

DEVELOPMENT FROM ABOVE AND THE BLUE REVOLUTION:

The Indo-Norwegian Project in Kerala *

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1. Introduction

In this article a general theoretical perspective and a general method of analysis that in our experience is applicable to very many development projects, will be presented.¹ We have used as an illustration the Indo-Norwegian Fishery Development Project in Kerala, the southern-most state in India, or, more precisely, the effect of that project in the villages where it was initiated, Sakthikulengara and Puthentura, located between Cochin and Quilon towns, on the Malabar coast.² In no way is this an effort to present a complete evaluation of the project, or even to come at all near the rigor that should be demanded of an empirical analysis. Rather, it is an effort to elucidate what seems to the author to be the most salient feature of the project - a project which, like everything human, has all kinds of ramifications and benefits and costs in all directions. There is insufficient data basis to prove all the hypotheses indicated, but on the other hand there is sufficient basis in the evidence from residents in the area, from very many others who in one capacity or the other have lived there or participated there to indicate that the picture we shall draw, although drawn with very heavy contrasts, communicates something of importance. At any rate, we are prepared to defend this picture relative to heavily documented pictures of what to us seems to be rather insignificant or bureaucratic achievements of the project.³

Initially, this project had only one important goal: to improve the living conditions for the poor along the coast, particularly for the very poor population of fishermen.⁴ In very concrete terms any measure of success for the project should be in terms of increased standard of living in general and calorie-protein consumption in particular, at the bottom of these villages societies. All other criteria of success should be regarded as deviations from the original goal.⁵ Hence, our vision of the project is based on the assumption that the original goal, one

related to living standard, to the level of living of the lowest, was the goal; for what else is the purpose than serving humans?

In order to analyse what happened, not in bureaucratic detail, but with a view to amphasising the salient features, let us turn to our very simple analytical tools.

2. On economic cycles.

Some major aspects of the principal economic activity of these villages, i.e. fishing, can be illustrated in this simple little economic cycle:

Figure 1. The traditional economic cycle for fisheries.



The point of departure, as in all economic cycles, is nature (n). This is the ocean washing the Malabar shores, and the producers (p) in the traditional cycles are the fishermen in their wooden canoes, and further south in their katamarans, managing with age-old techniques to get some of the produce of the ocean into their boats.⁶ The gear is simple, the fishermen are plentiful, the catch is meagre, the economic productivity is low. But it is landed, and marketed to the consumers, a considerable portion of which are identical with the producers (self-consumption). These consumers give waste-products back to nature, human waste, inedible parts of the fish, and so on. As usual nature is the loser in this uneven game with man: what nature gets is rather negative relative to what is taken away. However, in the traditional cycle one could hardly speak of much depletion (of fish), or of heavy pollution (by waste products) - low depletion and low pollution to a large extent being related to low efficiency.

Thus, it is probably correct to say that there was a certain ecological balance where this cycle is concerned, although the point should not be carried too far: it is romantic to assume that nature is in balance when it is untouched by man. But it is definitely true that the economic cycle was so limited, so small to put it in simple terms, that there was little alienation due to the extension of the cycle. The fisherman standing on the beach in the early morning, about to launch the canoe, had all points in the cycle within his horizon. He himself was the producer, nature was in front of him, the consumers right behind

in the village, and in some of the neighbouring areas. There were simple reasons why the cycle was so limited: with the canoes he could not go far out into nature, with the nets he could not go deep down (as with trawls), and preservation methods were so primitive that the marketing radius was rather limited.⁷ In short, he was part of an economic cycle everybody could understand; everybody knew from where things came and to where they went. The cycle was not only an abstraction in their minds, but could be observed in their immediate and concrete surroundings. The canoes were there, the simple containers where the fish-mongers put the fish for preservation, the bicycles and the baskets where the catch was transported to reach outlying villages, and the waste products were also there for everybody to see, not to mention smell. He could understand it all, not the least because very often he himself was both producer, distributor and consumer.

If we now turn to the cycle from a third perspective, the perspective of exploitation, or uneven accumulation of net benefits, the picture is also well-known: an accumulation in the pockets of the fish-merchants, little elsewhere. The fish-merchants took risks, and they had and have complicated cycles of conversion where the monetary output may be only a minor fraction of the total.⁸ They also occupied key locations in the economic cycle, giving them considerable power. But however that is, there was general agreement - even among fish-merchants - that it was at their portion of the cycle that benefits had a tendency to accumulate.

Thus, the analytical unit of this analysis is the economic cycle, and so far we have come to the very simple conclusion that the traditional cycle was characterized by three properties:

- (1) Ecological balance
- (2) Limited extension
- (3) Uneven accumulation.

In other terms: little depletion and pollution, low level of the type of alienation so typical of modern economies of scale where each single person is just one little element in enormous, world-wide economic cycles that practically speaking nobody understands, and a certain amount of exploitation. A fourth

and highly important feature has been mentioned before: the cycle was low both in production, (total output) and productivity; there was little catch, and very little catch per producer.

In other words, there was a motivation for doing something, and that motivation had two roots: get production up, and exploitation down. One might even say that in the Indo-Norwegian project as it was originally conceived of this very dualism in the motivation was functional in the sense that one could draw upon different types of technical assistance experts from within and without; those with expertise in increasing the production, and those politically inclined to try their hands at decreasing the exploitation. And if one now should formulate the thesis of this article in one sentence it is simply as follows: in their efforts to introduce new economic cycles with increased production and decreased exploitation other aspects of the cycles were to a large extent ignored. Before we try to look more into this, however, there is one little comment. When something is "ignored" people very often want explanations, and these explanations tend to take two different forms. On the one hand there is the idea that there are less than honorable motives behind, that negative effects are intended, and even benefit somebody - to be precise, he who introduced the change. The second explanation goes in the other direction: there were no ulterior motives at all, when something was "ignored" it was simply because of lack of insight, or out of sheer ignorance.

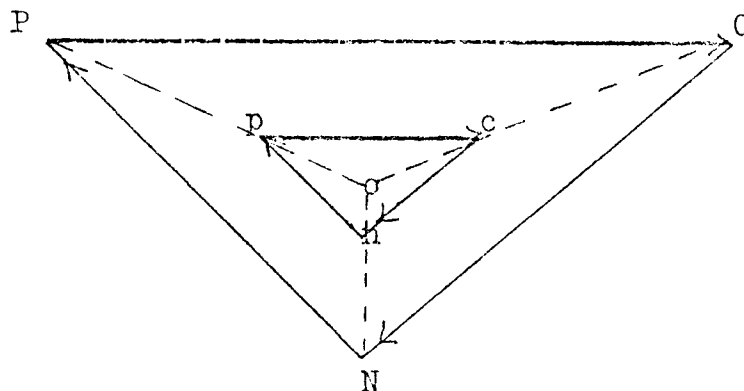
Neither approach is of any interest in this connection, for two reasons. First, we are concerned with the structural aspects of what happens, not with the intentions, the moral integrity, or the intellectual level of those behind a development project. And second, in this particular case, the Indo-Norwegian project located in Kerala, we see no reason at all to throw any doubts, neither on the moral sincerity nor on the level of insight of those who participated in the project. On the contrary, if there is anything to be learnt from this project at all then it may be precisely this: a development pattern may be very different from what one hopes and expects, regardless of intentions and capabilities - simply because

they are inserted into structures so strong, and with a dynamism of their own, that it far exceeds what a handful of good people can muster of defenses.

3. The "blue revolution": from traditional to modern cycles in fisheries.

It is our basic tenet that it is wrong to analyze development projects component by component. There has to be some kind of total analysis, and there are many ways of doing this, whereby a more global impression of what took place can be developed. Thus, here is a one-sentence formulation of what this particular development project was about: an expansion of the economic cycle far beyond the level of the village, to the world level, both where nature, producers and consumers are concerned.

Figure 2. "Development": expansion of economic cycles.



Fishing still consists in harvesting nature, getting its produce; there are still producers, some kind of fishermen who do this, there are still consumers who consume the fish; and there is still waste. So far things can be said to be the same: the modern cycle is isomorphic to the traditional cycle, the same elements can still be recognized; it is merely the famous "economies of scale." But this is a rather superficial similarity, for not much more is similar.

Due to new methods of fishing, the harvesting of nature has been expanded. Thorough research has laid the basis for optimal ocean harvesting, indicating the need to go further out (in the first run ten to twenty miles, later on much further, with real ocean going vessels), and deeper down (hundred to

two hundred fathoms). Nature (N), in short, is no longer to be conceived of immediately, but possibly to be understood through the stories told by the new group of professionally trained fishermen on board the impressive, not only mechanized, but thoroughly modern steel and glass fiber vessels, with electronic fish-finding devices.

Due to the new methods the producers (P) are no longer the traditional fishermen trained through imitation of the older generation, benefitting from all the experience handed down from their ancestors⁸- they are modern fishermen who have gone to courses, and know things never before known, no doubt extremely relevant both to increased production and productivity. For the pattern of modern fishing that was introduced can be summarized in one word: industrial fishing, whereby the fisherman no longer is part of a small team, either as owners or sharing the lot of the canoe - he is an industrial worker.

As to the consumers: they are not the same as before either, and here comes what perhaps is the crux of the story. Briefly told it may be said to have three phases, all of them part of this development project.

In the first phase nature and producers are both expanded in the ways indicated. Fishing is less labor intensive, more capital and research intensive. It is done on an experimental basis, and much of the cost is borne by the Norwegian government under the technical assistance agreement.⁹ One significant part of this agreement is the effort to introduce new methods of marketing, partly to make it more effective in order to expand the cycle, reaching consumers further out, and partly to eliminate the middle-men, the fishmongers. One key element in connection with the expansion, it will be remembered, is the method of preservation. When it comes to methods of preservation beyond simple ice cooling there are many alternatives: the alternative chosen was deep-freezing of the catch duly sorted and prepared, and the preservation of the deepfrozen catch either in freezer, cold storage, or for shorter periods, in boxes, with ice. Instead of the old bicycles transporting baskets with fish,

insulated vans with considerable carrying capacity are introduced.

Although the local fishermen of course still can get for their own consumption what they want, and possibly more easily than before, the difficulty now was that the finished products, fish caught in modern ways and preserved by modern means, simply became too expensive. Consumers were not obtainable at realistic market prices.¹⁰ There was certainly need (for protein) but not demand articulated in the language a market economy will understand: the language of money. Before there was consumption, at a very low level of technology, now there is a high level of technology, but still a very low level of consumption. In short: a rather problematic situation - so what does one do?

In the second phase attempts were introduced to improve the situation. Intuitively there are two ways of doing this: cheaper technology so as to produce cheaper consumer goods, or efforts to find consumers that can pay the price. The second method was the one that was chosen, and there are many reasons for that choice, some of them to be explored later.

One obvious way of doing this is to try to cater to the upper and upper middle-classes of Indian society as target consumers.¹¹ There is no doubt that they have the monetary power; the difficulty is that they do not like fish, or at least did not consume much of it. Another difficulty lies in the circumstance that the fish caught is not very "elegant fish", it is not fish with prestige or snob value.¹²

Efforts were then made to penetrate into the upper classes in Cochin and other places, and demonstrate to the population their willingness to buy and consume fish. The idea was that their life-styles, like most other things, could best be disseminated from the top to the bottom, through the "laws of imitation". However, it can safely be said that this was not a great success, neither at the top, nor at the bottom, nor in between.¹³ The consumption of fish did not greatly expand. And here it might perhaps be added that in a highly inegalitarian society like India it is usually not to be expected that the top and the bottom of society would eat the same food. Food is stratified like people, in vertical societies food is also organized along

a vertical axis. For food to be eaten by the well-to-do it cannot be too cheap; if in addition it should be eaten by the poor it certainly cannot be expensive. One might speculate that there could be a hierarchy of fish: that the top would eat salmon and the bottom herring, so to speak - but then it is not obvious that the bottom will feel inclined to eat herring just by watching and hearing about how the top enjoys salmon.

In short, a modernized technology existed producing a product for which there was insufficient demand to pay for the costs of the technology and in addition render a profit, small or big. What to do?

The solution was simple, and this was the third phase: to concentrate on the part of the catch consisting of shrimps and lobster. These are "elegant seafood" indeed, if not exactly fish; and their price is already high, partly due to scarcity and partly due to demand. The contribution to the total price due to modern technology would be smaller for lobster tails than for more humble fish. In short, there was a basic economic compatibility present that had been seen for a long time: Indians and Japanese had already operated a small export industry based on frozen shrimps and lobster.¹⁴ What happened in the Indo-Norwegian project area was that local entrepreneurs saw the same opportunity, imitated the technology introduced by the Norwegians, and went in for shrimps and lobster. Needless to say, the price of these products was extremely far beyond what the very poor local population could pay, even to the extent that these products became abstract entities, nicely wrapped up with foreign texts, rather than concrete things available for the local population.¹⁵ But years had passed, and the goal was no longer local consumption.

Expensive technology had now produced expensive goods; where were the customers willing to pay the price? The answer was very simple: in the rich countries, or more precisely in Japan and in the US, both countries with enormous demand for sea-food, and particularly for relatively cheap sea-food produced in a country where labor costs are low. Old markets were expanded, new markets were found, and the new consumers (C) were located far beyond the immediate horizon, indeed. They were among the

guests in cocktail parties, eating beautiful snacks, or enjoying shrimp cocktails at expensive restaurants, or among the Japanese consuming an enormous amount of shrimps (particularly big varieties) for their tempura, and among Americans with an almost unlimited demand for lobster. In short, there was no problem finding customers who could back up the demand with money once the product was what they wanted.

And that is, more or less, the story in its simple and basic outline. The cycle has been modernized; not only in the sense that it has indeed been expanded, and integrated into the world economy in general, but also in the sense that all elements in the cycle are "modern". What is caught is caught with the most modern technology, by modern fishermen, marketed with modern techniques to modern consumers. The cycle is of almost unlimited extension, reaching so far and so widely around the world that hardly anyone understands more than a tiny segment of it.

As to exploitation: the leading local entrepreneur in Sakthikulangara, who more than anyone else was able to utilize this resource, built his own ice factory with a capacity of 34 tons of ice, then bought fifteen insulated vans that could bring the product to the harbor of Cochin, and one thousand women to peel the shrimps, and had an annual sales value of thirty million rupees (data from late 1969). His own profit was estimated to four million rupees; some of it given back to the village in the form of a blue and white five-story temple with Virgin Maria on the first floor and Jesus Christ on top, much of it invested in his own house, a palace protected by a high fence and guards with machine guns, and capable of using as much as one million rupees in dowry to have one of his daughters marry into a Brahmin family. Some other families also did well, extremely well by local standards although not equally well. The villages, from having zero motor vehicles suddenly had 25, the price of industrial sites among the palm huts with thatched roofs increased 4.000-5.000% and so on. The GVP (gross village product) per capita no doubt increased steeply, making people talk not only about "economic growth", but even about "little America". Social inequality, in short,

rose tremendously, for most of the population continued as before, and those who were employed in the lobster and shrimp factories were very poorly paid, usually not even with a guaranteed daily income - they worked on an hour to hour basis, depending on incoming catch.

As to depletion and pollution: difficult to say. Relatively soon there was talk about over-harvesting, and lack of seeding, lack of sowing. Since catch had been available for time immemorial with the traditional methods it seems rather likely that highly capital and research intensive techniques would have a depleting effect. And there is little doubt as to the pollution: new smells, new types of wastes, had added to the old ones in "little America".

But production there was, and productivity there was. More fish and other types of sea food were caught and killed than ever before in history, and certainly in more modern ways and by fewer people than ever before. The only difficulty with the whole operation was, again in one simple sentence: the consumption of fish among those who needed this source of protein most did not go up, there are even indications that it went down. Local doctors claim that although the health standard in the area improved considerably in the period the Norwegian health service was operating there, and also in some sectors afterwards because of medical technologies left behind (particularly in connection with childbirth), it was now back to "normal". Since "normal" means malnutrition, among other things, there was no claim that after almost 20 years of joint Indo-Norwegian technical assistance to this area health standards had improved as a result of better nutrition, in turn improved as a result of better supply.¹⁶ And that was, very briefly stated, the purpose of the whole project.

4. Some explanatory factors

The story that has been told above should not be seen merely as a case study relating to a particular area on the Kerala coast. It is far more general in its implications, and when it comes to the factors that contributed to this type of development. These factors we shall now try to look into,

by first asking one question: what are the factors contributing to the expansion of a cycle? And then follows the second question: why is it that such an expanded cycle, although undoubtedly leading to increased production and productivity and to "modernization" does not seem to improve the conditions lower down in society? ¹⁷

One very simple reason why cycles tend to expand when a "development" project is undertaken is that the cycle has to pass through new centers of administration, financing and research, and they are generally not located in the target area. Of course, there is the possibility of utilizing local administrative, finance and research potential. That could also have been done in this case, provided one had been aiming at a considerably more modest goal where "modernization" is concerned. There was local leadership, some local capital (certainly not much), and some local expertise pointing in new directions. But this was not made use of since the whole assumption behind a technical assistance project was that the outsider, in this case the Norwegians, would bring in modern technology. The whole idea of a technical assistance project, as it was conceived of in the 1950's and also today, is anti-thetical to utilization of local expertise. The local population can be used as consultants to pronounce themselves on details in the technology brought in from the outside; it is not the outsiders who are used as consultants concerning new version of local technology. For the basic idea is the introduction of new technology. This is the sine qua non of the entire project: the new technology justifies the experts.

In addition to this comes another factor which also relates to the nature of a technical assistance project, particularly relative to the level of thinking prevalent in the donor country, in casu Norway, some 20 years ago. One was firmly against double standard thinking. What was good for Norwegians was also good for Indians - because only the best was good enough. One should not have a rich man's technology and a poor man's technology. Development was to decrease the gap in the direction of the rich, it was convergence towards the rich and modern.

As a consequence of these two premises the technology exported to the Kerala fishing villages had to be the most modern Norwegian technology at that time. If deep-freezing was the method considered the most developed in Norway in the 1950s, then extremely strong arguments would be needed to put alternative, less "modern" technologies on the political horizon. More importantly: if these alternative technologies, such as drying, cold or warm smoking were technologies that had existed in Norway before and were now considered outmoded or sub-dominant relative to the leading technology, they would not meet the bill. In short, everything was loaded in favor of transplanting "modern" Norwegian research, catching, preservation and marketing technology anno 1950-60 to Kerala.

Similar considerations apply to financing and research. The investment needed to modernize fisheries was of considerable magnitude and could not be obtained locally. They were obtained partly from Norway, partly from the central government, and since this meant that much capital was invested in a small area which was favored by this input it had to be defined as an experiment, not as a gift to that area, nor as a lasting venture. As a matter of fact, there was probably a limit to the amount of success one could have: a lasting total success would be a liability because of the injustice it would cause between the population of those villages and the surrounding millions.¹⁸ An economic cycle that would share the benefits more evenly between the recipients all over the state of Kerala, all over India or all over the world for that matter, would thus have something in favor of it - something alien to the project from a technological point of view, but important from a political angle.

But more important than this was the sheer circumstance that the project was administered by an Indo-Norwegian Standing Committee, with regular meetings, usually in New Delhi.¹⁹ These meetings took place far above the heads of the local population, near to the corridors of power in Oslo and New Delhi, among men with expertise and political insight, communicating in the English language, knowledgeable of many of the same technical details, members of the same world culture - much more similar

to each other than the Norwegian administrator/expert to the fishermen on a peripheral island in northern Norway, not to mention the difference between the Indian administrator/expert and the arava fishermen in Puthentura. That this top level communication process was more easy for the Norwegians than communication with the minds behind the faces looking at them in the village area when they drove in or out of the Norwegian camp with its offices and living quarters, its little tennis court and small gardens; faces pressed against the fences with expressionless eyes, goes without saying. Not only was the local language, malayalam, a very difficult one; the whole pattern of thinking, the cognitive styles, the local culture were incomprehensible to all except at a superficial tourist level, and to the very few who were particularly dedicated.²⁰

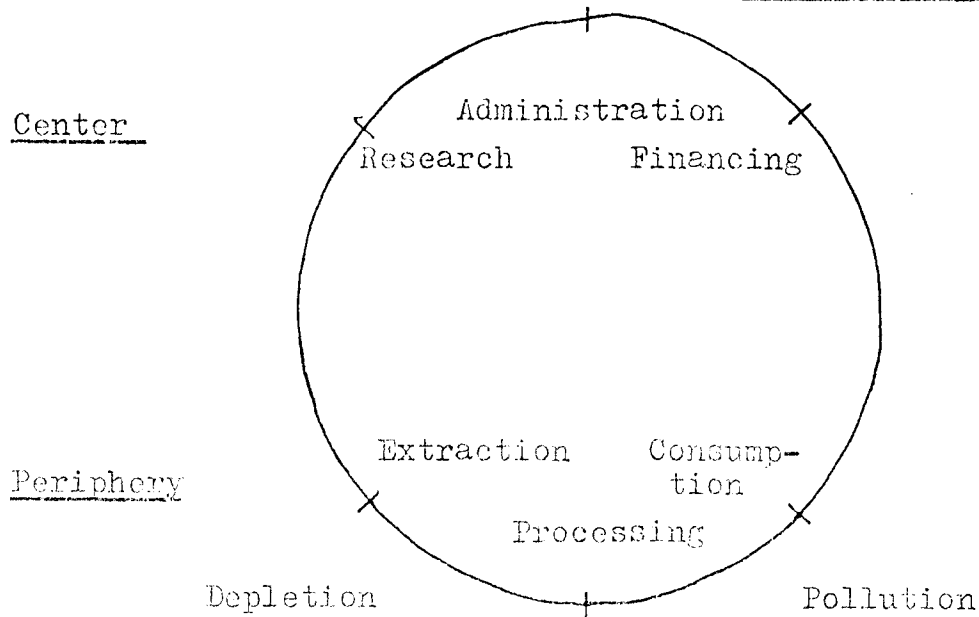
In short: communication took place and real contact developed where it was most easy, and that which was communicated was exactly that which belonged to the modern big cycle rather than to the traditional small one.

When it comes to research there is a similar picture. Modern technology is research intensive; traditional technology is labor extensive in the sense that its expertise is based on dozens, hundreds of generations of accumulated experience, filtered through complex communication processes, and internalized (often implicitly rather than explicitly) in the local producer. Modern technology (e.g. asdic, to locate the shoals) is always new, always recent - or rather: a high proportion of it is new. It is explicit rather than implicit, learnt rather than internalized. And this process emanates from the center, in casu some places in Norway, some places in India, and some other places - it is not locally generated.²¹

In short: if "development" is to be based on "modernization" then it is almost unavoidable that economic cycles are spun in and out of the centers of research in addition to the centers of finance and administration. Very often research, finance and administration are found at the same place, in a private or public corporation.

The net result of all this is a new type of economic cycle that, perhaps, can be illustrated in Figure 3:

Figure 3. A modern division-of-labor economic cycle.



In this economic cycle the focus is on a division of labor between Center and Periphery, with the Center delivering research and technology (know-how and show-how), administration and capital, and the Periphery doing what is indicated in the cycles in Figures 1 and 2, but in a "modern" way. What this division of labor means is that the tremendous experience gained through trial and error, through doing the research, including the practical experiments, not only knowing the results, is given to the Center; that the corresponding experience and control relating to administration and finance are also kept by the Center - and that the Periphery receives solutions, decisions, and investment (loans/grants). The Center grows with this process, develops an experience that can be used in other projects, and in other parts of the world, and not necessarily in a technical assistance context. The Periphery also gains something in principle: a modern technology is introduced, production and productivity go up. But then there are the negative sides to the equation.

First, a pattern of dependency is in all probability created. The Center will continue doing research, and stimulate

a demand for the most recent technology. The Center will also develop new administrative frameworks, for instance multilateral, international organizations, and stimulate a demand for participation in these organizations by offering information and decisions that high level representatives of the Periphery country's own people have participated in formulating. And the Center may put at the disposal more capital, for expansion of the technology introduced, or for introduction of even more modern technology. This dependency pattern is relatively clear: only Periphery countries with very clear goals and strategies of their own will be able to resist this. The strength of the Center is always in part based on the weakness of the Periphery.²²

It may be objected that it is not necessarily so: the Periphery may gain independence by defining a cut-off point, saying "we now have what we need, and can take off in our own direction". In the Indian case this was to a large extent true: at an early stage it was made completely clear that research, administration and financing should go entirely over to Indian hands, after some time.²³ But these Indian hands were not located in Sakthikulangare/Puthentura, but in the Indian centers of administration, finance and research - for instance New Delhi, Bombay and Hyderabad/Bangalore etc. In other words, relative to the local poor fishermen, unless very nationalistically inclined, there was probably scant comfort in knowing that the high spheres of the cycle to which he belonged passed through Indian rather than European centers. To those placed in the center of Indian society this made all the difference.

It is clear from what we have said that the economic cycle induced by the Norwegian project was both alienating and exploitative; alienating because of its enormous extension, exploitative because the Center gains so much more than the Periphery. The Center benefits from having the most challenging tasks, that of implementing and developing new technologies; and the local center, the local entrepreneurs, were able to extract considerable profit to themselves. And in addition to this, since extraction, processing and also some of the consumption are placed in the Periphery most of the depletion and the pollution will also take place there. Concretely, that means that a high portion of the total costs of running the process have been dislocated towards

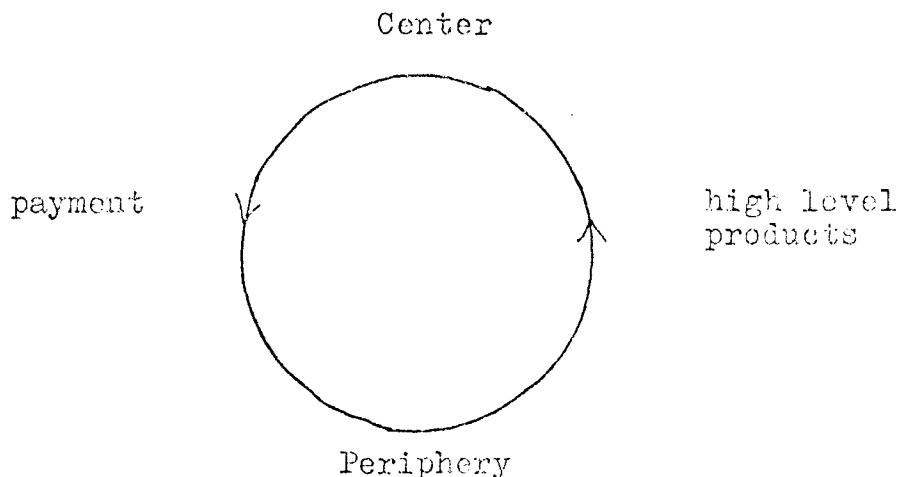
the Periphery - as indicated in Figure 3.

But, it will immediately be objected: frozen shrimp and lobster did not simply disappear, there was payment in return for it, and even much of it! Potentially, this payment might even be used to buy in highly concentrated form protein that could be distributed to the masses in those villages.

Needless to say, nothing of that kind happened, although the idea looks nice on paper. What happened instead is complicated to understand and even more complicated to demonstrate. But even the most elementary knowledge of economic cycles will give us some leads.

The payment in Figure 4 can be split into many components.

Figure 4. The Center-Periphery export-import cycle



What happens to this payment? Obviously, a certain proportion will always go to (or be retained by) the Center to pay for their services, for knowhow (patents), for administration and financing (servicing loans).

Then, there is the proportion that goes into maintenance and modernization, also to the Center, of the world, or of India. By Indian regulations hard currency earning export industries may decide over a certain proportion of the currency earned provided it is used to cover this type of expenses.²⁴ To some extent this may be said to reinforce a dependency pattern since the exporter will probably be highly motivated to control himself how the money is put to use. But it must always be remembered:

investment in increasingly modern machinery does not itself, directly, mean satisfaction of basic human needs. The extent to which it has this implication depends on other factors.

Third, with export markets found in hard currency regions chances are extremely high that the currency will be used to procure capital goods needed for industrialization and for military purposes elsewhere in the Indian subcontinent. Chances are not high that it will be used to buy foodstuffs, for instance. Those who articulate the need for capital goods near the power centers speak with a considerably louder and more articulate voice than those who suffer from malnutrition in the backwaters of Kerala. The ideology of "industrial growth today, benefits for everybody tomorrow" will sound as obvious to the center as meaningless to the periphery. Moreover, the technical assistance project was for India as a whole, the hard currency is gained for India and received centrally, not for Sakthikulangara/Puthentura. For that reason, even if it should be used for foodstuffs, higher priorities might be given to more hunger-struck areas than these villages.²⁵ Generally speaking, however, the hard currency will be spent according to centrally articulated demands, and what is left after taxes will be made available locally, in local currency.

The fourth portion may be identified with profits. Of these profits some may be kept abroad under a gentleman's agreement between the Indian exporter and the foreign importer - it is not too complicated to make up accounts in such a way that there will be a balance kept in a foreign bank account to be drawn on during business/pleasure trips. The major part of the profit, however, is probably taken home - and we have already given a description of ways in which it can be expended.²⁶

It may now be objected that this is an unnecessarily dark picture, and that it could be changed basically if the local entrepreneur were not that able to extract profits, and if India were much more decentralized when it comes to deciding over the proceeds from hard currency earning industries. Unfortunately, the matter is not necessarily that simple.

First, when it comes to the local entrepreneur, he is

certainly a point of accumulation of benefits in the total cycle, but since this is a world-wide cycle his benefits are small relative to the total accumulation in the cycle. Measured in terms of the income inequality produced inside that village by the new cycle it looks atrocious, and possibly so much so that it sooner or later may contribute to a revolution which is not blue. But that does not mean that there is much to gain for the masses if the profits are spread thin. A nationalized industry in this field would not necessarily have the same profits - at this point the Kerala Fisheries Corporation (the "integrated fisheries projects" taken over by the Kerala government after the Norwegians left their trial factories etc.) gives some negative indications. However, for the sake of argument we assume that a nationalized industry would have the same profit-making capacity.

It is more difficult to imagine that the surplus value for that reason would go back to the masses. One simple reason is that the masses no longer participate in producing the profits: labor has become specialized, the new fishermen are located somewhere between the industrial proletariat and industrial professionals, they are few in number and to share the profits with them would be good for them, but not reach very far.²⁷ Of course, there are welfare state measures that might be introduced, and that would be meaningful - but again the problem is whether those two villages would necessarily be given top priority.

And all the other factors would remain the same: the technology would still be dependent, it would still have to be paid for, maintenance and new investments would still enter the equation, and so on. Even if we assume a distribution structure so that central military and industrial needs would be given low priority it is far from obvious that the poor villagers themselves would have their situation basically improved. The product would still be too expensive to consume, they would still have to fish for personal consumption with the old methods, or with the old methods slightly improved, they would still do so in the demoralizing shadow of the glittering affluence of the modern ocean-going vessels, ice factories,

insulated vans, etc. for their eyes.²⁸ And they would, as they do today, constitute typical examples of dual societies and dual economies, where one of their major tasks would be to bridge these dual economies by being a labor reserve to be drawn upon for shrimp peeling purposes when the catch is particularly good.²⁹

5. An alternative model.

We would characterize this development project as a bad project, regardless of the circumstance that a modern technology has been transmitted to certain segments of the Indian structure, and regardless of the circumstance that fewer people make more catches in a more modern way than at any time before in Indian history. The purpose of a project of this kind cannot be to kill more fish, it must be to improve more human lives. We have indicated above some reasons why the former does not at all necessarily lead to the latter - social and economic structures are stronger and much more complicated than facile conclusions of that kind should indicate.

The question now remains: can we make use of this type of thinking to derive some ideas about alternative models, which would mean ideas about alternative development strategies? If not, the model is no good: the focus of interest is not to explain what has happened, but to indicate new possibilities. We think it is possible, and here is one set of strategy implications.

The point of departure has already been mentioned but could be made more explicit: to avoid economic cycles with ecological imbalance, uneven accumulation (exploitation) and unlimited extension (alienation). This is a negative formulation and it should be complemented with a positive definition of development: development is here defined as a process that leads to, as a minimum, the satisfaction of elementary needs (food, clothes, shelter, health, education) for all members of society; is compatible with a high level of local autonomy in goal-setting as well as instrumentation, and to a reasonable level of equity and ecological balance. Nothing of this contradicts the idea of increased production and increased productivity, but if there

should be an incompatibility somewhere then "technical efficiency" would have lower priority. Thus, the goal is not in terms of production and productivity, but in the terms just mentioned.

It follows from this that the new technology to be introduced cannot be too research and capital intensive. "Industrial fishing" as it is conceived of today does not in and by itself constitute a solution to the problem of the poor fisherman.³⁰ From this it does not follow that a traditional economic cycle constitutes a solution either, hence the search for an intermediate economic cycle. This is a broader idea than the search for an intermediate technology, and it is very much doubted that one has to be an expert on fisheries in the "modern" sense in order to see some of the outlines of an intermediate cycle, including an intermediate technology.³¹

In fact, the whole concept of an expert is precisely what is at stake in this connection. We have argued above that the expert may be directly dangerous - except to those who are placed on the sunny side of that cycle (including himself - the salaries he received were quite handsome). In fact, it may well be that if Norway had used her deep-freezing technology not on fish but on experts fifty, even 100 years ago, so as to benefit directly from their advice (upon thawing) concerning the intermediate economic cycles they knew personally it might have been more beneficial. It might also well be that for each expert sent abroad to modernize and industrialize there should be at least one anti-expert seriously conveying concepts of de-industrialization and de-modernization - to make for some kind of balance.³²

Any intermediate technology would have to be judged not only by its ability to satisfy the needs of the periphery, but also to be directed by the periphery. This in itself points in the direction of beach fishing rather than ocean fishing. On the other hand, if some simple type of mechanized craft is wanted then the intermediate economic cycle would at least have to be stretched in the direction of a factory capable of producing cheap and simple inboard or outboard motors. In a world which has not yet (with the exception of the People's Republic of China)³³ started asking fundamental questions about the total economic cycle, the factors taken into account in a

cost-benefit analysis would be limited in number and scope.

The idea of intermediate cycles would force one to ask whether new types of engines, possibly based on new sources of energy, could be invented so that they could be produced within an area with a population of, say, 50-100,000 rather than in an area with a population in the millions to support the factory and the research. In other words, a fundamental question will always be: can it be produced locally? - meaning neither "village", nor "country" but something in between. That technology does not exist today, for which reason one might have to concede the necessity of involving industrialized centers in southern India outside the extended project area. This, however, would still be closer to the traditional cycle than to the modern cycle in Figure 2, hence not too objectionable.

When it comes to the crucial point of preservation of the catch it seems obvious that less capital intensive methods have to be found. Drying and smoking are perhaps the two most obvious methods, but others also exist such as more use of ice rather than freezing.³⁴ It is surprising that so little was done to look into these possibilities, and that can probably best be explained by the built-in need to export "modern" technology. It is quite possible that such "intermediate" methods would have negative effects both in terms of depletion and pollution: trees might have to be cut excessively to produce the wood needed for the heat and the smoke, and this would in itself lead to pollution. But then it might be that other sources could have been found, such as solar energy, tapped directly and not via all kinds of indirect storage - a tremendously rich field, virtually untapped.

At this point it may be objected that research in this field is not very likely to take place in these villages; in fact, it will probably rather take place in the Center. This may be true in our presently distorted world, but if the result is a technology that would make sunny districts in the Periphery (and there are many of them!) autonomous where energy is concerned, in a way that can neither be depleted nor lead to

significant pollution, this would be a minor consideration. Again, that technology is not with us today, so what we are saying here is the usual plea for a redirection of technological research. But smoking and drying based on intermediate technologies already existing were both well within the capacities of the area in which the project took place. If it had been implemented one might have obtained a high number of small sized and medium sized enterprises for the processing of fish, not a small number of giant ones as created today by the modern technology. This would not guarantee strict equality, but would rule out the crude exploitation found in the present system.

Then, the problem of marketing. An economic cycle would not dissipate into the unknown if a population in the magnitude of 10^5 , perhaps even 10^6 (rather than the figures encompassed by the traditional cycle, 10^3 and 10^4 , or by the modern cycle 10^7 and 10^8) were enclosed within its perimeters - which of course does not mean that all of them would eat the fish caught by these two villages. These would be examples of intermediate size markets, and to cover those when drying and smoking are used for preservation extremely expensive insulated vans would have been neither necessary, nor desirable. With the old bicycle method the bicycle could go much further than the fish; the fish started rotting before the bicycle got stuck in the mud or the cyclist got exhausted. Scooters also offer possibilities, and who is to rule out the possibility that the same engine could be used for boats and scooters.

At this point we choose to stop, well knowing that all elements in this range of alternative models are highly debateable, from the point of view of whether they are viability as well as attainability. No doubt, other types of alternative models could also be imagined, within the constraints set by the requirements laid down in this article concerning economic cycles. This applies a fortiori to the problem of social organizations: should it be private enterprise, state corporation or a cooperative? In the latter case, should it be unipurpose or multipurpose? 35

6. Conclusion

However, we shall not even attempt to discuss these problems, for they are outside the scope of the present article. What we have tried to do is to indicate a set of criteria for the steering and the evaluation of development projects, all of them within a framework of thinking defined by an analysis of the economic cycles being used by the project. In so doing the conclusions arrived at concerning this particular Indo-Norwegian project are far from positive. However, that conclusion is of minor significance relative to the basic problem of designing and implementing different types of cycles with better ecological balance, less exploitation and less alienation. For although the "modern" cycles described above are still increasing in scope and number and depth the awareness of their tremendous shortcomings seems to be mounting. And this article is one little contribution, however small, to the increase of that awareness.

N O T E S

* This paper is the outcome of field trips to the Indo-Norwegian project area in Kerala in December 1960, June 1962 and December 1969, and countless talks and discussions with informants who have been involved in this project one way or the other, Indians and Norwegians. I am particularly grateful to two of the former directors of the project, G.M. Gerhardsen and Diderich Lund, and to my old colleague in this research project, Arne M. Klausen - but the responsibility for the conclusions drawn rests with the author alone.

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1. There is a certain perspective on economic theory underlying this presentation; and for more details on this perspective see Johan Galtung, Economics and Peace Research (mimeo 1974).
2. For some literature in English on the project, see Per Sandven, The Indo-Norwegian Project in Kerala, Oslo 1959; Arne Martin Klausen, "Technical Assistance and Social Conflict: A Case Study from the Indo-Norwegian Fishing Project in Kerala, South India", Journal of Peace Research, 1964, pp. 5 ff. and his Kerala Fishermen and the Indo-Norwegian Pilot Project, Universitetsforlaget, Oslo, 1968.
3. The most important evaluation report so far seems to be T.R.Thankappan Asari, "The Impact of the Indo-Norwegian Project on the Growth and Development of Indian Fisheries", presented at the FAO International Conference on Investment in Fisheries, Roma, 18-24 September 1969. An analysis of this report will be given in footnote 17 below. The report has also been published in Norwegian by NORAD (the Norwegian Agency for International Development) under the title "Det indisk-norske fiskeriprojektets betydning for vekst og utvikling av Indias fiskerinæring".
4. In the "First supplement to the agreement between the United Nations, the Government of Norway and the Government of India concerning economic development", signed 24 January 1953, there is a description of the project where it is stated: The purpose of the project is to bring about: -
 - a) an increase in the return of fishermen's activity,
 - b) an efficient distribution of fresh fish and improvement of fish products,
 - c) an improvement of the health and sanitary conditions of the fishing population, and
 - d) in general, a higher standard of living for the community in the project area.
5. If we look at the four purposes of the project the latter two have an immediate and direct bearing on "standard of living", in other words on the more ultimate goal. The first two can be seen as more instrumental, particularly when "increase in the return" is interpreted more in terms in increase of catch than

increased cash. We shall see, however, that the evaluation tends to be in terms of the first two rather than the second two, in terms of means rather than ends, and also in terms of lower order means such as statistics on the type of equipment used, etc. in other words, there is a tendency for evaluation to be gliding from goals towards higher order means and then towards lower order means.

6. Mathew Philip, in his A Fishing Village in Kerala (for post-graduate diploma in town and country planning, School of Planning and Architecture, New Delhi August 1966) gives some interesting background data on the significance, for India, of Kerala fisheries. Thus Kerala had 256 marine fishing villages stretched over a coastal length of 360 miles, and they alone contributed to slightly more than 25% of the catch landed in India.

7. "Before the mechanization the fishermen used the same fishing methods as their forefathers had done for generations. The fish are sold in piecemeal and sprinkled with sand to retard the decomposition process, and no ice was available" (Philip p. 110). As late as 1952 there was actually no mechanized fishing in India, in 1971 there were 4-500 vessels (Dept. of Agriculture).

8. The by far best anthropological study of the area is Arne Martin Klausen, op.cit., particularly pp. 75-85, 113-118.

9. The total cost borne by the Norwegian government was about 120 million Norwegian Kroner. Being one of the first projects of its kind, with no prestigious models to imitate, this was a considerable sum and an audacious venture. The costs were more than double any other development project when it was completed after 19 years.

10. Of course, fish caught and marketed in the old way was still available at realistic market prices; the traditional cycle continued. For local purposes the old preservation method based on sprinkling with sand, with elements of drying and salting and ice, were not discontinued. According to information obtained in the Department of Agriculture in New Dehli March 1971 fish prices went up 200 to 300 % in 1-2 years - as a result of the changed situation. It is difficult to ascertain, however, to what extent there are two parallel markets also where prices are concerned, one corresponding to the traditional and one to the modern cycle.

11. This was actually done in Cochin, and should be seen as compatible with the general liberal approach to "development": betting on the strong. The general approach is to start from the top and hope for a trickling-down effect; what is interesting is that this also applies to the consumption part of the economic cycle. The model, however, presupposes a more continuous society where strata are to some extent imitating each other, not oil-and-water-type societies where patterns at the top often are seen as irrelevant to those lower down.

12. According to information obtained in the Department of Agriculture there are about 500 varieties of fish in the Indian waters, out of which 20-35 are marketable. Indians eat fresh fish, for export the small varieties are canned and the big varieties are frozen. In addition to that there was a long tradition of exporting dried shrimps and sharkfins, for instance to Burma and to China, even from the project area.

13. The usual tendency among foreign experts was to blame this on a general failure of Indians to eat fish. There may be some truth to this, particularly because of the way fish looks from a Hindu point of view (killing has been involved, low status people have been engaged). But even though fish is not eaten in great quantities as in Norway, but more as a taste ingredient added to rice, explanations should probably rather be found in economic than in anthropological terms. The basic cause for the failure of fish consumption to expand was the failure of prices to go down or the buying power of those most in need of more food to go up, according to all the informants in the area in 1969.

14. This industry was of a fairly recent origin though, dating from the 1940's.

15. The change from the 1950's and early 1960's till the late 1960's was almost incredible. The Norwegians had constructed the model items, the icefactory and the cool storage - all that had been given to the Government of Kerala and was run under the name of Kerala Fisheries Corporation. Only around 50 persons were employed and this enterprise was of little significance relative to what private initiative had brought about. Again, on the Hindu side of the Neendakara bridge between the two communities very little had happened except for the Goodwill Ice Factory with 10-12 employees. But on the Catholic side the result was almost incredible:

- Oceanic-Asiatic Sea Product, with close to 1000 employees (most of them very much parttime, however) and about 30 million rupees in annual sales;
- Kerala Sea Foods with about 400 employees, 10 million rupees sales;
- Esmario Export Enterprise, with 200 employees
- Indian Aquatic Product, with 75 employees, and so on.

These enterprises were themselves the owners of boats and gear, and bought from the fishermen regardless of what boats and methods they had been using - fish is fish. They had their own ice factories (the biggest one with a capacity of 34 tons of ice), but concentrated on the 20% of the catch consisting of shrimps and lobster. The lobster tails were detached from the rest of the body which was thrown overboard, very many women were ready to wash and rinse and pack, then it was deepfrozen and in boxes and parcels, sent in big isolated vans (the two biggest enterprises mentioned above had 15 and 6 of those) to Cochin to be shipped to the US and to Japan.

As an indication of what that means a quotation from Thankappan (p. 21): "the small area of Sakthikulangara and Neendakara developed by the Indo-Norwegian Project and followed up vigorously by the private entrepreneurs in the area accounted for an export earning of Rs. 39 million in 1968 which was about 20% of the All-India export earnings from sea-food products". Of course, this may also be read as an indicator of how undeveloped other parts of the Indian coast were. For a general, very positive account, see "Phenomenal Growth of Kerala Fishery, Pioneering Role of INP",

The Economic Times, 21/4, 1971.

16. There is no doubt that the local population improved considerably physically from mal- and undernutrition during the early years of the project. However, the impression from talks with the local health personnel after the extensive health program had been discontinued was that this improvement had been more due to excellent health facilities and had disappeared with them; that they had not come by as a result of improved living condition, and at any rate were not really rooted in any new local structure. An exception would be the excellent water supply for 120,000 persons through the 27 kms pipe-line from Sasthankotta lake.

17. Our statement that the conditions lower down in society did not really improve due to the impact of the project is based on local observation and information and not on hard data. This perspective is not reflected in the various types of evaluations given of the project. Thus, Philip mentions as the major impacts of the INP, comparing Sakthikulangara with a non-project fishing village, Tekkumbagam: an average increase in catch of 40% for small boats; the possibility of converting money into social status; more complex use of land - for industrial, commercial, public use; new forms of transportation; new sales organizations; average size of housing up from 250 to 400 square feet; 70% increase in the number of houses that are owned; maximum 200 meters distance to drinking water. All this is correct (the figures vary with method of calculation) - but refers to averages, not to those lower down.

This point is particularly conspicuous in the most serious evaluation of the project, that undertaken by Thankappan. In his section 6, "Impact" he first discusses "Development of new fisheries" and mentions the possibility of fishing in new regions, during new seasons of the year and deeper down in the waters. Like his second point, "Mechanised fishing assumed growing importance" this is clearly a means rather than a goal. He demonstrates how the number of traditional crafts declined from 493 in 1953 to 228 in 1963, and down to less than 100 in 1968. In the period from 1953 to 1968 the percentage of the annual sea fish landings in Neendakara caught by mechanised boats increased from zero to 93,7%. In this period the total catch went from 200,000 tons, to 1,280,000 tons; an increase of more than six times. In other words: More fish was caught and in a more modern way than ever before.

It is when Thankappan comes to his third point that he touches on the goals: "General standard of living of fishermen improved". This section is, however, only about 5% of the total dealing with the impact. It refers to average increase in income (68% over 10 years), to a decline in indebtedness (36% over 10 years) and to a decline in the consumer expenditure of food (from 75% in 1953 to 67% in 1963). The latter are still very high figures, in fact higher than the 60% reported "for all households in the State". Nevertheless, there is no doubt that the crew members of mechanised boats made a much better living than crew members of traditional crafts (annual net income per crew member being about 2 to 3 times higher). Nor is there any doubt that their status in the community

increased appreciably precisely because they were located on a modern cycle of economic activity. And the total employment in fishing and fish-processing went up from 2.100 in 1953 to 5.800 in 1968. Out of these 1.600 were engaged in peeling making not more than $2\frac{1}{2}$ to $3\frac{1}{2}$ rupees per day. More importantly, however, according to all local accounts the difference among the fishermen - never reported in the evaluation report - not to mention among all those engaged in the fishing industry from the top entrepreneurs down, was tremendous. Averages deceive; the immediate visual impression and local accounts about how some people became fabulously rich and other stayed more or less the same give a much more correct impression.

Thankappan then proceeds to "Greater dispersion in the ownership of fishing capital", and mentions that an entrepreneurial group has emerged so that the percentage of "fishing labour" (not owning the boats on which they work) decreased from 76,5% to 65,1% from 1953 till 1963. But this cannot possibly be considered a goal unless one subscribes to an ideology of free enterprise. At any rate, it is certainly not among the originally stated goals.

His fifth point, however, "Foreign trade boosted up" can be said to belong to that category. As mentioned it amounted to 39 million Rs. in 1968, out of which slightly above 35 million Rs. were made by the private sector (in other words not by the Kerala Fisheries Corporation). Again the same point, not only has more fish been caught, and killed - it has also been marketed, even abroad: but did it really significantly help, say, the lower third of even half of the total population?

And the same applies to his sixth point: "Industrialisation quickened". Capital is coming in (at the end of 1968 the total investment in the area was 12,5 million Rs.), but that in and by itself does not prove anything. Once more, much detail about the means, very little about the goals.

To this it may be objected that we are here dealing with a case of the fallacy of statisticians: they deal with that about which they have data. This is not true, however, since it would have been very easy to present data about dispersions, disparities, inequalities. But what about the politicians in New Delhi, what do they have to say about the Indo-Norwegian Project?

It is interesting to note that in the Estimates Committee Report on the Indo-Norwegian Project, Ernakulam (Lok Sabha Secretariat, New Delhi, 1968) 24 recommendations are made. Some of them are critical of the Norwegians ("frequent changes in the technical personnel, and especially of the director" have /had/ a deleterious effect on the smooth and efficient functioning of the institution"; "about a third of the expenditure on the Norwegian side has been incurred on the salaries and allowances of the Norwegians since the inception of the Indo-Norwegian Project"; "performance of some of these vessels has not been very satisfactory and the repairs costs on them have been quite heavy"; "decommissioned as soon as they arrived here owing to dry rot"; "some of the Project's vessels have not been adequately and properly manned, with the result that the fishing operations have been adversely affected") - but there is no mention at all of the impact or lack of impact on the living conditions of the population (except that "it would have been desirable to set apart specific sums for improvement of housing conditions, drinking water, education, transport etc. of the fishermen of the area so as to bring about an improvement in their social and economic condition" and that

"a detailed study may be undertaken by the Ministry with a view to see to what extent the objectives laid down in various Agreements have been achieved". Nor is there any mention of such social goals as social equality, autonomy, self-sufficiency - where - as there is very much emphasis on export. In other words, the general perspective taken is a center, not a periphery perspective.

18. This was to some extent the problem with the project as evidenced by the fact that some people tried to smuggle their family members and others into the area in order to benefit from the various types of services.

19. The Standing Committee had a fair composition in terms of distribution between Indians and Norwegians, between New Delhi and the States - but what was completely missing was any kind of representation of the population in the project area. Of course, there were also meetings at a local level with representatives from the co-operatives, but these meetings were not concerned with fundamental decisionmaking.

20. When the present author himself lived in the villages (summer 1962) the Norwegian personnel with the exception of those working in the health sector) practically speaking never went outside the project camp except in cars.

21. Of course, it should be pointed out that this does not only apply to this project - it is a rather world wide phenomenon.

22. Example: Eastern Europe vs. Western Europe. One source of weakness in this particular Periphery was the division inside the project area in the two communities, one hindu and one catholic, and one might add the standard divisions of the hindu community into "communities" - a euphemism for caste. Another lies in the circumstance that modern technology is more international, traditional technology more local.

23. Thus, it should be emphasized, though, that although the new cycle brings with it a certain technological dependence it is not an imperialistic cycle. For the cycle to be imperialistic a much higher level of harmony of interest between the Norwegian and the Indian elites would have to be present. Thus, the typical imperialistic cycle would include such elements as Indo-Norwegian joint enterprises, use of Norwegian machinery at all points, use of Norwegian ships for transportation of capital goods and (slightly processed) seafood, and repatriation of profits. These factors are not present - the center-center cooperation was at a much more technical and administrative level. The economic accumulation was at points in India; but the research spin-offs also came to Norway. The transfer to Indian authorities took place 1. April 1972 and included also the project in Cannanore (Kerala), Karwar (Mysore) and Mandapam (Tamil Nadu).

24. All foreign currency earnings had to be declared; those working in the fishing industry were not licensed to import directly.

25. Such areas are indeed common enough in India and the argument that priority should be given to them would carry considerable weight. On the other hand, that does not help the poorest of the poor in these particular villages.

26. In addition to this could be added the very high level of consumption displayed by the entrepreneurial caste in the area, particularly when it comes to housing. The contrast between their level of living and the general population is completely unreflected in any official evaluation of the project.

27. One would expect relatively quickly the percentage of people actively engaged in fishing to dwindle because of the high productivity, assuming that production cannot continue to increase indefinitely, partly because of saturation of markets, partly because of depletion of resources. Of course the internal market is almost inexhaustible, but that is a market of need rather than of demand, articulated in money. From the fact that the fish-producers make a better living cannot be deduced that the fish-consumers do better - for the simple reason that the prices of fish go up. And there are considerably more (fish) consumers than there are fishermen.

28. As to the dwindling traditional sector it makes much sense to ask: who left it, and who stayed behind? Obviously those who left the traditional sector and jumped on the modern economic cycle were those who were most favoured to begin with, those with a little capital, good connections, energy, youth and possibly also some schooling. In addition to that the INP had brought important resources into the picture to facilitate this kind of transition, such as training schools in India and also project fellowships to study various aspects of Norwegian fisheries (more for the administrative personnel, however).

29. The basic point is the way in which payment depends on catch: no catch, no work; no work, no pay. As for early 1974 this is also the case for similar work in Norway, with her relatively strong trade unions, and the employees are, of course, usually women - with the rationalization that they can go home and do some house-work in-between.

30. Of course, as long as a small area like the project area accounts for as much as 20% of the export earnings many people can be drawn into it. But that is not the lasting condition, and because of all the forces that will push in the direction of higher productivity, increasing the production, but at the expense of the number of people employed.

31. The basic book about intermediate technology is E.F. Schumacher, Small is Beautiful, London, Blond & Briggs, 1973.

32. Preferably that anti-expert should come from the local population in order not to make the target areas for technical aid projects or development projects of the various kinds into battlefields among contending factions in "developed" countries.

33. For some ideas about current Chinese policies in terms of economic cycle analysis, see Johan Galtung and Fumiko Nishimura, Learning from the Chinese, Oslo, 1974, mimeo.

34. As mentioned in the text, this was actually one of the traditional methods in the area. As to smoking: the local wood seemed to leave a bad smell, which might be an argument for growing new types of trees.

35. These terms are taken from Indian terminology, and refer to cooperatives designed for a specific purpose (e.g. marketing of fish) vs. cooperatives with a much more diffuse purpose, including general satisfaction of social and political needs. The answer is usually in terms of both - and rather than either-or.