures fisheries is negligible, rather it is more of a seasonal nature in certain activities in marine, brackish and fresh water segments. In marine fisheries women are involved only in seaweed collection, collection of bivalves and seeds with seasonal and regional peculiarities. Fisherwomen along the Ramanathapuram Coast are involved in the collection of agar yielding red sea weeds (Surtida, 1998). It is reported that about 70 % of the workers employed in seaweed collection and processing in India are women (Kaladharan and Kalia Perumal, 1999). Women are also actively involved in the collection of bivalves and their marketing to ornament dealers and lime collectors (Shaleesha, 1997). In capture fisheries, brackish water sector also, the involvement of women is observed to be passive except their engagement in the collection of clam, fish and shrimps. It is more or less remains as an involvement for basic subsistence. Fresh water fisheries provides larger opportunities to women as they engage mainly in fishing using scoop nets, traps and fish vessels in addition to the hand picking methods, almost throughout the year.

Culture fisheries is a widely growing area providing huge labour-days to the fisherfolk. In the two major types of aquaculture systems such as pump-fed and tide-fed, women have enough places to perform their roles. Women are increasingly independent and devoid men's involvement in the collection of wild seeds, segregation and stocking, construction and maintenance of ponds, feeding and harvesting in Kerala (Purushan, 1995). In view of the expansion of diversified aquaculture practices utilizing more of the potential water bodies, women can be largely absorbed into the sector. In the East Godavari District of Andhra Pradesh, women get employment in shrimp farms for 4 to 5 months in a year for activities like pond construction, seed collection and segregation, de-weeding of pond and hand picking of shrimp during harvest. Similarly women constitute about 40 per cent of the labour force involved in shrimp farm activities in Tamil Nadu (Gopalakrishnan, 1996). Some of the small-scale coastal aquaculture technologies tested and proved as economically viable and could be adopted in a commercial scale are Backyard hatchery technology for seed production of white shrimp *Penaeus indicus,* Scientific shrimp culture practices, Mud crab culture and fattening technology, Seed production technology of pearl spot, Different finfish culture practices, Polyculture of seabass *Lates calcarifer* and *Tilapia,* Mussel culture technology, Pearl culture technology, Edible oyster culture technology, Ornamental fish culture practices and Carp culture practices.

Post-harvest fisheries sector could provide maximum employment to women. The involvement of women in various post harvest activities with a broad indicative picture of nature, employment pattern and wage structure is given in Table-3. Information from the study villages show that, the common occupation in which women engaged are beach work, small-scale fish trading, fish curing / drying / net making, peeling and processing plant work. The occupational status of women in various fisheries related activities are given in Table-4. Altogether about 2.5 lakh women are involved in different activities. Out of this, a total number of 72043 (28 per cent) women are engaged in small-scale fish trading. Fish curers/dryers/net makers constitute 21 per cent of the total women work force. The second largest category of occupation is that of peeling work (19 per cent) followed by processing plant work (17 per cent) (Figure-1). Peeling work as well as processing plant work are mostly institution- based and more likely to be in the formal sector of employment. Hence entry into such jobs are comparatively more restrictive than other

engagements. It could be presumed that the increase in the production figures of fisheries sector would have its immediate accelerator effect upon the informal employment sector (non-institution based), such as beach work, fish trading, fish curing/drying/net making. As far as Kerala is concerned, peeling work dominates the occupational scene with 45 per cent of the total women work force. Tamil Nadu has a significantly different occupational pattern, in which 51 per cent of the women work force engage in fish trading, and 32 per cent in fish curing/drying/net making. The state is yet to make its fisheries ventures more formal and the potential of institution-based fish processing for women is comparatively high in Tamil Nadu. Karnataka also displays a similar picture, as 44 per cent and 34 per cent of its fisherwomen are engaged in beach work and small-scale fish trading respectively. Andhra Pradesh employs 32 per cent of its fisherwomen in fish curing/drying/net making and 27 per cent in processing plant works.

Table 3. Nature and pattern of post harvest engagement of women in fisheries.

Sl. No	Occupation	Place / type / nature	Employment and wages
1	Sorting and Grading	1. All major mechanised centres 2. Throughout the year but intense work during peak seasons 3. Flexible working hours	1. Mostly contract employment. 2.Monthly earnings ranges from Rs. 300/- to Rs. 3500/-
2	Curing and Drying	1. All fish landing centres 2. Highly seasonal 3. Market surplus is mostly used for curing and drying	1.Self employed/ Contract 2.Monthly income varies from nil to Rs. 1500/-
3	Peeling work	1. Major trawl/export centres 2. Throughout the year 3. Working hours flexible as per seasonality	1.Mostly contract labours/daily workers 2.Monthly earnings varies from Rs. 300/- to Rs. 2000/-
4	Processing plant work	1. Export companies 2. Freezing/grading and packing/ Quality assurance 3. Fixed work hours throughout the season	1.Regular employment 2.Monthly salary ranges from Rs. 1500/- to Rs. 3,000/-
5	Fish meal work	1. All major centres 2. Throughout the year but intense during peak seasons 3. Utilization of fish waste and surplus	1.Self employment/ contract labourers 2.Monthly wages ranges from Rs. 500/- to Rs.3000/-
6	Fish trading	1. All landing centres/marketing centres 2. Throughout the year 3. Perform all roles from that of auctioneers to retail vendors. 4. Long working hours	1.Self employment 2.Average monthly income ranges from Rs. 500/- to Rs. 3000/-
7	Value addition	1. All major centres 2. Fish varieties used will depend on availability 3. Catering both domestic and	1.Mostly as competitive venture 2.Good opportunity for self help groups 3. Monthly earnings ranges from

		international demand	Rs. 750/- to Rs. 2000/-

Table 4. Occupational Status of Fisherwomen.

Occupation Item	No. Of fisherwomen				Total
	Andhra Pradesh	Karnataka	Kerala	Tamil Nadu	
Beach workers	8742 (9%)	15000 (44%)	5612 (6%)	2589 (8%)	31943 (12%)
Small scale fish traders	23033 (24%)	12000 (34%)	20220 (23%)	16790 (51%)	72043 (28%)
Fish curers and dryers / net makers	31775 (32%)	3000 (9%)	6504 (7%)	10823 (32%)	52102 (21%)
Peeling workers	6442 (6%)	2000 (6%)	39397 (45%)	478 (1%)	48317 (19%)
Processing plant workers	25977 (27%)	900 (3%)	14028 (16%)	1172 (4%)	42077 (17%)
Others	1800 (2%)	1500 (4%)	2000 (3%)	1260 (4%)	6560 (3%)
Total	97769 (100%)	34400 (100%)	87761 (100%)	33112 (100%)	253042 (100%)

Note 1: Figures in parenthesis are percentages
2: Variations in Occupational status of fisherwomen are different between states ($p<0.001$)

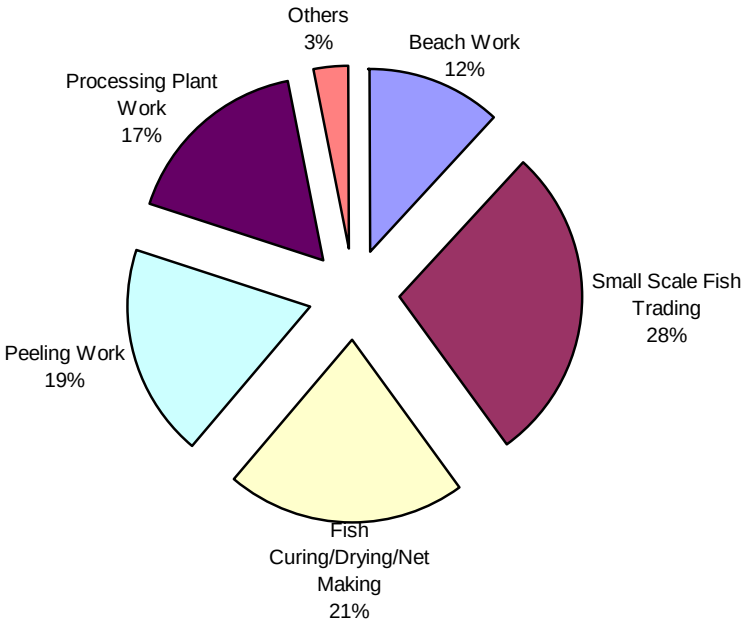

Figure 1: Occupational Pattern of Fisherwomen (Average)

Income levels of Women engaged in fish processing activities

The fishing community is mostly dependent on the fishery resources for livelihood and the roles that fisherwomen play in this respect are of great importance for the maintenance of the family (Srinath, K, 1987). Table-5 shows the income level of women in different processing activities and the average number of hours spent by them in different post harvest activities. Although value addition provides the highest earnings per hour, fish vending offers the best opportunity to earn higher annual income, in terms of the average annual working hours provided. Shrimp peeling is a seasonal activity depending on prawn fishery season, the peak period being June-September. Shrimp peeling is mostly carried out either in peeling sheds, houses rented/owned by agents or in homesteads of workers. Usually, in a peeling shed, women are employed depending on the quantity of prawns they peel in a day. On an average, a woman gets Rs.50 to 60 per day during the peak season. The average annual income of a prawn peeler is Rs.9720, which varies from Rs.500 for occasional part time worker to Rs.20000 for a full-time worker.

Table 5. Average working hours and earnings of women in different sectors.

Activity	**Average Annual working hours**	**Average Income per hour (Rs)**	**Average Annual income (Rs)**
Peeling	1620 (4)	6.00 (4)	9720 (5)
Curing	1944 (3)	12.00 (3)	23328 (3)
Drying	729 (6)	4.40 (5)	32076 (2)
Sorting	1960 (2)	4.20 (6)	8232 (6)
Vending	3600 (1)	16.60 (2)	59760 (1)
Value Addition	900 (5)	20.00 (1)	18000 (4)

Note: Figures in parenthesis are the ranks based on the relative position of activity

As soon as the catch is landed, mostly women are engaged for the post harvest operations including curing and drying. The average number of hours spent by a woman labourer in a year in curing work is 1944 and for sorting, the hours spent in a year is 1960. Sorting is done for separating different varieties of fishes into separate lots. There are three grades of sorting based on the uniformity in size and a quality identified in first, second and third grades. The procured fishes are sorted out and trash fishes are taken to fishmeal plants. The exportable varieties are graded, cleaned, packed in ice and sent to processing centres. It is found that the average income obtained per hour from sorting is Rs.4.20. It is also observed that the women sorters sell some edible prawns and small fishes discarded from the lot. This earning either becomes an additional source of income or if not sold, the fish is used for household consumption. On an average, 729 hours a year is spent for drying activities. In fish drying, women labourers working on contract basis earn Rs.100 for each lot. They require about 3 days of time for drying each lot. The time spent on fish drying ranged from 8 to 12 hours a day. In general, fish worth Rs.6000 - 7000 is bought for house-based drying.

Women fish vendors operate as an important link between producers and final consumers. They purchase fish either from the fishermen at landing centres through auction or from traders through bargaining. Fish vendors mostly undertake the distribution of fishes at the retail market. Female vendors carry baskets of fish as head loads where as male vendors use cycles to carry fish for marketing. These fisherwomen borrow Rs.500 to Rs.2000 daily from middlemen to buy fish. After selling fish they return the money to the lenders with interest. They buy ice worth Rs.40 to Rs.75. No wastage of fish is recorded as the fisherwomen take the fish remaining either for household consumption or for drying. The average income per day for their labour comes about Rs.200 to 300 per day and this works out to an average annual income of Rs.59760 (Table-5).

Age-wise distribution of women engaged in different post harvest activities is given in Table-6. Majority of the women involved in activities like peeling, curing and value addition work belong to 20-40 years age group and those in activities like sorting, drying, marketing (fish vendors), majority are between 40-60 age group. In the case of drying and sorting, 5 per cent of fisher women are above 60 years in age. Activities like drying and sorting entail comparatively less physical strain and this might be the reason for the involvement of age-old women in it. Maximum number (80 per cent) of women are engaged in value addition works, this being skill oriented and only youngsters and middle aged women opt for this work. Young and unmarried girls are usually not allowed to go for vending purpose, and the few in this activity take up the job due to poverty and unemployment. Accordingly, 70 per cent of fish vendors belonged to 40-60 years age group and only 30 per cent belonged to 20-40 years age group.

Table 6. Age wise distribution of women by activity (%)

Age Group (years)	ACTIVITY					
	Peeling	Curing	Drying	Sorting	Value Addition	Fish Vendors
<20	8	-	-	-	5	-
20-40	57	75	40	25	80	30
40-60	30	25	55	70	10	70
>60	5	-	5	5	5	-
Total	100	100	100	100	100	100

Constraints in the Development of Fisherwomen

1. Limited access to resources
2. Lack of access to leadership positions and voice in decision making
3. Inadequate training and formal education
4. High disparity in ownership of productive assets and wage structure
5. Exploitation by middlemen and contractors
6. Intensive labour and long working hours
7. Lack of interest in occupations other than fisheries
8. Lack of credit facilities
9. Socio economic framework with traditional customs and conventions
10. Inadequate health care for occupational hazards
11. Lack of knowledge in latest technologies of aquaculture and post harvest management.

Conclusion and Policy Suggestions

Location-specific and need based training programmes for fisherwomen should be organised to enhance the awareness and technical know-how enabling them to start self-generating gainful employment ventures in aquaculture and post harvest sector of fisheries. Involvement of women in all types of aquaculture practices should be encouraged. There is enormous scope to adopt and expand ornamental fish culture to earn a very high income both in rural and urban centres. The global trade of ornamental fish is estimated to be of US $4 billion per annum, in which India's share is only US $0.1 million (Shaleesha and Stanley, 2002). Though the picture is bleak in the international milieu, India is bestowed with its vast indigenous stock of germplasm and the unemployed or underemployed manpower. Women could significantly contribute to this sector if trained and oriented in the right direction.

Similarly, in view of the possibilities of income and employment generation in the rural areas, pearl culture could be suggested as an alternative and lucrative micro-venture, especially to women, both in the marine and freshwater segments. The world production of pearl is estimated at about 300 tonnes and 2/3rd of freshwater pearl trade is dominated by China and Japan. India imports pearls to the tune of Rs.100 crores in a year (Narasimham 2001). Although indigenously developed technologies for marine and freshwater pearl culture are available, few commercial ventures have come up. Freshwater pearl culture is fast picking up and there are moves to integrate it with the carp culture to generate additional revenue to the farmer. Women could take up pearl culture as a productive income-earning venture on account of the vast unutilised potential.

Yet another opportunity in aquaculture is the extensive adoption of Mussel culture by Self Help Groups (SHGs) of women. CMFRI has developed a technology for the farming of mussels in the open sea and protected bays. The technology is simple and cost effective and has been widely adopted by the fisherfolk of Kerala and Karnataka (Pillai, 2000). Several women SHGs in the Kasaragod district of Northern Kerala have successfully tailored the venture and proved profitable.

More emphasis should be given for the involvement of women in the preparation of value added products. Promotion of diversified value added products not only accelerate earnings in exports, but also provide a multiplier effect on employment front especially for weaker sections and women folk. An additional export of almost 1-lakh tonnes of value added products in our marine products could easily corner about Rs.1500 crores of export earnings and generate regular

employment opportunity to about 35,000 fisherfolk. Efforts taken by government and non-governmental agencies to organise fisherwomen into self help groups and involving them in the preparation of value added products and marketing has brought out encouraging results.

House-based ventures are more preferred by women and finds suitable to their present social fabric. Aqua-feed making using the indigenous resources as a cottage industry may be developed to suit the needs of the aquaculture industry. Women in various site of Kerala such as Tamil Nadu has come up with successful enterprises. Apart from this, development of backyard hatcheries to cope with the local demand patterns of quality seeds of fish / shrimps could be taken up. Appropriate training programmes, including the possible linkages of necessary credit facilities in liaison with scientific institutes and formal financial institutions respectively should be imparted to the primary stakeholders. It is better to promote "men and women partnership firms" instead of exclusively women-oriented enterprises. It is seen that husband-wife enterprises with one or two helpers in fish processing / marketing and other fishery related activity yields better prospects.

Acknowledgements

Dr. (Mrs.) Vijaya Khader, Dean, Faculty of Home Science & Principal Investigator acknowledge the financial support extended by the World Bank through the National Agricultural Technological Project (NATP) and Indian Council of Agricultural Research (ICAR) to carry out this study in Coastal Eco-system of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Further the authors expressed their sincere gratitude to Dr. N. S Sudharara, Mangalore; Dr. H. Mohammed Kasim, Chennai; Dr. R. Narayana Kumar, Kakinada; Dr. J. Lakshmi, Bapatla and Mr. K. Dhanapal, Muthkur.

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