Mapping of marketing channels and price ranges of commercially important finfish species in the coastal districts of West Bengal, India

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Original Article

Abstract

This study was conducted to map the marketing channels and price ranges of some commercially important marine finfish species in two coastal districts of West Bengal. Nine commercially important marine finfish species were investigated. Different nodes were found to be involved in the marketing channel depending on the commercial value of the species, and a large gap was observed between the price in the retail market and the price received by the primary fisher. A large number of stakeholders are involved and find employment in the fish marketing chain as fishers, assemblers, processors, traders, wholesalers, retailers, transporters and loading and unloading workers. The price range of Bombay duck (*Harpadon nephereus*) was Rs. 25-50/kg at the auction centre level to Rs. 300-500/kg at the level of retailers in distant markets. For Silver pomfret (*Pampus griseus*), the price range had large fluctuations with Rs. 150-1000/kg at the auction centre level itself. When the commodity reaches the retailers in the distant markets, the price range was Rs. 350 to 1300/kg. The marketing chain for the flow of Orange-spotted grouper (*Epinephelus coioides*) was narrow with the nodes such as commission agents, assemblers, wholesalers and retailers, who play a major role in distributing the landings from the auction centre to domestic consumers. Processing and export nodes were not to be found. The price range was Rs. 200-300/kg at the auction centre level to Rs. 400-500/kg at the retailer level in distant markets. The investigation exposed the range of actors required to bring the product from the landing centre through the different phases of distribution and delivery to final consumers. The value chain approach will be useful for the key actors such as fishers, managers and policymakers to streamline their operations cost-effectively, for increased earnings of the value chain actors and notable impacts on credit repayment.

Keywords: Marketing channels, value chain analysis, finfish, mapping

Introduction

The contribution of marine fisheries to the economy is significant through its huge employment generation in primary, secondary and tertiary sectors, foreign exchange earnings and food security needs. Improved storage and preservation techniques coupled with developments in transport and processing infrastructure brought out dramatic changes in the fish trade scenario in the country. Efficient supply chain strategies are essential for protecting the interests of fishermen, traders and consumers in the context of diminishing catch rates and increasing prices. Fresh marine fish now reach faraway places from the seashore. Immediately after landing, it travels very fast and within hours, reaches distant places and far away demand centres indicating immense changes that have taken place in the transport sector and the efficiency of the marketing system. Product diversification and value addition further promoted assured prices to the producers in the fisheries sector (Sathiadas *et al.,* 2012). Aswathy *et al.* (2014) discussed the structure of marine fish marketing in the state of Kerala as well as the efficiency of different marketing channels. The analysis revealed that the

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35

marketing efficiency was high for commercial species like seer fishes and intermediaries were grabbing a significant share of the consumer's rupee. West Bengal with a coastline of 158 km, two coastal districts, 171 marine fishing villages, 49 marine fish landing centres, 3.7 lakh fisherfolk population (CMFRI Census, 2016) has contributed 1.9 lakh t of marine fish landings during 2022 registering an increase of 38% compared to 2021 (CMFRI, 2023). The marine landings during the period were dominated by pelagic resources with landings of 0.912 lakh t (48%) followed by demersal (58,300 t, 31%), crustacean resources (32,300 t, 11%) and molluscan resources (7,600 t, 4%). This study sought to broadly understand the marketing systems of selected finfish resource landings along the two coastal districts of West Bengal *viz.,* East Medinipur and South 24 Parganas.

Material and methods

The study was conducted from 15 markets in the two coastal districts of West Bengal *viz.,* South 24 Parganas and East Medinipur (Fig. 1). These two coastal districts respectively contributed 51% and 49% of the total marine fish landings (Roul *et al.,* 2022). The marine fish marketing nodes were studied by the various actors along the marketing channels from January to December 2022. The study covered 15 fish markets, which include seven wholesale cum retail, six retail and two terminal fish markets. The data collected were the different nodes and intermediaries involved in the marketing system and selected marine finfish prices at various marketing channels. The analysis was conducted by mapping the product flow, where the purpose of mapping was to determine the flow of products and the price range in the supply chain. The mapping was carried out starting from the landing centre and continued till the consumer.
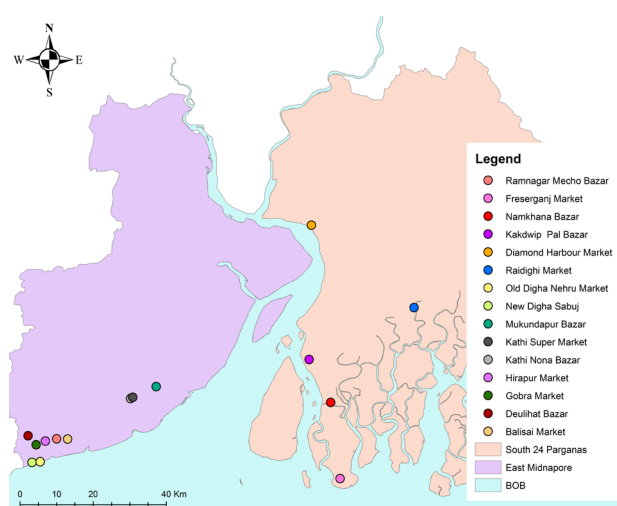

Fig. 1. Location of the fish markets covered under the study

The study gathered information through a simple random sampling survey among fishermen, assemblers, wholesalers, fish traders, middlemen and fish retailers. The total sample size of the study was 120 which comprised mainly 45 fishermen, *beparis* and depot owners, 40 middlemen and marketing agents, and 35 retailers. The primary data were collected using a personal interview method with semi-structured questionnaires. Combinations of participatory, qualitative and quantitative methods were used for data collection. The interviews focused on channels of marine fish distribution, price range and marketing constraints. Before this study, stakeholder meetings and field visits were also made to fish landing centres, wholesale markets, fish salting and dry fish yards in Digha Mohana and Sankarpur. During the field visits, interaction was held with the fishers to get first-hand information on the parameters such as the socio-economic characteristics, marketing and value chain along the coast of West Bengal. Around 35-40 marine finfish species were marketed in these 15 selected markets (Fig. 1). The most common finfish species/ groups traded were anchovies, croakers, Bombay duck, pomfrets and Hilsa. Price discrimination exists for the different fish species (Roul *et al.,* 2022).

Results and discussion

A large number of stakeholders are involved and find employment in the fish marketing chain as fishermen, assemblers, processors, traders, wholesalers, retailers, transporters and loading and unloading workers. The market chain from fishermen to consumers encompasses mainly primary, secondary and retail markets, involving various actors. Fishermen are the primary producers in the fish marketing chain. In a study on market structure analysis of coastal West Bengal, Roul *et al.* (2022) reported that the marine fish marketing operations were performed by a large number of intermediaries who were well organized with good networks on fish trade and other facilitating functions. The fish market channels were in operation with the wholesalers buying fish in bulk quantities from auctioneers or regional suppliers and selling it to retailers or other traders. The wholesalers imparted value addition in terms of sorting, grading, cleaning, icing and packing fish before sale. Subsequently, the retailers sold the fish directly to consumers over the counters or with the help of vendors. Retailers mostly buy fish from the wholesaler, but in several cases, groups of retailers were found participating in the auction process for buying fish directly from the auctioneers. The sources of finance for various operations along the value chain are from private sector, cooperative societies, fishermen associations, and institutional finance. Some of the commercially important finfish species traded in the surveyed 15 markets are given in Fig. 2.

Fig. 2. Landings of commercially important finfish species. A) *Trichiurus lepturus*, B) *Pampus griseus*, C) *Scomberomorus guttatus*
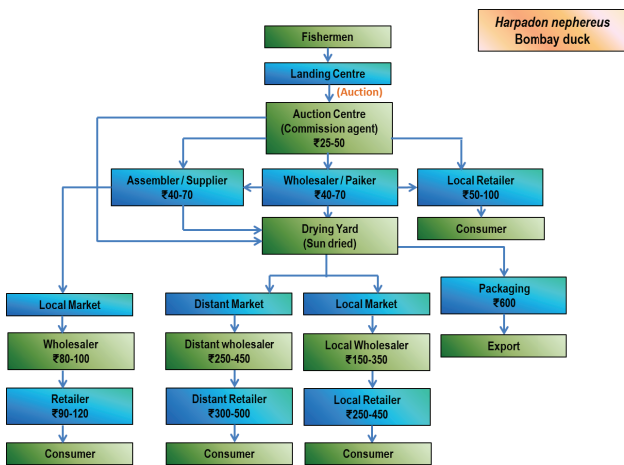

Fig. 3. Market chain map of Bombay duck in the areas surveyed

There are two main fishing seasons for finfish, the peak and the lean season. Apart from the ban period, which is fixed, the concepts of 'lean' and 'peak' are subjective. On average, the peak season lasts for about six months from August to January and the lean season for about six months from Feb to July, including the monsoon fishing ban period. The price changes which happen across the channels are depicted in Fig. 3 to 11 for the selected resources of finfish.

Market chain mapping

H. nephereus: Once the landings from different landing centres reach the Digha Mohana auction centre, five marketing chains were found to be prominent in the *H. nephereus* marketing chain such as assemblers/ regional suppliers, wholesalers, retailers, drying yards and export units. In the marketing chain, the dried products reach the export market from the fishermen through the channels *viz.,* landing centre, auction

centre, regional suppliers, drying yards and packaging units. The commodity reaches domestic consumers through local and distant markets via wholesalers and retailers. The price range of *H. nephereus* was Rs. 25-50/kg at the auction centre level to Rs. 300-500/kg at the level of retailers in distant markets. The price of dried products was Rs. 600/kg at the node of packing units (Fig. 3).

Trichiurus lepturus: The predominant channels for distributing the commodity *T. lepturus* were almost similar to *H. nephereus*. Assemblers/ regional suppliers and wholesalers were found to be the predominant channel for distributing the commodity to distant domestic markets such as Chennai, Mumbai and Kolkata, both in fresh and dried form. The dried commodities reach the export markets through packaging units. The price range was found to be Rs. 50-120/kg at the auction centre level to Rs. 200-400/kg at the level of distant retailers (Fig. 4).

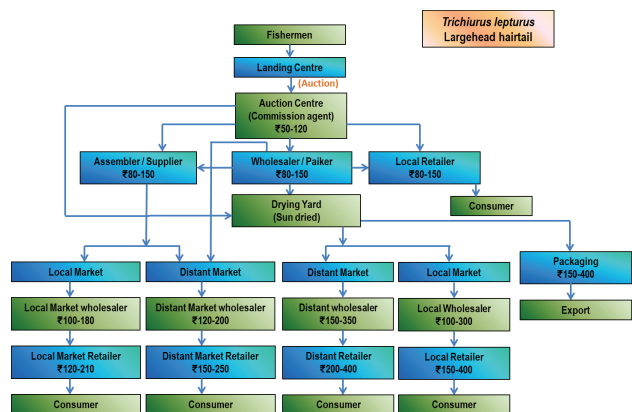*Pampus griseus*: The marketing chain for *P. griseus* is given

Fig. 4. Market chain map of Largehead hairtail in the areas surveyed
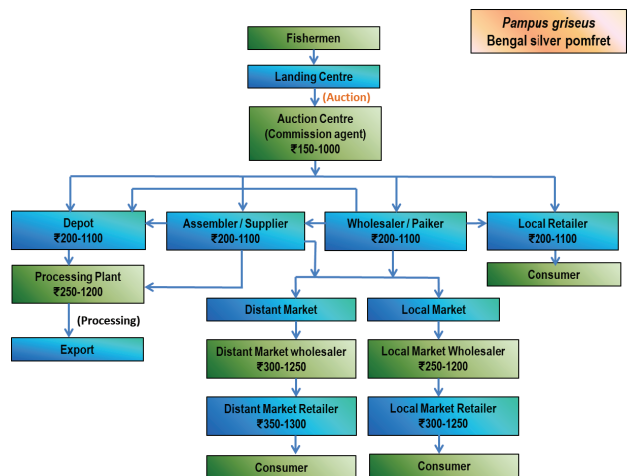

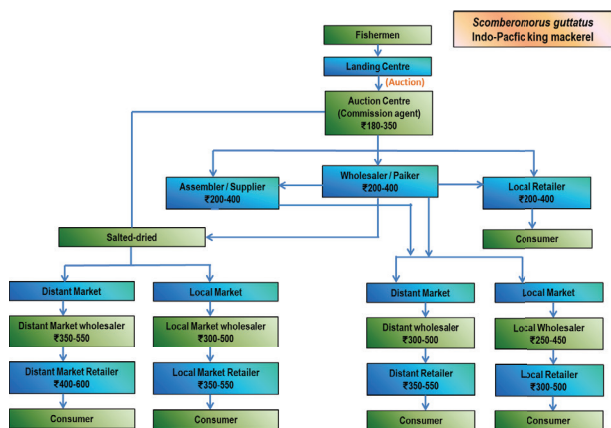Fig. 5. Market chain map of Bengal silver pomfret in the areas surveyed

Fig. 6. Market chain map Indo-Pacific king mackerel in the areas surveyed
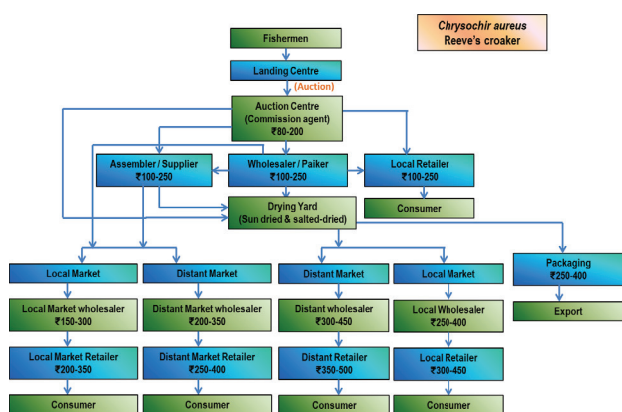

Fig. 7. Market chain map of Reeve's croaker in the areas surveyed

in Fig. 5. The distant domestic market for this commodity was found to be the Mumbai, Chennai and Bangalore markets, for which the regional suppliers and wholesalers play a major role in its distribution. The export market channel was depots and processing plants. The price range was found with huge fluctuations with Rs. 150 -1000 per kg at the auction centre level itself. When the commodity reached the retailers in the distant markets, the price range was from Rs. 350 to Rs. 1300/ kg. Ahsan *et al.* (2016) reported that four marketing chains were found for pomfret fish marketing. In marketing chain I, pomfret fish reached the export market from fishermen through a landing centre, depot and processing plant. In marketing chain II, pomfret fish were dried and then supplied to the local market, distant market and export market and ultimately reached consumers. In marketing chain III, pomfret fish reached distant consumers from fishermen through landing centres, distant *paiker,* distant wholesalers and distant retailers. In marketing chain IV, pomfret fish reached consumers from fishermen through local wholesalers and local retailers. Aswathy *et al.* (2014) in a study in Kerala reported that a comparative analysis of marketing efficiency in different

channels showed that the intermediaries received the highest margins per kg of pomfrets (Rs. 53 to Rs. 84 per kg).

Scomberomorus guttatus: The mapping of *S, guttatus* marketing chain in the areas surveyed is given in Fig. 6. The price range was found to be Rs. 180-350 per kg at the auction centre level to Rs. 400-600 per kg at the level of distant retailers. Commission agents, assemblers, wholesalers and retailers are found to play a major role in distributing these landings from auction centres to domestic consumers and export units.

Chrysochir aureus: Once the landings from different landing centres reach the Digha Mohana auction centre, five marketing chains were found to be prominent in the Reeve's croaker marketing chain such as assemblers/ regional suppliers, wholesalers, retailers, drying yards, packaging units and export market. In the marketing chain, the dried products such as sun-dried and salted dried reach the export market from the fishermen through the channels *viz.,* landing centre, auction centre, regional suppliers, wholesalers, drying yards and packaging units. The commodity reaches domestic consumers through local and distant markets via wholesalers and retailers. The price range was found to be Rs. 80-200/kg at the auction centre level to Rs. 350-500/kg at the level of retailers in distant markets. The price of dried products was found to be Rs. 250-400/kg at the node of packing units (Fig. 7).

Coilia dussmieri: Commission agents, wholesalers, retailers, drying yards and packaging units were found to play a major role in distributing these landings from the auction centre to domestic consumers and export units. The major export market was found to be Bangladesh, for this resource from West Bengal. The price range was found to be Rs. 35-50/kg at the auction centre level to Rs. 250-350/kg at the level of retailers in distant domestic markets (Fig. 8).

Rastrelliger kanagurta: The predominant nodes in the marketing system and the price range for *R. kanagurta* were found to be almost similar to *C. dussumieri*. The commodity reaches domestic consumers through local and distant markets via wholesalers and retailers (Fig. 9). The price range of Indian mackerel was found to be Rs. 60-100/kg at the auction centre level to Rs. 300-350/kg at the level of retailers in distant markets. The price of dried products was found to be Rs. 200-300/kg at the node of packing units through which it goes to the export market.

Scoliodon laticaudus: Commission agents, assemblers, wholesalers and retailers are the predominant marketing channels found to play a major role in distributing the landings from auction centres to consumers (Fig. 10). The export market
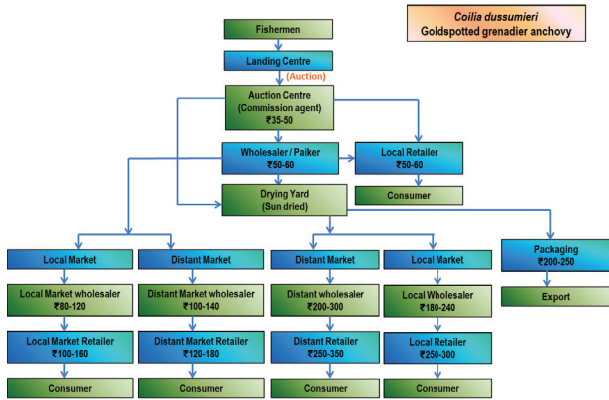
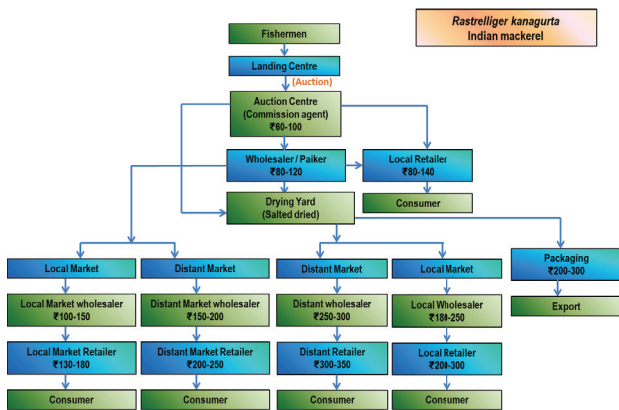Fig. 8. Market chain map of Gold spotted grenadier anchovy in the areas surveyed

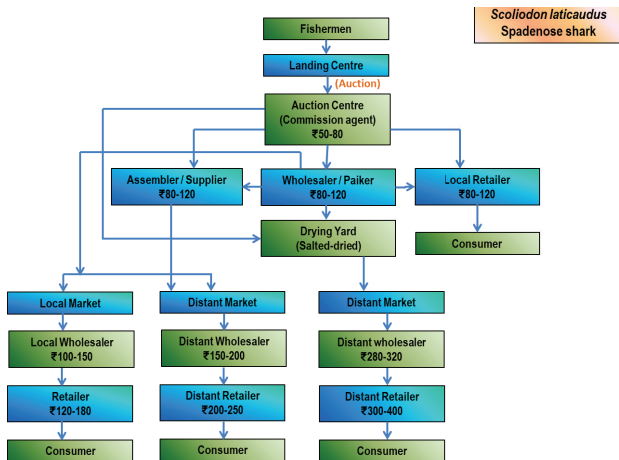Fig. 9. Market chain map of Indian mackerel in the areas surveyed

Fig. 10. Market chain map of Spadenose shark in the areas surveyed
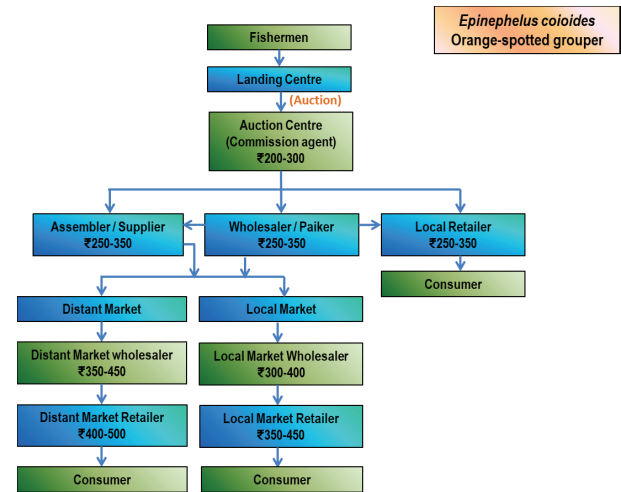
Fig. 11. Market chain map of Orange-spotted grouper in the areas surveyed

Epinephelus coioides: The marketing chain for Orange-spotted grouper was simple with the nodes such as commission agents, assemblers, wholesalers and retailers, who are found to play a major role in distributing the landings from the auction centre to domestic consumers. Processing and export nodes were not to be found. The price range was found to be Rs. 200-300/kg at the auction centre level to Rs. 400-500/kg at the level of retailers in distant markets (Fig. 11). In similar studies, Khalil (1999) noted that the main marketing channel of marine fishes in Cox's Bazar and Chittagong districts of Bangladesh are fishermen-*beparies-aratdars*-retailers-consumers. Munir *et al.* (2006) noted that generally the supply chain of marine dried fish was comprised of several stakeholders like producers, wholesalers, *aratdars*, middlemen, retailers and finally at the top, the consumers. Alam *et al.* (2012) observed that the supply chain of fish comprises six intermediaries namely farmer, *aratdar, paiker,* trader, retailer and consumer for the distant domestic market. The results from the present study were more or less similar to previous studies. The market price of the marine finfish species seemed to be increasing step by step and was at the highest level when they reached the consumer. Aswathy *et al.* (2014) reported that the main marketing channels in Kerala comprise local marketing channels and interstate channels. In the wholesale markets in Ernakulam, fish reach from other states like Tamil Nadu, Karnataka, Andhra Pradesh, Goa, Maharashtra and Odisha in addition to the various landing centres in the state. Rameswaram, Tuticorin and Kanyakumari are the major centres in Tamil Nadu from where fish reach the wholesale markets in Kerala and move to the southern districts of Thiruvananthapuram, Kollam, Alappuzha and central districts like Ernakulam, Idukki and Kottayam. Fish from Karnataka reach Kozhikode, Kannur, Palakkad, Shornore, Ernakulam and Alappuzha districts. Oil sardines, mackerels,

was not to be found for this resource from West Bengal and its distribution was found to be only in domestic markets. The price range was found to be Rs. 50-80/kg at the auction centre level to Rs. 200-250/kg at the level of retailers in the distant markets. The price range for the salted and dried product was found to be Rs. 300-400/kg at the level of retailers in the distant domestic markets.

flatfishes and crabs were mainly coming from Karnataka. In addition, fish were also coming from Vijayawada in Andhra Pradesh, Ratnagiri in Maharashtra and Odisha by trains in insulated thermocol boxes. The absence of institutional finance available to the fishermen, the risks involved in handling the perishable commodity and the huge amount of money required for immediate payments after disposal made the system under the control of the cartels formed by the traders (Aswathy *et al.,* 2014).

During the stakeholder interfaces, it was reported that the immediate needs are cold chain and storage facilities, insulated vehicles and hygienic markets. At the primary market level, the major constraint expressed by the fishermen was a lack of bargaining power and inadequate market information. The major sources of finance for various operations along the value chain are from private money lenders, hence improved access to institutional finance was also a perceived need. The problem related to distribution to export markets is long-distance transportation, wherein the vehicles are often charged at several checkpoints during the transportation.

Conclusion

The market chain analysis exposed the range of actors required to bring the product from the landing centre through the different phases of distribution and delivery to final consumers. The marketing operations were performed by a large number of intermediaries who were well organized with good network on fish trade and other facilitating functions. The wholesalers imparted value addition in terms of sorting, grading, cleaning, icing and packing fish before they were sold to retailers or vendors. The price depends on quality, size and weight, season, market structure, supply and demand, *etc*. The marketing channels for different finfish species were different from each other. The analysis will be useful for the key actors such as fishers, managers and policymakers to streamline their operations cost-effectively for increased earnings of the market chain actors and notable impacts on credit repayment.

Acknowledgements

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