

duction. Rumania exports tractors to the developing sector.

The mechanization of agriculture

The scale of mechanization of Romanian agriculture in the postwar era, and most pronouncedly since 1965, can be seen in the following figures concerning tractor production; 1950, 23,700 tractors; 1965, 81,000; 1981, 155,000; and 1983, 160,000. Tractor production has doubled since 1965. The figures for self-propelled combines are much more dramatic: from 292 in 1965, to 44,000 in 1981 and 50,000 in 1983. The center of the Romanian agriculture machinery industry is in Brasov, a city nestled in the Carpathians, 160 kilometers north of Bucharest. Brasov is also a center for truck and helicopter production. In June, the 920,000th tractor came off the Brasov production line. One yardstick of the mechanization is the number of tractors per hectare. In 1938, it was one per 3,500 hectares. Now it is one per 60 hectares.

Romania has been unable to achieve the gains planned in agriculture in the 1980s, because of repeated droughts, each year more severe. This year's drought was the worst in 100 years, worse than the previous drought records for the 20th century, set in 1903. Despite this, Romania, unlike the Soviet Union, has not had to import any grain, and in fact Romania only imports food products that cannot be grown in Romania's climate, like citrus and tropical fruits, and feed grains for its livestock.

The commitment to mechanization is also seen in the agriculture investment figures for the 1981-85 Five-Year Plan. Regarding agricultural investments, 34 percent is slated for mechanization, 17 percent for land improvement, 31 percent for livestock, another top priority, and 15 percent for vegetable, fruit, and vineyards cultivation. To gauge the scope of the irrigation program now underway as a top national priority, the entirety of Romania's arable land under cultivation is 10 million hectares. Of that total, already 2.4 million hectares, or 24 percent are irrigated. The 1985 goal is 4 million, or 40 percent, and for 1990, 5.5 million, or 55 percent of arable land. The present geographical area of concentration in the irrigation program is in southeast Romania, on the Wallachian Plain, just west of the Dobruja.

The further modernization of agriculture is key to increasing the labor force in industry and construction. Twenty-six percent of the labor force, or 2.8 million people, now work in agriculture, of whom over half are more than 40 years old, and over half are women. These factors combine with a generally lower skill and educational level, as reflected in the fact that this 26 percent of the work force accounts for only 16 percent of the national income. By 1990, these two percentages will be more or less equal.

Romania has had an impressive city-building policy for the last 20 years, featuring a massive housing program that continues unabated today. Everywhere one goes, one sees construction activity, old neighborhoods being torn down, and blocks of new apartment buildings rising. Bucharest is ringed by new satellite cities, most built in the 1970s.

Only the Bosphorus limits shipbuilding

by Edith Vitali

Today's world of shipbuilding is bereft of success stories, especially in the so-called advanced sector: Yards are being closed down, workers are facing mass layoffs—be it in Hamburg, New York, or Göteborg.

However, we have discovered one of the great exceptions, one inspiring example of how the shipbuilding industry can blossom if it is adequately treated as a national priority sector. On July 4, our group was the guest of Constanza's great shipyard and its director of export sales, Mr. Dumitru Muhcina. The Black Sea port Constanza, which the ancient Greeks called Tomis, and which was the asylum for the Roman poet Ovid, today handles 50 to 60 percent of Romania's exports, 40 percent of which are machine tools.

Romania has two ambitions: First, it wants to transport all sea freight to and from this country on their own ships. Second, Romania aspires to produce all components for shipbuilding domestically. On our way to the yard, we passed the rather new factory for ship engines in Constanza.

"I just love to build ships," said the director at the shipyard, while we were standing in front of several models, representing different phases in the development of the yard.

Ninety years ago, it began as two small workshops with repair facilities only. In 1938, an 8,000-ton floating dock was acquired, and in 1965, a floating dock of 15,000 tons was added. However, the two docks were utilized only for repair. A real turning point came in 1968: the beginning of actual shipbuilding. The first type was a small 1,920 dead weight ton (dwt) freighter produced for export. "We've never had any complaints from our customers," said the director proudly. In 1972, the shipyard assumed its current appearance, and in 1973—again exponential growth—a series of 55,000 dwt ships went into production. The first one was delivered in 1975 to the Romanian shipline Navrom.

In the same year, production of a 65,000 dwt bulk carrier and of a 150,000 dwt tanker started. "Our production is first of all for the domestic market," the director underlined, "but three of the 65,000 dwt type were exported to Japan, Hong Kong, and Greece. The only limit to the size of ships is the Bosphorus. If it weren't for the Bosphorus, I'd love to build even bigger ships." Right now, the fourth 150,000 dwt tanker is in production.

During a walk through the huge construction hall where large metal plates are being cut and welded into shape on

automated production lines, the director agreed that the productivity of the cutting procedure could be increased exponentially with the use of lasers. But such equipment is too expensive for the moment.

Outside the hall, huge cranes—the two largest ones, produced in the U.S.S.R., can lift 900 tons together; smaller ones, built in Romania, lift 50 or 150 tons—pick up the prefabricated block sections and carry them to the floating docks, of which there are three with two chambers each.

Are all the capacities being utilized, we asked, with the situation of the Western shipyards in mind. “Yes, until 1985 we are fully booked with orders,” he replied. This means full employment for the yard’s approximately 6,500 workers. In 1955, there were only 600.

The Danube-Black Sea Canal: a modern epic

by Webster G. Tarpley

In an office in the outskirts of Constanza we are introduced to Engineer Sergiu Ivanov, in charge of mechanization for the Danube-Black Sea Hydropower and Transport System. Ivanov is a hearty man in his late fifties, tanned by the sun of the Pontus. He has been working on the canal since its inception back in 1975. He relates with pride that his son and daughter are studying electromechanical engineering in Craiova, a center of heavy industry west of Bucharest.

Ivanov told us the first projects for a canal from the Black Sea to Constanza date back one and a half centuries. Today Romania is building the canal to facilitate the transfer of growing imports and exports, more than half of which go through the port of Constanza, built up in the last century by the Italian-Romanian engineer, Saligny. By building a canal of some 65 kilometers from Cernavoda on the Danube, which is also the site of the country’s first nuclear reactor, to a point south of Constanza, it will be possible to save a 400-kilometer trip north through the Danube Delta, which is also near the frontier with the Soviet Union. Ivanov cites figures to show that with freight tonnage rising to 150,000,000 within a decade or two, the canal will pay for itself within “only 75 years.”

To procure those savings and related benefits, the Romanian government has decided to implement what Ivanov calls “the largest single investment in the history of the country.” The canal, now in its ninth year of construction, employs a small army of workers, 30,000 in number, who are operating some 5,000 trucks and 50 separate types of earth-moving equipment to move 300 million cubic meters of earth and pour 3.5 million cubic meters of concrete. Ivanov reels off the details: his workers have completed the construction of eight bridges and 150 kilometers of roads. Most impressive, they are in the final phases of cutting their way through

the bluffs of the Dobruja plateau, where at various points the canal has had to be cut some 70 meters deep into chalk hills, with constant threat of inundations. Almost 90 percent of this work was mechanized,” says Ivanov. Ivanov goes on to say that the canal is part of a comprehensive strategy of regional development. This includes whole new towns, and new neighborhoods in older towns, for the canal workers. At Medgidia there is a large new cement factory to meet the needs of the construction. Along the canal there will be three ports, plus a seaport at Constanza.

Most important will be the benefits for agriculture. The canal will provide some 180 cubic meters per second of water, which is already being used to irrigate a land area that will shortly reach 400,000 hectares. Topsoil taken off hill-sides has been redeposited to form new arable land.

Ivanov then points to the other side of the project, which is the improvement of labor power. The Romanian economy had no skilled labor reserves to shift into canal building, so it was imperative to train canal builders and civil engineers on the job. All along the canal, schools have been built for 27 trades, and many of their graduates are young recruits from the Romanian army assigned to the project. Instruction goes up to a junior degree in civil engineering granted by a higher education institute in Constanza, created to serve the canal. The new skilled labor will be moving on to another canal to be built from kilometer 37 on the Danube-Black Sea Canal over to Cape Midia. There will also be a canal from Bucharest to the Danube which Ivanov says will make the Romanian capital a port for the North Sea and the Black Sea. Further projects will complete a national canal system.

We pile into a battered mini-bus for a ride under a broiling sun to some of the key remaining construction sites. At Agigea Ivanov shows us the massive locks under construction, designed to keep the salt water of the Black Sea out of the fresh-water irrigation system. There is another set of locks at Cernavoda at the Danube end. The dusty roads are filled with heavy dump trucks; the make is Român Diesel. Ivanov points out that the role of Romanian equipment in the building has been maximized. He shows us a striking suspension bridge, noting with satisfaction that this too is an original Romanian solution to an engineering problem.

Parallel to the canal there is a belt winding through the countryside—a 17-kilometer-long conveyer belt that is taking clay and subsoil to the Black Sea coast, where it is being used for landfill to reclaim new land. “That is our project for the peaceful expansion of Romanian territory,” he jokes.

Ivanov says that he had been in Dortmund, West Germany some years earlier to see the biggest earth mover in the world, slated for use in building the Rhine-Main-Danube Canal in West Germany, since delayed by greenies and cost-cutters.

“It is a great honor for everyone who is working on this canal,” Ivanov says. “We think that this project is a kind of epic. What we are doing here can stand comparison with the canals at Suez, at Panama, at Kiel, the Volga-Don.”