

chase price of paddy in Morazha In March 1955 of 3 annas 4 pies per lb, his net income from paddy lands would thus be Rs 3,750 per year, or slightly over Rs 300 per month.

Income from Fishing Rights

He derives, besides this, income from lands in another village, and from another source as well. The Kaipad lands, during flood periods, teem with fish, which together with toddy, were formerly the staple diet of most of the villagers. Two years ago (1953) the above-mentioned intermediary, who holds on lease most of the Kaipad lands in the village, leased for a 5-year period fishing rights over these lands, which were hitherto free to all villagers during flood seasons, to a Syrian Christian from Cochin on

payment of Rs 5000. This Syrian Christian has made a substantial capital investment in sluices, certain improvements in one of the dams, nets and drying arrangements and is now exporting most of the fish which was formerly an important component of the local diet

Rents from Cultivating Tenants

Table IV is based on direct enquiries into rents paid by cultivating tenants for leases of paddy lands held under this intermediary. The 12 statements included in the table were carefully checked and were the most reliable that could be obtained. All of the leases in the table are of Kaipad land. Cost of cultivation was computed at a uniform rate based upon local en-

quiries; labour charges per acre for all operations were on an average 47 man-days at 3 lbs of paddy per day, and 40 man-days at 1½ lb of paddy per day, or a total of about 200 lb of paddy; seed rates were 1/3 the usual rate prevailing in the village of 100 lb per acre. Four of the 12 cultivators paid virtually their entire surplus as rent. In no case did rents conform to the rate laid down for Kaipad lands in the Malabar Tenancy Act of 1954, S. 6 (25 per cent of the gross produce)! Rents for this category of land were on the whole lower than rents prevailing generally, as reference to Table VII will show. This is, however, explained by the greater risk involved in this type of cultivation.

(To be continued)

Export of Electric Power from Yugoslavia

(Contributed)

ELECTRIC power as an export product has been a special concern of the Economic Commission for Europe. The subject has been touched upon in many of its publications but mostly in passing. Some sale of electric power across the national frontiers takes place in Europe even now; thus in 1951, total exports of electricity formed 1.6 per cent of total production as compared with 1.4 per cent in 1950. But this international trade has so far been in the nature of an exchange between hydro and thermal power. Schemes for expanding international trade in electric power are no longer a novelty. The proposal for laying transmission cables across the English channel for connecting the grid systems of Britain and France has been in the air for sometime. The scope of international trade in power, as in other things, rests on mutual advantage and depends largely on the seasonal variations in demand and supply. To the extent that natural conditions influence the latter in a favourable direction, there is scope for profitable trade. If two countries do not have peak demands at the same time and in addition, supply conditions also differ, one country may be in a position to spare power just when the other passes through its peak demand and also experiences, because of the freezing of its water-supply for its hydro-electric stations, for example, a decline in its power supply.

Export Prospects Unique In Europe

In this respect, the prospects of

exporting electric power from Yugoslavia are perhaps unique in Europe and it is not surprising that they should be studied by the E C E. The Committee of the E C E on Electric Power appointed a group of experts for making this study on a request by the countries which are most likely to benefit from the export of power from Yugoslavia. This inter-governmental body, known as Yugelexport, carried on its study of the technical, economic, financial and legal aspects of the project during 1954. The final text of the study was approved by the liaison Group of the Committee on Electric Power at its meeting in Geneva on December 14, 1954. This is now a priority project.

The decision on it was taken by the Committee on Economic Power at its seventh session, confirmed at its tenth session and amplified at its twelfth session. The resolution adopted at the last session of the Commission reads as follows:

"Now that the technical, economic, financial and legal study of the prospects of exporting electric power from Yugoslavia has been approved, establishment at the inter-governmental level of a Co-ordination Committee consisting of two representatives each of Austria, the Western zone of Germany, Italy and Yugoslavia was agreed, with the following terms of reference:

"To study, in the light of developments in the situation, the various arrangements which might be con-

templated for the execution of the scheme;

"To facilitate the negotiation of inter-governmental agreements to match the bilateral contracts concluded between the undertakings of the countries concerned; and

"Generally, to co-ordinate the study and execution of the several stages";

Yugelexport Study

The Yugelexport study, it may be noted, was not only taken up by the United Nations Economic Commission for Europe on its own; it had been drawn up jointly by experts of the Governments of Austria, Germany, Italy and Yugoslavia, countries which have a vital interest in the success of the project. For two full years, these experts had been successfully co-operating on a relatively complicated task, elaborating not only the technical side, but also the economic, financial and organisational — legal aspects of exporting electric power from Yugoslavia.

The study has established:

(a) That export of considerable quantities of electric power from Yugoslavia is technically possible;

(b) That such export could go on for decades; and

(c) That the export of power will not only benefit Yugoslavia, but will also help the economic development of the neighbouring states which purchase winter current from Yugoslavia.

The study goes into details and

is well illustrated graphically. Its thoroughness is guaranteed by the authority of both the Governmental experts, who are responsible for its contents, and of prominent technicians from United Nations Technical Assistance Programme, who solved the necessary geological construction and electro-technical problems. It was fortunate that these Technical Assistance technicians were from the countries which will in the future buy electric power (Italy, Western Germany, and Austria), for their positive conclusions make the study even more convincing.

Market Value of Power

The Yugelexport study consists of an introductory chapter and four sections economic, technical, financial and organisational-legal. The economic section deals with the possibilities of exporting electric power from Yugoslavia separately to Austria, Western Germany and Italy. It also gives an analysis of the market value of power to be exported, on the assumption that winter current (from the beginning of October to the end of March) would flow from Yugoslavia at full capacity for 16 hours a day, with somewhat reduced capacity during the night hours, and the price of the winter power arrived at ranges from 0.82 to 1.62 US cents per kwh. the average being 1.20 US cents per kwh.

The technical section gives a survey of the potential power of Yugoslav waters and of the available fossilised fuels. It also gives the plans of four new projects and of the Ferucica plant, which should be built quicker and on broader lines than necessitated by the present rate of increase in home consumption of power. Foreign credits, if granted in time to speed up the construction of the Ferucica plant, would enable the export of several hundred million kwh. of power yearly from the 1957-58 winter onwards, which would improve the chances of realising the Yugelexport plans. This part of the study further gives plans of the necessary network of transmission lines, together with the preliminary expenditure for the construction of all projected installations.

Financial Section

The total expenditure for the five projects amounted to 309 million dollars for Plant and 70 million dollars for transmission lines.

The financial section deals with matters connected with the finan-

cing and amortisation of the projects, assuming that the necessary expenditures would be secured through long-dated credits, such as those granted by the International Bank (at 4% interest and with a moratorium of 5 to 7 years), through commodity credits and through re-investments of a part of profits from the sale of power.

Inter-governmental Corporation

The organisational-legal section of the study deals with the various possibilities for the realisation of the Yugelexport plans, considering them primarily from the viewpoint of international law. The proposed solutions are the concluding of ordinary contracts for power supplies between companies from the countries concerned and the possible setting up of an international enterprise on the basis of a multilateral inter-state agreement, which would finance the construction of the plants and transmission lines and conduct the selling and buying of power. That enterprise, which could be organised as an international corporation and in which the interested governments would be equal partners, owners and managers, could seek credits on the international money market, not only in the countries which would import power, but also in other places where favourable terms could be obtained as well.

In this way it would be possible to draw a clear line between the credits granted to Yugoslavia for the development of her own economy and those given to such an international enterprise which is to use them only for the construction of projects—in Yugoslavia and in the importing countries which would serve their intended purposes, i.e. to enable to find, through the exports of winter electricity from Yugoslavia, the best possible solution to the serious power problem encountered in a number of European countries. Since the realisation of the Yugelexport idea would be of equal interest to Yugoslavia and to her neighbours, it is clear that what is involved is a real international project, whose financing should not prevent Yugoslavia from obtaining credits on its own account.

Bilateral Contracts

The Yugelexport Organisational-legal Committee suggested that the concluding of bilateral agreements should be entrusted to a special body, which would be set up for the purpose. This means that it would be possible to form an International

enterprise as explained above and, at the same time, organise another Internal body, so that both of them could see that the export of electric power from Yugoslavia is carried out in a proper manner. One of the tasks of this special body would be to turn all bilateral contracts into a single workable system, and to couple them with multilateral inter-state arrangements, which would guarantee the continuation of supplies and the facilities of making payments, paying due attention to taxes and other duties which the concerned countries might impose on the imports and exports of electric power.

That effective and successful international co-operation took place during the drafting of the Yugelexport study, it is hardly necessary to mention. To overestimate its value would be going too far, but to underestimate the prospect thus opened out would be thoughtless, for it will be no exaggeration to say that it is possible to discern in the Yugelexport study the beginnings of a new system of integration covering the basic sectors of the economies of a number of neighbouring countries.

Yugelexport has completed its task, but its idea has not yet been realised. It is now up to the governments of the interested countries to do something if they wish to realise a plan which would be of interest to their countries. So as to reach practical results as soon as possible, the ECK Committee for Electric Power has unanimously adopted a resolution, recommending to the Governments of Yugoslavia, Austria, Italy and Western Germany the formation of a mixed Commission composed of two delegates from each country, whose duty would be to follow developments, to study various possibilities for the realisation of the Yugelexport plans, and to facilitate the concluding of inter-state agreements, which would serve as a basis for bilateral arrangements between companies concerned, and, generally, to co-ordinate both the study and the realisation of individual stages in exporting winter electricity from Yugoslavia.

At the session of 'Yugelexport' to be held in September in Geneva, Yugoslav experts will submit documentary material concerning the building of a system of water power stations in the Treblsnjica drainage area (in Yugoslav province of Hercegovina). On the basis of studies carried out in 1952 and 1953, this system was finally included in the

'Yugelexport' plan for the construction of water power stations in Yugoslavia for export of electric energy. The water power stations in the Trebisnjica drainage area would give in a medium year about 1.5 milliard kwh and would constitute the most important and most powerful plant in the 'Yugelexport' system.

At the recent consultation of experts at Trebinje, interesting data were given out about the geographical and other conditions under which this system is to be created. The Trebisnjica drainage area covers about 2000 square kilometres and receives a very large quantity of waterfall— from 1600 to 5000 mm annually. Trebisnjica itself, one of the most remarkable rivers for its underground currents, flows through Popovo Polje, and there is an accumulation of about 400 million cubic metres of water during the October-May period. The area is rich in vegetation and green with crops in the summer. Trebisnjica has an average flow of 100 cubic metres of water per second or about 3.3 milliard annually. Its total fall of 400 metres would be utilised by two water power stations. For ensuring water for the first power station, a dam 110 meters high would be erected in front of which an accumulation basin of about 1.3 milliard cubic metres would be formed. The power stations would be about 200 MW. The second water power station would be erected on the seashore near Plata, between Cavtat and Mline, and its power would be about 650 MW. Water would come to this power station through a tunnel 17 km. long.

The whole system of water power stations at Trebisnjica could be used, in the opinion of experts, both for meeting domestic needs and for the export of electric energy. At the same time. It would put an end to the flooding of 5000 hectares of the most fertile land around Trebinje and the Popovo Polje area, while 12,000 hectares of land would be irrigated—land which yields two or three harvests per year. The value of the increased yield from irrigation alone has been estimated at US \$185 mm. Yugoslav hydro-electric potential is estimated at approximately 60 billion kwh electric power annually, and export of 4.3 billion kwh annually to Austria, Italy and Western Germany are considered feasible. One of the first concerns of the Yugelexport was to ascertain the potential export mar-

ket. It was found that Austria, Italy and Western Germany lack sufficient sources of electric power and that their requirements will exceed four billion kwh by 1960. It was also established that such export would be concentrated during the winter months.

To develop the above potential, it has been proposed to construct five giant hydro-electric plants and

a transmission net-work. This will be a six-year programme and cost \$380 m. (US). Yugelexport has selected four new projects which would harness the waters of Zeta, Trebisnjica, Lika-Gacko and Idrijea. Apart from this, the extension of the Perucica hydro-electric plant on the Zeta river which is currently under construction has also been suggested.

The basis data for the projects would be as given below

Project	Installed capacity (in MW)	Possible output (in Mil. kwh)	Cost of construction (in Mil. \$)	Time required for construction (Years)
Cetina	530	2,250	94	6
Lika Gacko	242	920	42	5
Trebisnjica	840	2,300	116	6
Idrijea	112	340	46	4

The expansion of the Perucica plant by new generators with a capacity of 144 MW necessitating a total outlay of 11 million dollars will enable the export of about 450 mn. kwh of winter current.

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