

('good' and 'bad' names, etc.), and reports on naming practices, baptism, etc. In total, some 2,000 names were reported and/or commented upon.

5. All cited boat names in *italic* style. Translations of Norwegian appellative names are rendered in square brackets [].

6. I.e. not for the respondents' own boats, but the boat names reported and/or commented upon by the respondents.

7. Also, young boat owners will probably oppose the elder generation through such names, but the material is so small to allow a further discussion of this topic.

8. The VHF radio catalogue (1988) lists 14, but there are probably several other *Bajas* without radio communication equipment.

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A Capitalist Fisheries Co-operative: A Bulgarian Innovation

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ABSTRACT Eastern Europe is now experiencing turbulent times. Old institutions are being dismantled, a pluralist political system is appearing, market mechanisms are introduced to replace centralist 'command' economies, and state firms are privatized. The future of the co-operative sector is now a political issue in several Eastern European countries. Does privatization mean the liquidation of co-ops or simply a more favourable environment for exercising co-op management? In this paper we view the new situation from the perspective of one Bulgarian fisheries co-operative. We describe how the co-op is coping with the old regime. We also detail its hopes and aspirations for the future.

Introduction¹

Privatization is now, more or less, under way in most Eastern European countries. The central state is loosening its grip on the economy. Prices are left to market forces. State enterprises are sold, the family farm is reintroduced, and confiscated land is given back to the original owners.

Many Western observers have noted that there is a tendency to go from one extreme to the other. At present, the market mechanism is seen as a panacea for most, if not all, problems of the economy. Collective institutions have been so discredited under communist rule, that they have lost all legitimacy.

If this is, in fact, the case, one wonders what is going to happen to the co-operative sector in Eastern Europe. Co-operatives were well established long before the communist take-over and have survived, to some extent, up to this day. Will the co-operatives be strengthened or transformed? Or, will they go down the drain together with the state corporate system? The role and status of the co-operative form of organization is now a matter of debate in many Eastern European countries, and the outcomes remain to be seen. In this paper we suggest that the future of co-ops in Eastern Europe depends on the answer to the question: Are co-ops by nature (mostly) public or private enterprises?

By definition, co-operatives are neither public nor private, but contain elements of both. As noted by Otnes:

They oppose capitalist firms, as co-ops are aiming for the maximization neither of profit nor of turnover. They oppose socialist enterprises, since co-ops are aiming merely for a more egalitarian distribution of profit, not for its abolition (1988:126).

Co-op property is unlike that of socialism in being shared but still private, not public; it is further unlike capitalism in being private but rejecting the remuneration of Great or Finance Capital in itself, whenever unwed to its owners' personal participation in co-operative activities (1988:128-29).

If, conceptually, the alternatives at hand are regarded as a choice between public or private, there should be no room for the co-operative under privatization. In the current situation then, co-ops in Eastern Europe find themselves in a squeeze. Their future is uncertain unless they can be classified as private or reorganized so as to fit the criteria of private enterprise.

Here, their record under the previous regime is important. For instance, to what extent are co-ops identified with the old system? Poland is an interesting case in point (cf. Jentoft and Marciniak 1991). While new co-operative legislation is now in process (January 1992), co-ops are still in operation at the local level. However, state-controlled unions of co-operatives at sectoral, regional and national levels have been abolished. In Poland privatization does not exclude co-operatives, only the 'command' structure which has surrounded them. This has led to more autonomy; but, it has also made co-ops more vulnerable, as they must now become more self-reliant and competitive. We argue that the political and popular support of co-ops in today's Poland can partly be explained by the fact that also under the old regime, and particularly during the 1980s after the rise of the Solidarity movement, co-ops were regarded as 'havens' of local initiative, participatory democracy and 'grass root' control.

This paper brings us to another Eastern European country, Bulgaria, and to a very different situation when compared to the Polish circumstances. Co-ops played a substantial role in most sectors of the Bulgarian economy, fisheries included, long before the communist government assumed power in 1945. From 1947 onwards, they met with resistance from the new government as private property became nationalized. The co-ops were not targeted directly, but new legislation made it increasingly harder to survive with the classic co-operative principles intact. In this way, Bulgarian co-operatives experienced much of the same fate as Polish co-ops. But, while Polish fisheries co-ops survived and thrived in spite of a rather hostile state bureaucracy, their Bulgarian counterparts vanished because of the many restrictions that were put on co-op activities. Thus, by 1990 there was only one Bulgarian fisheries co-operative remaining, the *Neptune Fisheries Co-operative*. In this paper we tell the story of this co-operative: how it came about, how it is organized, and how it struggles to survive in a system where much of the old bureaucratic command structure is still intact, but where privatization is taking place. These structures are viewed from the 'bottom up' as we describe how they are seen through the eyes of the members and the management.

Co-operatives in Bulgaria

According to a report published by the London-based International Co-operative Alliance (ICA 1980), Bulgarian co-ops accounted for about 33 percent of national retail goods turnover and 36 percent of the turnover in public catering. Industrial enterprises of consumer co-operatives manufactured 98 percent of non-alcoholic beverages, some 70 percent of confectioneries and 56 percent of bread and other baked goods produced in the country. Agricultural production co-ops occupied 70 percent of all cultivated

land, and were also heavily involved in agricultural raw materials processing. Co-ops could also be found in souvenir production, clothing manufacture, carpentry, and communal services. Today they form a national union of co-operatives based in Sofia, with regional subdivisions.

The first co-operatives in Bulgaria were established as early as the 1880s within commerce, finance and manufacturing industries. They were formed by people who were inspired by German experiences with this particular organizational form. The co-ops played a major role in the Bulgarian economy. They enjoyed much popular confidence and support by the end of World War II when the communist government took over.

From 1947 onwards a process of nationalization started, which gradually changed the working conditions of co-operatives. The co-ops were not targeted directly, but step by step they lost much of their autonomy, through devices such as taxation and the state monopsony with prices being decided unilaterally by the government.

In the late 1960s and early 1970s many co-operatives, particularly within agriculture, were nationalized despite, or rather because of, their relative success and competitiveness. However, they retained their name as co-operatives. This may blur the meaning of the statistics presented above. These developments have also brought many Bulgarians to regard state firms and co-ops as the same thing.

Fisheries co-operatives were also in operation long before the communist regime took over. They were all small-scale organizations operating either on the Black Sea coast or on the Danube river. Among the very first fisheries co-ops was the *Bulgaria* in the town Sozopol on the Black Sea coast. It was created in 1924 by young men who finished their training at a professional fishermen's school and needed employment. Some 80 to 150 people worked there, divided into teams of ten members – a *daljan* – each of which operated a fixed trap. The co-op was operative until 1947.

Before World War II individual *daljans*, working as informal quasi-co-operatives, spread along the whole Bulgarian coast and on the Danube. The number of people in the *daljan* varied depending on season and type of fishery, but usually it comprised 10 persons. The catch was divided into 11.5 parts, named a *pai*, which was distributed so that the captain got 2 *pais*, the vice-captain 1.5 *pai*, and one *pai* to each of the crew. One can still find a *daljan* in operation in the town of Sozopol. All members are retired fishers from the local state enterprise. They get their boats, equipment and petrol from the state firm and for this they have to pay fifty percent of their catch. The balance remaining is divided as described. This part of their catch is sold privately.

In the early 1950s the fisheries co-operative – *Trud* – was established in Sozopol, with 60 members. However, due to financial difficulties it was soon closed, and the fishers became employed by the local state company. Four other fisheries co-operatives were established during the 1950s in Sozopol, two of which specialized in dolphin fishing, but they proved unviable after just a few years. They were only active within harvesting. Fish-processing as well as offshore fishing were reserved for state enterprises. Two of the co-ops were transformed into state firms. From 1957 onwards there were no fisheries co-ops left in the country. The only existing Bulgarian fisheries co-operative, *The Neptune Fisheries Co-operative* situated outside of the city of Varna on the Black Sea coast, was established recently. All other fish companies are at present state-owned. Before looking more closely at the Neptune co-op, a brief statistical description of Bulgarian fisheries is in order.

Bulgarian Fisheries

According to the most recent FAO statistics, in 1989 Bulgarian fish captures were 102,000 tonnes.² But, total catches varied throughout the 1980s. For instance, in the mid-1980s they reported as 100,000 tonnes, in 1988 117,000 tonnes. As a fisheries nation, in 1989 Bulgaria ranked as number three among the Eastern European countries (after Poland and DDR – the USSR not included).

Only 8,600 tonnes of the 1989 catch was taken in the Black Sea and the Mediterranean, compared to 17,900 tonnes in 1980. This illustrates the increasing relative and absolute importance of the Bulgarian deep sea/distant water fleets for the supply of fish. Bulgaria is a net exporter of fish. The average fish imports between 1986 and 1988 were 1,700 tonnes, while exports totalled 49,200 tonnes. The USSR has traditionally been the main customer. The fishing industry also supplies proteins for internal consumption. The average supply of fish per capita in Bulgaria is 7.2 kg.

Until 1944 the total Bulgarian catch, including freshwater fish, was only 5,000 tonnes annually. This means that the fishing industry has been developed largely from scratch since the Second World War, beginning with a state enterprise established in 1948 in the city of Burgas (see map), and operating on the Black Sea.³

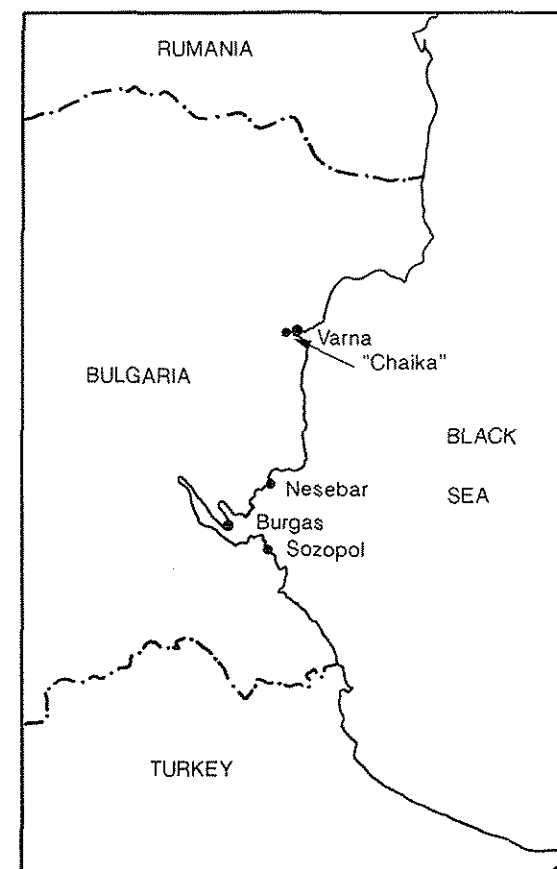
Bulgaria is predominantly an agricultural country, and fishing has traditionally been of minor importance. This changed however in the mid-sixties when efforts were undertaken, largely thanks to the assistance of the Soviet Union, to develop the deep sea fishery. In 1964 the deep sea fishing company *Okeansky Rybolov* was formed. This was also situated in Burgas. In 1981 there were 26 deep sea trawlers, many of them operating in African waters and often in close co-operation with Soviet fleets.

Burgas (188,000 inhabitants in 1984) became the fishery capital of Bulgaria. Today it contains a fishing enterprise specialized on Black Sea fisheries, with local branches in the towns of Sozopol and Nesebar. Another enterprise operates from the large Black Sea coast city of Varna (302,000 inhabitants in 1985). The main commercial species on the Bulgarian coast are the Black Sea sprat and horse mackerel.

All of these firms are parts of a big state owned company – the *State Enterprise for Fisheries* with headquarters in Burgas. This enterprise also has a fish imports and exports unit – the *Bulgar Ryba*. Furthermore, it includes a fish processing factory (the *Slovianka* built in 1973), a large shipyard where most of the trawlers have been built, and two research institutes. In total, the enterprise employs 7000 people, including 1200 workers within fish processing. A similar but smaller state firm located in Plovdiv has responsibility for fresh water fisheries, including aqua-culture. There is no private sector to speak of within Bulgarian fisheries. Neither is there a co-operative sector, except for the one enterprise that we describe next.

The Neptune Fisheries Co-operative

The Neptune Fisheries Co-operative came into operation in January 1989. It initially included 30 fishers, all of them part-time and employing small, privately owned boats. They needed to organize sales more professionally and to improve their bargaining power concerning prices vis-a-vis the government. They also wanted the co-op to



provide supplies, gear, petrol, and the like. The fishers of one community – *Chaika* (the Seagull) – visited by the authors (see map), also claim that the state used to be slow with the payments, sometimes paying less than prices agreed. The state alleged low product quality as the explanation. With the co-op, fishers are now paid immediately upon delivery. Private sale of fish used to be illegal. If caught, fishers lost their catch and were fined 200 Levas.⁴ This regulation was cancelled in 1990.

In November 1990, the co-op had 450 members, including 79 fishers. By law there is open membership in Bulgarian co-ops. Most of the Neptune members are passive, i.e. they are not working in or through the co-op. To become a member one has to pay a fee of 5 Levas and be over 16 years of age. Altogether, the fisher-members are recruited from 15 different communities in the area, most of them fishing part-time with privately owned boats. The co-op collects the fish in three of the communities, *Chaika* being one of these. Members are not obliged to sell to the co-op, and the co-op does not buy shrimps. Indeed, most people live in these communities only in the summer season. Fishing has traditionally been a lucrative part-time activity, particularly in the tourist-season. Average income per year for the fisher-members is 1700 Levas.⁵ Now, however,

the costs of fishing and living are increasing and income is uncertain. The fishers complain that catches have been reduced over the years, something they attribute to the pollution in the area. They do not trust the government's assurance that this is not the cause.

Twelve people are employed by the co-operative in administration and transportation. The main office is located in a residential area just outside Varna. The building is, as real estate in general, owned by the state and rented to the co-op. The same arrangement applies in the fishing communities where members live. The people of *Chaika* were once forced to leave their community, and today they are afraid that they will have to move again because of rumours that the shoreline will be sold to a Greek private investor who wants to establish a tourist hotel. The manager and the members say that, without ownership of the land and the building, the co-op is vulnerable. They hope that privatization will bring a change in this respect.

The Council – a general meeting of members – is the supreme authority of the co-op, meeting every third month, or more often if it is needed. It elects a Board of seven for three years at a time, which is chaired by the manager. The manager, however, was appointed by the co-operative union in the Varna region. In addition to the Council and the Board, there is a Control committee of three members.

The charter of the co-operative is designed by the members, but it is based to a large extent on the standard legal regulations of co-ops. Many of the paragraphs are common to all co-operatives while some are added by the members and reflect the specific local and industry characteristics. As is the case with other co-operatives, the Neptune co-op is allowed to supplement their core activity with involvements in other activities. Today it owns and runs a restaurant, a fish retail store, a mechanical and an electrical workshop. The most recent addition to the co-op's activities is administering 380 taxi drivers. During the current crisis the taxi-driving business has boomed as people strive to supplement their scarce incomes by driving for fares.⁶ According to the manager, the co-op could not have survived economically without these supplementary activities. Fisher-members of the *Chaika* community agree. The decision to diversify has not been controversial among members.

In addition to a membership fee, members have invested capital in the co-op, varying from 55 to 6000 Levas. Table 1. shows the distribution.

There are 70 fishers among the 80 members who have invested in the co-op. Only those who have invested can participate in decision making and profit-sharing. An investment of 55 Levas is the lower limit entitling the member to voting privileges and bonuses. The manager and the assistant manager have also invested in the co-op, 1556 and 650 Levas respectively. Only one of the taxi drivers has share-capital in the co-op. His share is the biggest and amounts to 6000 Levas.⁷ In contrast to the common co-operative principle of remunerating personal participation, bonuses to members are distributed in accordance with their capital share. Last year the bonus was 3 percent.⁸ In this way, income distribution in the Neptune co-op resembles the capitalist shareholder company (cf. Otnes 1988). However, in contrast to a shareholder company, the traditional Rochdale co-operative principle of one-member-one-vote is applied in decision making. The Neptune co-op has fewer than 100 members; thus, the general principle stated in the co-operative law requiring that one delegate be elected to the council for every twenty members, is not applied. From the above it is apparent that the Neptune co-op is a mixture of a capitalist enterprise and a conventional co-op, and

may deserve the label 'capitalist co-operative'. The 'odd' quality of this is that the innovation occurs in a socialist state. This organizational form may, however, help to solve the problems of capital formation and finance which are inherent in the co-operative organizational approach. It may also, in the long run, secure loyalty of members as they have more at stake in the co-op than just their ordinary membership entrance fee (cf. Jentoft 1986).

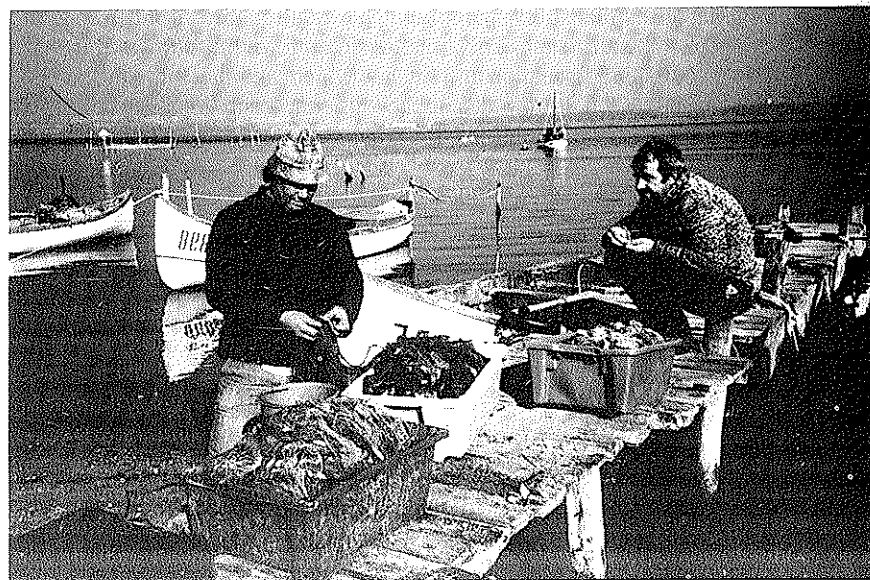
Table 1. Member-share capital in the Neptune Fisheries Co-operative.

Investment	Members
More than 1000 L	6
Between 600 and 1000 L	10
Between 200 and 600 L	15
Less than 200 L	49

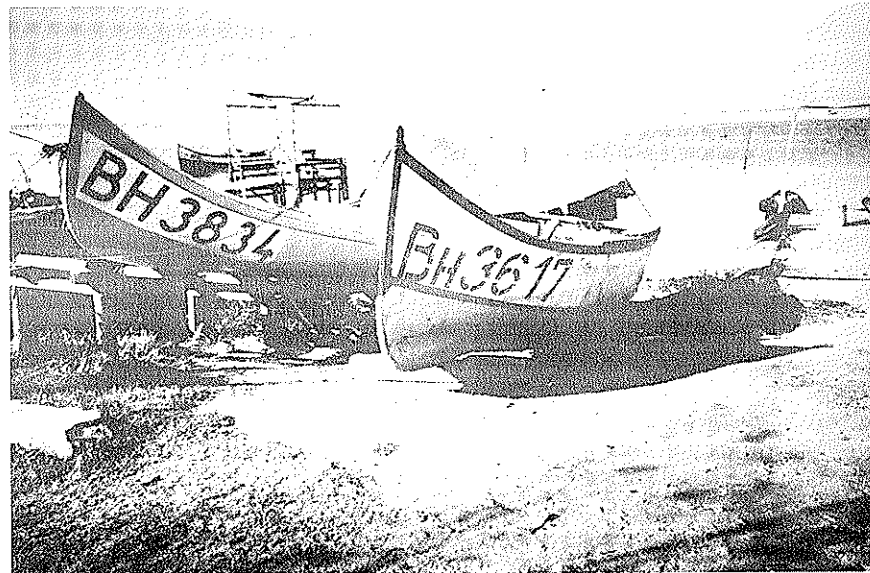
So far the Neptune co-op has been economically successful. Between 1989 and 1991 revenues increased from 40,000 to an estimated 100,000 Levas. A large part of the increase stems from the taxi business, which is the main 'secret' behind the co-op's success. But, it also has resulted from the restaurant business where they serve fish from the co-op. The sale of fish accounts for 54 percent of total revenues. In 1989 fish sales amounted to 31,516 kg, by September 1990 the figure was 27,260 kg. These figures illustrate the small-scale quality of fishing activity. Profits increased from roughly 11,000 to an estimated 60,000 Levas before state (18.3%) and municipal tax (12%) and fees to the co-operative union (10%).

The Neptune is a member of the Varna regional union of co-ops, which has 29 members drawn from various industries under its wings. As there are around 3000 full- and part-time fishers (including deep-sea fishers) in the region, the union wanted a fisheries co-op established. However, except for appointing the manager and providing juridical advice when the charter was drawn up, the union played a minor role in setting up the Neptune co-op. The co-op applied for financial support to buy gear for the fishers and two lorries, but was turned down.

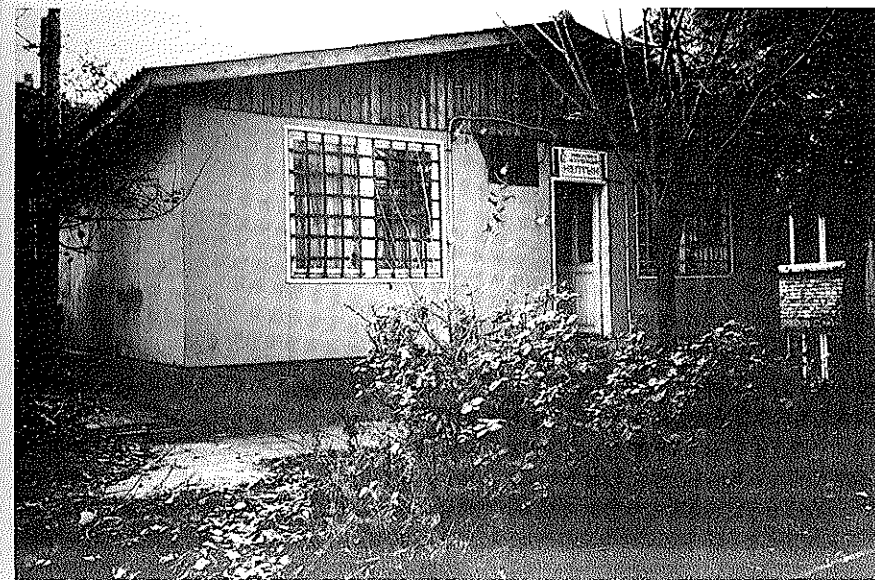
The union is highly controversial. If it was entirely up to the manager of the Neptune co-op, the union would meet the fate as its Polish counterpart:⁹ 'It is nothing other than a bureaucratic hat, and should be abolished.' The union operates in a very autocratic way. For instance, in order for the co-op to get a bank loan, the union must co-sign the application. For the stamp and signature the union charges 10,000 Levas. In practice, this works as a permit and a licence. Without conforming to the union's policy, an individual co-op has no chance. According to the manager, 'Only if you're polite to them and accept all their decisions, you may work.' Membership in the communist party has also been crucial. The co-operative law allows co-ops to diversify into new activities. Therefore, the union could not stop the Neptune's expansion into businesses other than fish, a development essential to the co-op's success.



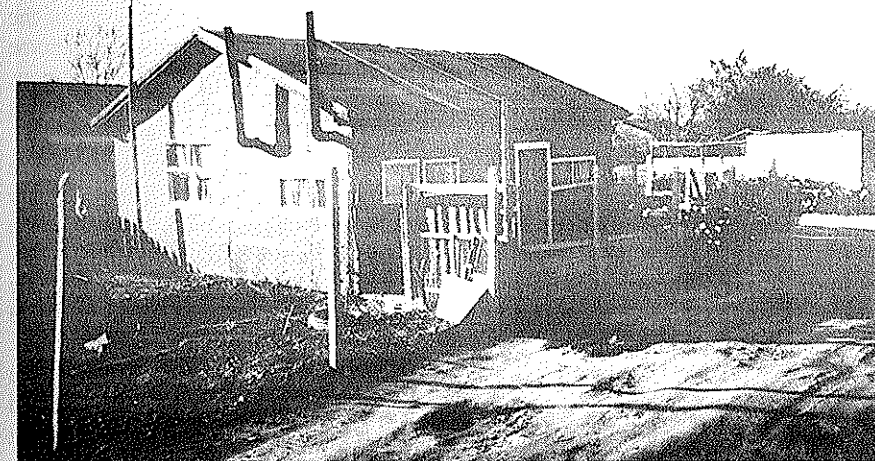
Fishers of the Chaika community.



Boats belonging to the co-operative fishers of the Chaika community.



The Neptune Fisheries Cooperative administration office.



A fishers' home in the Chaika community.

One incident illustrates the nature of the affiliation to the union particularly well. Until now prices to fishers have been decided upon by the government and have remained at the same level since 1973. Last year the co-op decided to introduce calculated prices. The prices on gasoline and gear increased, and the co-op surveyed the local market to determine the price customers would accept. Accordingly, prices both to consumers and to the fishers were raised by 50 percent. For this, the co-op was punished hard. It was fined 20,000 Levas – half of the year's profit and three times what the co-op earned by raising the prices. The Central Co-operative Union asked for the manager's dismissal and a personal fine of three monthly salaries. He had to pay this. However, the manager later got it back from the union with a warning that more severe action would be taken if the practices were repeated.

Despite the rather distressed relations between the Neptune co-op and the co-operative union, there are reasons for optimism. In the new political climate it is easier to talk freely and to criticize the system. However, a fear of backlash and negative outcomes remain. The co-operative union still has the power to remove the management. Moreover, since the co-op does not own its own buildings, it has no guarantee that it can keep them in the future. At present there is a discussion occurring within the union concerning the extent to which a co-op should be allowed to own property. Seen from below, this is a crucial issue. As noted by the Neptune manager: 'If not, we can never be a true co-operative. This is one of the conditions on which self-management rests.'

Another factor of great relevance for the co-op's autonomy is the price question. At present the co-op is not allowed to benefit from the high demand for fish in the consumer market. In deciding the prices both on output (fish) and input (gear, property rents, interest etc.) and with no private market for fishing equipment, the state has full control over what co-ops can do. Those fisheries co-ops that went bankrupt in the 1950s did so because they were not allowed to compete freely with state firms. Thus it follows only logically that the manager is supportive of the implementation of a market economy with free prices.

A third issue pertains to membership. Today, co-ops are open to all irrespective of their other linkages to the co-op. Here the opinion among fisher-members of the Neptune co-op is clear: Only people active in the co-op should be permitted to become members and only they should have the right to elect their management. Until now, the manager has been appointed by the co-operative union in conjunction with the Communist Party.

The manager, an economist by training, has thirty years of practical experience within shipbuilding, mechanical industry, and butchering. For four years, until January 1988, he was in charge of a consumer co-operative which was much larger than the Neptune. Conflicts with the chairman of the regional co-op union forced him to quit, despite the fact that the enterprise worked very well.¹⁰ As the manager remarked during our interview: 'This is just another sign of the undemocratic nature of the co-operative movement in Bulgaria.'

Without any prior knowledge of fisheries when the Neptune co-op started, the manager feared that he would fail and suspects that the union would have welcomed such an outcome. During the first four months of his appointment he visited the fishing communities in the area and talked to fishers, encouraging them to join the co-op. Friends helped with advice and finance, without which the manager could not have

succeeded. This was also critical to the start-up of the restaurant as well as to the sale of fish that was channelled in the beginning through his old co-operative. Today, the fish is retailed through the co-op's own store or through state channels.

In sum, the story of the Neptune co-op, despite its success, may serve as a good illustration of the reality behind the facade of the co-operative movement in Eastern Europe. It describes how the system is experienced on a day-to-day, ground level basis. Officially, the classic Rochdale principles are intact; but, as is evident in the co-operative charter, in practice the co-op has to struggle with a peremptory union bureaucracy which makes self-management fictitious. However, the Neptune co-op demonstrates that Bulgaria is not unaffected by the developments that are currently taking place in Eastern Europe. When talking to the members and the management of this co-operative one can sense the new spirit, the enthusiasm and yearning as to the prospects of privatization. Nonetheless, much of the old paternalistic structure is still intact. It remains to be seen how long the Neptune co-op will remain the only exception to the rule of state ownership in the Bulgarian fishery.

Privatization: What about Co-ops?

Bulgarian and Polish fisheries co-operatives share many of the same experiences and consequences of living under communist rule for decades. In both instances, the principles of self-management and participant democracy were undermined by a peremptory state bureaucracy, preferential treatment of state firms, and a 'paternalistic' co-operative union controlled by the state. In Poland these structures have now been removed and fisheries co-ops find themselves in a more autonomous position (Jentoft and Marciniak 1991). The tendency in both sites is for new co-operatives to form within the fishing industry as the state sector is being dismantled.

It is too early to predict what will happen in Bulgaria. There are many changes under way which point to outcomes similar to those evident in Poland, but in some ways the situation is notably different. While Polish fisheries co-operatives prospered under communist rule, their Bulgarian counterparts vanished. A part of the Polish economy was never nationalised, remaining private up to this day. In Bulgaria, nationalization was much more all encompassing, private ownership was totally abolished (Davidkov 1991) and '...the existence of any independent organizations, even purely non-political ones, was inadmissible' (Mishkova 1991:31). Also, the Communist Party was wiped out during the Polish national election. In contrast, its support among Bulgarians is still strong as was demonstrated in the 1991 general elections. Although the Communist Party, under a new name, was reduced to a minority position in the parliament, it has enough votes to block privatization reforms. As stated by the editor of *Bulgarian Quarterly*, there are also other obstacles to consider:

The major problems of privatization proceed from the fact that a large part of Bulgarian capital is controlled by the former economic 'nomenclatura.' There is every possibility for the strata of new owners in Bulgaria to be made up of two irreconcilable social groups – that of former owners expropriated by communists who will now justly be required, and the group of the economic 'nomenclatura' which will be able to buy up state property in the privatization process.¹¹

This study was carried out during turbulent economic and political times in Bulgaria. There is a shortage of most consumer goods, and the queues in front of the food stores are long. Energy supplies are scarce, petrol is rationed and electricity is off and on continuously – ‘Bulgarian disco,’ people say sarcastically. More than 60 percent of the population live below the poverty line. Young people are lining up in front of Western embassies and consulates for visas. Indeed, 410,000 people, chiefly young and educated, have left the country in the last few years, and many more would leave if they got the chance (Genchev 1991). The political situation is also unstable. In the summer of 1990 there were big demonstrations, and the Communist Party headquarters was set on fire. When we visited Bulgaria in November 1990, students were on strike all over the country, and there were demonstrations in front of the parliament. These demonstrations continued throughout 1991.

A new co-operative law is being discussed. The manager of the Neptune co-op is quite hopeful that conditions for co-ops will improve. According to Professor Georgi Kostov of the Bulgarian Academy of Science, the general attitude among ordinary people is that co-ops are viewed positively because of their historical roots.¹² This also applies to the fishery because of experience with the *daljan* system. The general perception is that there is conflict between state and co-op enterprises but not between private enterprise and co-ops. Professional economists tend to agree with this. A new concept of ‘social capitalism’ is being discussed, and co-ops are seen as part of it. People interviewed by us within the independent trade union expect that the new co-operative law will allow workers’ co-operatives or ‘syndi-co-ops.’ However, nothing had been finalized when we visited the country. Whether or not the national and regional co-operative union will meet a fate similar to Polish experience is an open question.

Some parts of the old co-operative law seem to be particularly in line for reform if Bulgaria is leaving state command for a capitalist market-like system. The first paragraphs of the Neptune charter apply to all co-ops in Bulgaria. Paragraph 1.2 states that the co-op is ‘an integral part of the socialist organization of our people’s economic system.’ Furthermore,

The co-op presents itself as one of the forms to attract people and make them actively participate in the building of the socialist society and for communist education... The fishing co-op is a mass social state organization which freely organizes employees. This is the next stage in social and economic development of our state.

With such ambitions on behalf of co-operatives, one should expect that ‘the average Bulgarian’ would think of co-ops as public/socialist rather than private/capitalist enterprises, an organizational form more aligned with the old society than suitable for the new one. The positive attitude to co-ops in Bulgaria today may come as a surprise. While the former regime regarded co-ops as a vehicle on the road to socialism, the new government now perceives the co-op form of organization as a step towards capitalism. The negative attitude towards the communist notion of co-operatives and their purpose has not compromised the original co-operative ideas and principles as such. However, as Bulgaria is advancing towards a market economy, it follows logically that these paragraphs will have to be modified – if not excluded. Additionally, the defining idea of what a co-operative is would have to be redefined, or rather restored, to what it used to mean to Bulgarians before the communist regime took over.

The extent to which co-operatives will be successful in Bulgarian fisheries, given promotion of this organizational form is not just a matter of external conditions such as national legislation. The Western experience as well as the lessons that can be drawn from the promotion of fisheries co-operatives in Third World countries indicate that their viability will also hinge on factors internal to the co-operative, factors such as the quality of the management, the loyalty and support of members etc. (cf. Poggie 1980; Jentoft 1986; Polnac 1988; Davis and Jentoft 1989). In many cases co-ops are just not able to compete with private alternatives. Thus, a not unlikely scenario for future Bulgarian fisheries co-ops is that, in spite of government support, fishers will still prefer the private option if they were free to choose. Extensive efforts to educate both membership and management of the potentials as well as the problems and pitfalls of the co-operative model will be required if the co-op initiative is to become successful with the introduction of a true market situation.

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Notes

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2. *FAO Yearbook*, Vol. 69, 1969.

3. This section draws heavily upon a study by Thomesen (undated).

4. In 1990 1 US dollar was officially equivalent to 10 Levas.

5. In comparison, full-time fishers and fish-plant workers in a state firm operating on the Danube river near the city of Ruse, also visited by the authors, earned 3000 Levas per year. However, co-operative fishers have to cover costs on boats and equipment which are free to state-employed fishermen.

6. The co-op takes care of the paperwork and provide supplies, for instance petrol rationing cards. If supplied by the co-op, each taxi driver (and fisher) gets an extra 20 liters of gasoline per month, which is twice what they would get if they were privately operating. This explains the interest in affiliating with the co-op. However, only one taxi-driver is a member of the co-op.

7. We have no information as to the background and profession of the remaining 7 members.

8. For 1990, because of the good economic results, some members have requested that the percentage should be raised to 6-7.

9. We tried to get in touch with the central as well as the regional co-operative union, but, unfortunately, they could not find time for us.

10. Of 109 members only seven voted for his resignation.

11. *Bulgarian Quarterly* 1(3):7.
 12. Personal interview.

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Practical Implications of Chaos in Fisheries

Ecologically Adapted Management

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ABSTRACT This paper discusses the practical implications for fisheries management if fish populations behave chaotically. The paper argues that the principal effect of chaos is manifested in terms of information and measurement problems. In particular, recruitment based policies are likely to require unattainable measurement accuracy and lead to unpredictable outcomes. This raises questions about how sustainability can be maintained in chaotic fisheries. The paper suggests that management based on the relatively stable ecological relationships in fishery systems may be the most practical way to manage chaotic fisheries. It also hypothesizes that successful cases of traditional (community) resource management are likely to be based on qualitative ecological approaches rather than the direct quantitative manipulation (e.g., quotas) of exploited populations.

In a recent article and comment Estellie Smith (1991) and Chris Finlayson (1991) discuss the implications of chaos theory for fisheries management. Both Smith and Finlayson describe chaos theory as a competing paradigm for the conventional 'linear paradigms'¹ of fisheries management. With only minor quibbles we agree with their perspective of the problem and would simply like to add to their discussion a few points concerning the practical implications of chaos in fisheries.

To begin, what we mean by a chaotic fishery is one in which the time path of abundance of individual species has no equilibrium tendency but varies unpredictably within certain limits. This contrasts with standard theory (including its stochastic versions) that assumes population abundance tends towards some predictable equilibrium value.² As we point out below, there is a great difference between the two theories regarding the kinds of useful knowledge about fisheries that we can realistically acquire and, as a consequence, the kinds of practical management controls that can be exercised over fishery populations. In a very basic way, the presence of chaos transforms the management problem into a question of what we can hope to learn, the conditions under which that learning can take place and what we can hope to control. Our major conclusion is that the best hope for successful management of chaotic fisheries lies with 'ecologically adapted' management, i.e., policies that rely upon the relatively stable ecological interactions in the system.

If a theory of chaotic fisheries is (or were to become) a competing scientific approach to fisheries, there is an important question about how scientists and practitioners might choose between theories of chaotic and equilibrium (i.e., standard, or conventional)