FISHERIES TRAINING IN THE UNITED KINGDOM FOR OVERSEAS POSTS*

by

C.F. Hickling
95, Greenway,
London N 20, U.K.

ABSTRACT

It was early realised that fisheries development and extension is a different art from fisheries research, requiring different qualities, different training, and a different time-scale. Each is and should be a full time job.

Training for research officers offered no difficulty, since fisheries research overseas was on extension of the methods developed and used at home research stations. Trainees were sent to take individual courses at the appropriate research stations, according as to whether the officer would work in freshwater or marine stations. A general view of research methods was followed by more intensive practical training in the trainee's future speciality.

But no course of training for Fisheries Officers existed, and one had to be devised. For Fisheries Officers destined to work among peasant fishermen, technical training should include a long period of practical experience on small power-driven fishing craft not exceeding about 40 ft. in length. Training time spent on large deep-sea fishing craft would be largely wasted, since the socio-economic condition of most fishermen in the undeveloped territories usually puts them out of reach of such highly-capitalised and complex fishing methods; whereas they can reasonably hope to graduate to small and efficient power-driven boats.

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Courses of training for the Fisheries Officers should also include training in engine maintenance and repair, on the design of fishing gear as well as the making, fixing, and repair; on the handling, preservation and marketing of fish and prawns, the economic/marketing side including the organization of marketing surveys; the collection and use of fishery statistics, and some understanding of fish population dynamics. A course of fish identification with especial regard to the most important food-fishes of the officer's future territory should round off the training.

This should be regarded as a preparatory course, which should be followed up, after the officer has done his first tour of duty, by a supplementary course to amplify aspects which he has found especially important, or which were omitted from the preliminary course.

INTRODUCTION

A British Colonial Agricultural Service was created in the 1920's, and it was created because overseas Governments saw that the traditional methods of cultivation and husbandry were not productive enough either to give prosperity to agricultural communities or to provide an adequate basis of nutrition for the people. Means had to be found to make the indigenous cultivations aware of better methods; and Agricultural Departments were set up for the slow and difficult task of testing, under local conditions, and then propagating among apathetic peasant cultivators, methods likely to raise productivity of food crops; and also to introduce the cultivation of cash crops which might earn foreign exchange. Agricultural Stations and Research Stations were established in each territory to tackle local problems, and Agricultural Officers were recruited for extension work. Finally, the world-famous Imperial College of Tropical Agriculture was founded in Trinidad for fundamental research in tropical agriculture.

Agricultural Officers were recruited from graduates with degrees or diplomas in Agriculture or other approved branch of biology, and they received further specialised training for tropical conditions at the Imperial College of Tropical Agriculture.

This organisation was for Agriculture, which has always been, and still is, the most important single industry (or way of life) in almost all overseas territories. The case was different for Fisheries, which is also a primary-producing industry. Scant attention was paid to the wellbeing and improvement of the fisheries, except in Malaya and Hong Kong, until the last War (1939-45) brought food shortages and rising prices in the overseas territories. Then, in several of the territories, officers, seconded from other departments but with no specialised knowledge, though often with great interest in Fisheries, were given such titles as Fishery Development Officers, and were charged with the duty of trying to organise greater productivity in the fisheries. This always has been and still is, difficult, because fishermen not only shared the general peasant suspicion of change, but because they are seldom grouped into large enough communities to make contact easy and improved facilities economic. Moreover, these temporary officers were handicapped by a shortage of every kind of fishery equipment.

But, when the war ended, fisheries were included in the enlightened and generous policy of development of the British overseas dependant territories financed by the successive Colonial Development and Welfare Acts. As in the case of Agriculture many years earlier, it was plain that methods and attitudes must be altogether changed if effective fishing industries were to be built up.

There was little to start with. There was no body of men trained and experienced in fisheries development to send overseas. There could, in fact, not even be the appointment of officers to undergo training, until the overseas territories made a requisition for them. No University nor Technical Institute in Britain gave a diploma course nor indeed any course in Fisheries. The Grimsby Nautical School and similar schools give training to fishermen. In 1923, a far - sighted Grimsby trawler-owner, the late Mr. James Roberston, tried to organise an Association of British Fisheries, which, among many other desirable things, would have included comprehensive training; but he could get little support in the industrial climate of the time.

Therefore an overseas fisheries organisation had to be built up, and the Agricultural Service was taken as an example. Two kinds of Fishery staff were distinguished, namely, Fisheries Officers and Fishery Research Officers. The former corresponded to Agricultural Officers and were in fact placed on the same salary scales. Their duties were to be fisheries extension development and administration. The latter were to be whole-time research officers.

Though there may be some overlap in their duties, especially in operational research and statistics, the work of the two classes of officer is of a different order, and it was considered impracticable to combine them. The time-scale of the work which each officer does is also different. Fishery Research, like other research, is essentially a long-term enterprise, needing decades rather than years for its fruits to become applicable. But the need for a technically expanding fishing industry, of rising productivity, to cater for human populations which may be doubling every 30 years, cannot wait for decades. Fishery extension and development have some element of urgency.

Fishery research, which deals with matters such as maximum standing crop, and permissible cropping rates to ensure maximum long-term yields, is a time-consuming exercise. It needs basic estimates of primary production rates, through chemical and plankton studies, and plant production; growth-rates of individuals and populations of organisms in the food-chain leading to fish; and, among fish themselves, migrations, growth-rates, mortality rates, effects of gear-selection, breeding rates and many others. Here is work for much larger and costlier staffs overseas than most Governments have seen fit to support. Though finally development must be guided by the results of research work, it cannot in present conditions wait for them. Ideally, a fishing industry should have grown to the point where exploitation is approaching its optimum at about the same time as research can show what that level is and how it can be maintained.

It is unrealistic to ask a research worker to undertake extension and administrative work (except when he is Director of a research station) in addition to his full-time research; and equally unreasonable to expect a Fishery Officer to find time for biological research in addition to his technical and administrative work.

Fisheries development and extension needs business ability and a capacity for leadership, as well as technical knowledge. Though it has become traditional to recruit Fishery Officers from the ranks of University graduates in Zoology, a gift for leadership and administrative flair are much more important in this context than a distinguished degree, where both cannot be found in the same candidate. He must not only guide the improvement of his fisheries, but study the socio-economic conditions and incentives of the fishing community which may make such improvement desirable in the judgement of that community. Careful preparation must often precede the introduction of more productive methods, and especially mechanisation, which needs more capital investment, and may involve the administration in loans schemes. The Fishery Officer must also advise his Government on general fisheries policy, on fishery regulations where necessary, on the effect of foreign investments in fisheries on the local fishery interests. So he must have the gift to use Government procedure and collaborate effectively with other Government Departments.

But a Fishery Officer must obviously have a basic technical training. It was originally planned to give a short general course before the officer took up his post, and then a more specialised course when the officer had completed his first tour of duty and knew what further training he wanted. In practice, however, in few cases were such further courses asked for.

It was decided at the outset that the demand for Fishery Officers would not be large enough to warrant the establishment of a training institute for this purpose. So a course of training had to be peripatetic, the trainees moving from one place to another. This raised problems of transport and accommodation. No attempt was made at a standard course. It was varied and improved after consultation with each batch of trainees, at the end of their course.

A difficulty in planning fisheries courses in the United Kingdom, for officers destined to work in undeveloped countries, is the nature of the fishing industry in Britain,. Appropriately to a higher industrialised country, over 98 percent of all the fish caught is by medium or large powered fishing vessels, of a cost and complexity far beyond the means or experience of almost all the overseas fishing communities. And though private capital is available in the undeveloped countries, it is seldom risk-capital prepared to invest in expensive fishing vessels. The original coastal and inshore fisheries of Britain have been almost wholly superceded by these industrial developments; and yet only among coastal and inshore fisheries are conditions at all comparable with those of the undeveloped countries to be found. To one familiar with the general British fishery scene, the low level of production and productivity in overseas fishing communities comes as a surprise, as well as the peasant fisherman's lack of resources, his extreme conservatism, and the great diversity of his production methods.

Therefore in trying to prepare Fishery Officers for their duties in improving production, distribution, and marketing of fish, they should become familiar with our inshore fishing economy, using small and comparatively inexpensive powered fishing boats such as would represent a possible first step upwards from paddle- or sail-driven canoes and boats, and a diversity of fishing methods. It was soon found to be unrealistic to devote the time of Fishery Officers in training to voyages on deep-sea trawlers. Because of the eclipse of its inshore fisheries, Britain is at a disadvantage as compared with those countries where the inshore fisheries are still a flourishing and developing concern.

Further, a number of minor fisheries of little importance in Britain are very important in the overseas territories. For example, prawn fisheries are a major item in most tropical and sub-tropical marine and estuarine fisheries, producing a crop which has a high value both for domestic consumption and as an export. But they are hardly represented in the British fisheries. Fisheries for molluscs, very important overseas, are of little importance in Britain apart from oysters. The fisheries for oysters, clams, cockles and abalone in the overseas territories are relatively far more important than Britain's desultory mussel, cockle, whelk and winkle trades. The nearest Britain seems to have to a prawn fishery is the recent interest in the so-called Dublin Prawn, *Nephrops,* long known but thrown away, as a by-product of medium-water trawling. Brackish water fisheries for prawns and mullet, often operated by fixed fishing engines, no longer exist in Britain.

Again, Britain has no important commercial freshwater fisheries. The inland waters are used for recreational fishing. Training in fresh-water fishing methods is therefore difficult. There is also no fish farming industry. Such fish farms as exist are chiefly concerned with trout rearing, with a specialised technique of limited value to officers who may be concerned with demonstration of fish-ponds for the growing of herbivorous and omnivorous Cichlid and Cyprinid fish for subsistence and sale. The climate of Britain, with only 180 to 200 growing days a year, makes such fish culture uneconomic in competition with the marine fisheries; yet fish culture is important in undeveloped countries which have high ambient temperatures and a long growing season, and where the sea fisheries may be poor.

But fish culture is a branch of animal husbandry, while the development of wild fisheries is controlled hunting. Probably staff for fish culture research and development would best have been recruited from people with training in Agriculture, since the approach should be from the angle of livestock production rather than that of freshwater biology. In the Congo, Belgian agronomists made a notable contribution to the extension of fish culture there.

In planning a course of training in fishery methods likely to be of practical use in undeveloped countries, it was necessary to distinguish between marine and inland fisheries. As has been stated above, Fishery Officers were recruited only on requisition from one of the overseas territories, and for that territory only. As many territories have no seaboard, or where there is a seaboard but inland fisheries are obviously likely to be the more important, many of the trainees would be concerned partly or wholly with inland fisheries. So the courses had to be to some degree individual, according to the type of fisheries the officer would administer. Some items of training were felt to be basic to all Fishery Officers, and these are listed below:

(a) Three to four weeks at the British Museum of Natural History, learning the identification of fish and especially the more important of the fishes of the territory to which each Fishery Officer will be sent. These courses were very well done, and often provided handy keys for field identification.

(b) A short course of reading at the Horace Plunkett Foundation in London, on the principles and organisation of Co-Operative Societies.

(c) A short course at Messrs. Crookes, on the preparation of vitamin-rich fish oils, at that time of great interest, on the raw materials and their preparation.

(d) A 3-week course on the repair and maintenance of diesel engines. For this course, the trainees were split up into parties, and several firms gave facilities. At first, not all the firms took the course seriously, but those which did gave trainees good practical experience in taking down and assembling small diesels engines, and in diagnosing and correcting faults. Where possible, the course included the installation and lining-up of engines and propellor-shaft. At the time when the courses were in operation, the gasoline outboard engine was not favoured as a means of mechanising for the hard service of commercial fishing. But the portibility and other advantages of the outboard engine in fact outweighed the disadvantages; and the recent great expansion in the use of outboards would now make it desirable to include the care and maintenance of outboard engines and how to deal with the commoner running faults.

(e) The Echo-sounder, as an adjunct to fish location, in addition to its use for sounding and navigation, is so important to Fishery Officers that they took the short course in its adjustment and maintenance given to officers of the Merchant Service. Agencies and repair facilities for these instruments are few and widely-separatedin the undeveloped countries. By being able to do his own minor repair and adjustments the Fishery Officer could save much time and money.

(f) A month was spent at the Grimsby Nautical School, a rate-aided vocational school for learner-fishermen, and for candidates for local certificates as Bo'sun, and Board of Trade certificates of Competency as Mates, Skippers, and Extra Skippers. By courtesy of the Principal, a special course was laid on for the Fishery Officers. This course included the making, fixing, and mending of trawl nets and was well done. It was felt that a Fishery Officer would be in no position to demonstrate, and try to propagate, a new fishing gear unless he was personally familiar with its construction, and had the technical knowledge to adapt a method to suit local conditions.

There was also a short course in chart-work, position-fixing, and simple pilotage. Visits were also arranged to ice-factories, cold stores, and to see the sale of fish and the packing and despatch. Offal-disposal and fish-meal factories were also seen.

(g) Because the course at Grimsby was exclusively concerned with the trawling aspect of fishing, natural at the greatest trawling port in the world, trainees spent a few days, as convenient, at the works of manufacturers of diverse kinds of fishing gear, such as gill-nets, trammel-nets, and seines, made of cotton, flax and synthetic fibres. Bridport, Midlothian, and Kilbirnie were included in these short visits.

(h) To see at first hand inshore fishing methods from small powered fishing craft, a few weeks were spent with inshore fishermen at Eastbourne (trammel-nets, drift-nets, fish traps) or B-er and Seaton in Devonshire (inshore trawling, drift-netting).

(i) The most important part of the course concerned with the handling, preservation, and marketing of fish was done at the Torry Research Station of the Department of Scientific and Industrial Research. This course was one of those most appreciated, and covered as thoroughly as the time permitted the theoretical aspects of fish spoilage and the means of combating this and prolonging the stored life of the fish. Practical work was organised, and was a welcome and particularly valued feature of the course.

(j) A short course in canning fish was given by Messrs. The Metal Box Co. Those Fishery Officers likely to be concerned mainly with sea fisheries also took some or all of the items set out below.

(k) Ten days at the port of Tarbert in the Firth of Clyde, to see ring-netting for herrings, long-lining, and Danish seining.

(l) A few days at Morecambe, where there is a small but prosperous shrimp-trawling industry, with an active co-operative society for supplying materials and for marketing the catch, which is partly processed.

(m) A visit to the Ministry of Agriculture, Fisheries and Food's laboratory at Conway. Here a valuable short course was given on oysters and mussels, including spat collection and relaying, and the management of shell-fish beds.

(n) A visit to the Ministry of Agriculture, Fisheries and Food's laboratory at Lowestoft, for discussions on marine fisheries and their regulation. The chance was also taken to visit inshore fisheries for crabs, lobsters, and whelks on the Norfolk coast.

(o) Two or three of the last men trained were able to see, with their permission, the method of midwater-trawling for sprats, in conjunction with the echo-sounder, pi-oneered by Messrs. Leggatt, of Whitstable, Kent.

Those Fishery Officers likely to be mainly concerned with freshwater and inland fisheries usually had, in addition to items (a) to (j), some or all of the items below.

(k) Three weeks at the Freshwater Biological Association's laboratory on Lake Windermere. A good course was given in freshwater ecology, with instruction in apparatus and methods. Fishing was shown with gill-nets and fish traps, and the effect of mesh selection.

(l) A few days at the University of Glasgow's field station on Loch Lomond.

(m) A visit to the Scottish Home Department's research station at Pitlochry, for migratory fishes, fish passes, and the rearing of young Salmonids.

(n) A course of elementary surveying at the Imperial College of Science's field station. This course was highly ap-preciated; it was very practical and its object was to enable a Fishery Officer to make a round of levels to help him to advise whether a site is suitable for a dam or for fishponds.

(o) Where possible, officers who had taken the course in surveying were given a chance to see earth-moving, levelling, and ditching operations with the Engineer's Departments of River Boards.

The usual duration of the course, whether for marine or for freshwater Fishery Officers, was about 8 months, including breaks for Christmas and Easter. The courses usually began in October and ended in May or June.

FUTURE COURSES FOR FISHERY OFFICERS

These courses lapsed in the late nineteen-fifties with the completion of requisition for Fishery Officers from the dependent territories, and with the change-over of these to full independence. Nevertheless, experience was gained which may be useful where future training courses for Fishery Officers, as distinct from Fisheries Research Officers, are to be organised. It has been explained above why there should be this distinction, and why Fisheries Officers are, probably, more important at the present time than research officers.

In this review I have been greatly helped by the courtesy of Fishery Officers who took the courses of training described above, and then had many years experience in Malaya, Singapore, Aden, Uganda, Zambia and Jamaica. The following text incorporates their comments and suggestions.

There was general agreement that the courses did provide a general basis or framework to which subsequent experience and knowledge could be added, and the practical side of the training, involving handwork with fishing gear, was especially useful and should have formed a larger part of the course. Apart from the need for a Fishery Officer to be able to make up experimental fishing gears for himself, it is common experience that the confidence of fishermen is not easily obtained unless they are satisfied that the Fishery Officer has practical knowledge. The courses also encouraged Fishery Officers to look at problems from the fisherman's viewpoint.

It was felt, however, that the courses should have included the installation and maintenance of cold storage, the organisation of market surveys, and the principles of fishery research, since the Fishery Officer frequently collaborates with research teams. A knowledge of the principles of population dynamics would also help to assess the value of proposals for fishery legislation.

Probably future courses should consist of about one year's general training, in the items listed below, followed by one tour of duty in the territory which employs the Fishery Officer. At the end of this first tour, Government should be persuaded to give the Fishery Officer a further course of, say, six months training in subjects found to be especially important in the territory concerned but which were not included, or were insufficiently covered, in the general course.

Experience in the inshore small-boat fishery is more important than in the deep-sea fishery, since the majority of fishermen in undeveloped countries, who wish to do so, can hope to graduate to small power-driven fishing craft involving only a moderate capital liability. Highly-capitalised deep-sea fisheries, if developed at all, will probably be by foreign capital and expertise.

(a) At least three months should be spent on the maintenance, construction, and operation of small fishing craft of, say, less than 40 ft. length; on the structure and lay-out of deck machinery; and on the practical experience in the handling of various types of fishing gear, and the making, fixing, and mending of as wide a range as possible of fishing gears, including fish traps.

(b) There should be a one-month course in the design of fishing gear.

(c) A one-month course on the care and maintenance and repair of small diesel engines and small outboard engines. This should be done at the works of agents or manufacturers willing to give the trainees practical instruction.

(d) A course on the adjustment, care, and maintenance of echo-sounder and radar, as given to merchant seaman.

(e) A 3-month course on the handling, preservation, and distribution of fish, and prawns including practical work; on fish by-products; on the installation and operation of cold-storage equipment.

(f) A one-month course on the economics/marketing side, including the organisation of market and distribution surveys.

(g) A short course on the general principles of fishery research, on the collection and use of fishery statistics, and on the population dynamics of fish.

(h) A short course on the management of shellfish, spat collection, re-laying, and hygiene, and on fisheries for prawns and crabs.

(i) A three-week course on the identification of the most important commercial fish of the territory.

For the Fishery Officer who will be mainly concerned with inland fisheries, short courses should be taken also in the principles and construction of fish passes, and in simple surveying.

FISHERIES RESEARCH OFFICERS

Training for these officers offered no difficulty. Unlike training for Fishery Officers, which was a new venture, the staffing of the overseas research stations followed conventional lines. It was seldom possible to fill vacancies with experienced research workers,so newly-graduated honours degree men were selected and trained. As with the Fishery Officers, Fishery Research Officers could only be selected and trained against individual requisitions for staff. The candidate's place of work, and even his future speciality, were therefore known in advance, and his training could be planned accordingly.

Therefore no attempt was made to plan courses of instruction, but each officer trainee was sent on an individual basis to whatever instituion seemed most appropriate and was able to take him. Officers requisitioned to work at freshwater stations usually did their training at the Freshwater Biological Association's Laboratory on Windermere, though, in two cases, officers were sent for a part of their course to famous research stations in Sweden and Denmark.

Trainees destined for marine research stations usually took a course at the Marine Biological Association's Plymouth Laboratory, or at another of the marine research stations.

The training was left to the discretion of the Directors of the stations to which the trainees were sent; but it usually consisted of general experience in research methods, followed by more intensive practical training in the trainees' future speciality. These courses have resulted in published papers.

The total length of this post-graduate training was usually about a year, and this sometimes raised a difficulty. In recent years the Ph.D. degree has become very desirable to research workers. But British Universities require residence at the University for two out of the three years of post-graduate research needed to qualify for the degree. But to give two years of training would be inconvenient in cost and time. Overseas fisheries research stations were not affiliated to local universities, where these existed. These were handicaps in recruiting research men ambitious for an early Doctorate.