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THE BELCHATOW MINING AND POWER PRODUCING DISTRICT

The papers which are to be presented at the Anglo-Polish seminar by Janina Bernacka-Baranowa and Nina Kołatek concern the same main problem, viz. the industrial impact on agriculture in an area which is being intensively industrialized. The area of concern has a particular nature, as it has been developed as a large mining and power producing complex.

Near to the former small country town Belchatow, some 40 km south-west from Lodz, rich brown coal deposites have been detected. They amount to 1.2 milliard tons with a heat value 6.9 - 9.0 MJ/kg (1650-2150 kcal/kg = 6550-8530 BTU/kg). As it has been located almost centrally in the country, it can play an outstanding role in supplying Central Poland with relatively cheap electricity. Within the radius of 150 km there are situated such large cities and industrial centres, as Lodz, Warsaw, Radom, Kielce, Krakow, Katowice, Opole, Wroclaw, Czestochowa and many other concentrating in their administrative boundaries some 6 million inhabitants. So, it has been decided to build on open cut mine with an yearly output of some 40 million tons of fuel, which can run a power plant with an installed capacity of 4300 MW and the yearly production of about 27 milliard kWh, one fourth of the present country's output. The total investment program requires a very large area, estimated at over 6000 ha, the bulk being needed for open cut mine and heaping up the unproductive overlayer. At least two thirds of this acrage will extend on arable land.

The exploitation of coal presents numerous technical and economic problems. First of all, the unproductive overlayer is

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thick, in average 140 m. However, the coal seam averages 54 m, so the relation between the unproductive and productive layers is rather advantageous, as it ranges two and a half to one. Well, the yearly remove of unproductive material amounts to 110-130 million tons, which are to be deposited not too far from the excavation. For a long time span the heaped up material disengages large areas from any biotic production, amounting to some 2000 ha.

The hollowing out the mine is a specific technical scope. Of course, the overlayer is composed mainly of loose sedimentary rocks, and therefore the opening surface is to be many times larger than the bottom. Thus, the engagement of agricultural and forested land is much greater than it would be in the case the overlayer was composed of solid material, as e.g. in Kolonia Brown Coal District, Western Germany, or Latrobe Valley, Victoria in Australia, where the largest world energetic centres had been developed on the base of open cut exploitation of lignite.

The loose composition of the overlayer involves two other burdensome after-effects: soil desiccation, and instability of slopes. Through the loose texture water easily leaches out into the deep hole, from where it is to be pumped out. Thus, double harms start up: deterioration of agricultural and forested land in the radius of some tens kilometers as a consequence of desiccation of soils and water shortage in agricultural farms, especially needed for animal raising and household management, as well. The deep breaking into the rocks structure destabilizes their inner pressure equilibrium, so sporadic earth tremors and landslips occur.

The construction and functioning of the large power plant involve both the diminution of agricultural and forested land, and profound changes in the ecological conditions of biotoc production, and human life as well. The most dangerous and harmful the air pollution is. Burning of some 40 million tons lignite yearly emits into the air an enormous amount of combustion gases, calculated at 10.4 g SO_2 per 1 kWh totalling 280.000 tons per year on average, big oxide masses of carbon, nitrogen, etc. In the same time huge masses of the finest dust particles,

which cannot be caught away by electrofiltres, penetrate into the air. In order to diminish the concentration of air polluting substances superhigh smokestacks (300 m) have been built. By means of them the air pollution substances are carried out in an altitude of some 600 m. Of course, the state of emergency in the close area of the plant has been reduced by this way, yet the noxious influence on men, flora and fauna has been virtually widely diffused.

Simultaneously with deep environmental changes essential alterations take place in socio-economic structure. First of all, a quite new employment structure is going to be created. According to the prognostic studies in the whole area of the Belchatow Industrial District employment in agriculture will drop from 32,000 to 20,000 (at 38%), outside of agriculture it will rise from 59,100 to 102,300 (at 73%: in mining, energy and construction at 78%, in other branches at 64%). The deepest changes will take place in country settlement units, such as villages and small towns. Total population number is expected to rise from 140,000 in 1975 to more than 215,000 in 1990 (at 55%), but in the main residential and administrative towns the growth will be much faster. So, e.g. there is to be expected in Piotrkow Trybunalski, the Voivodship centre, the increase from 84,000 to 136,000 (62%), and in Belchatow, the main residential centre of workers and medium technical staff, from 20,000 to 41,000 (101%). In reality, the population growth of Belchatow has surpassed every expectation, as it reached the foreseen number for 1990 already in 1983. Together with the fast urban population increase the social and technical infrastructure is being expanded: water supply and severage facilities with clearing devices, central heating plants, pipe gas, hospitals and other medical institutions, schools and preschool education units, recreation, sport and free-time arrangements, etc. The reconstruction of urban settlement units aims step by step at the modernization and betterment of the living quality of their inhabitants.

Transformations, shortly signalled above, lead to deep changes in agriculture. The continued shrinkage of agricultural land together with the diminution of manpower reduce the number

of farms. Agricultural production suffers losses under the impact of ecological degradation, whereas the demand for agricultural products increases fast both, under the pressure of growing number of population and its social transformation, and growing family income as well. These sharp discrepancies, which are steadily increasing, challenge rational and far-sighted economic policy and planning, in order to limit negative processes and favour the advantageous transformations.

The Department of Space Economy in the Institute of Regional Policies at the University of Lodz has been for many years involved in these questions. By systematic studies it is concerned to identify both the state of affairs and the development tendencies. By this way it is meant to supply the administrative and planning authorities with virtual backgrounds for appropriate decision making.

The presented papers are only a fragmentary element of the research work.

Mrs. N.Kołatek endeavours to trace back the influence of industrial transformations on the ownership structure of agricultural land. In the first industrialization phase (1974-1982) some 5000 ha were transferred from the private sector to the State Land Fund[1], which together with the formerly taken over acreage surpassed 6000 ha. From this area almost two thirds were transmitted to the socialistic sector, and less than one fourth to the private one. There was intended both creation of new farms and enlargement of already existing, which were too small to be effective enough. This turn-over of land differentiated clearly in spatial patterns, and farm size structure, as well.

In general, there was to be observed a tendency, which could be called a polarization process of farms. It means that the number of farms in extremal size groups was remarkably increased, viz. in the undersized (below 2 ha) and the largest ones (over 7 and 10 ha). In the medium size (2-7 ha) somewhat of selection was brought about: some of them disappeared completely, some others divided their property into small parcels

[1] Implementation of this transfer is being presented in Mrs. Kołatek paper.

(plots) for gardening and recreational purposes, and the remaining enlarged their acreage by buying in land from the State Land Fund.

The regularity mentioned above manifested a particular spatial picture, viz. the decreasing process both, in number of farms and their average size, went on in the central area of the Industrial District, i.e. around the coal mine and the power plant. The reason of it may be obvious. The immediate vicinity of large establishments creating a huge number of labour places forces peasants to look after jobs with high wages and regular working time, connected simultaneously with broadly developed social services. Small land plots, however, were usually retained as an additional source of family income, and object of hobbistic activity. It cannot be excluded, that a number of biprofessional persons intended also to organize step by step (as the financial means have been accumulated) hothouses for growing vegetables and flowers. Of course, this kind of economic activity leads in the quickest way to become in Poland millionaire, indeed.

The same process is being under way in the vicinity of Belchatow, the main residential centre of workers and medium technical staff. In the time span 1974-1982 the decreasing rate of farm number and total area was about 20%.

The opposite tendency of increasing both, the number and average size of farms speeded distinctly in the outer fringe of the Belchatow Industrial District, mostly to the North and South of the expanded industrial project, where the environmental conditions for agriculture seem to be more favourable than elsewhere. Since the early 80-ties this process has been remarkably supported by the financial state policy, as the bank credit for enlargement and technical equipment of farms has been easily given at low interest rates, and the extinction of indebtedness can be granted proportionally to the investments done.

Well, the stated process of agricultural land-flow seems to be a logic model, and from the economic point of view promising well. The inner area of the District has been clearly subordinated to the needs of the big producing establishments

and people living here. The outer fringe is going to constitute a food zone for the consumer market, which tends to be larger and larger.

However, there isn't but one still unknown quantity, viz. how agriculture may thrive here, as the agroecological conditions will steadily change into worse and worse quality. The impact of air pollution and soil desiccation will rise, the protective function of forests and woods will decline. Simultaneously, there will arise quite a new question, what the sanitary value of agricultural products raised here may be in the future.

Seriously, the question is to be put to the planners and politicians, in order the premise "après nous le déluge" should be not assumed. On the other hand, how to master the inevitable fate: energy is to be produced on the base of media every society has to its own?

Mrs. J.Bernacka-Baranowa tries to research the industrial impact on animal production. This question has an outstanding rank, as the food consumption model changes very fast along with the change of society from rural to urban, and the family income increase. Generally, the pressure of animal products grows quicker than it declines on plant food.

Animal raising used to be determined by a lot of factors:

1) fodder supply;

2) labour resources in agriculture;

3) technical equipment of homesteads, especially with water and sanitary devices, mechanic tools for feeding and getting the final products;

4) market demand;

5) price relations between plant and animal products, and between the main animal products themselves.

This wide complex of factors has been changing in Poland for the whole period of the People's Republic. Thus, the instability of agricultural policy influences currently decision-making of farmers.

Cattle raising is mainly based on grass land and fodder plants grown on fields. In the area of concern the share of grassland in the total agricultural land is not high. At worse,

in many places the grass yield per hectare declines as the soil desiccation proceeds. Farmers attempt to compensate losses with enlarging the field acreage devoted to fodder crops. So, the fodder costs increase and the prices relations between plant and animal production play the more and more decisive role.

In the period of studies the prices for animal products were fixed unfavourably. So, farmers usually preferred growing food crops, mainly rye and potatoes, as the predominant sandy soils did not allow to extend more valuable crops. Things being as they were, most pig raising was discouraged. Similar phenomenon was to be observed in sheep raising. Mutton and lamb are not commonly consumed in Poland. The main purpose of sheep raising are wool and furs. As the fodder shortage became more and more acute, sheep were losing their competitive value.

Price relations between main animal products, meat and milk, until quite lately favoured rather meat than milk production. So, simultaneously with the general decline of cattle stock (fodder shortage!) the structure of herd remarkably changed. The milk cow number dropped at a higher rate than the total decline.

Changes of the same kind were also provoked by labour exodus from agriculture. As it is commonly known, animal raising, especially dairy farming, engages much manual work when technical equipment does not replace it. And this was the case (and is still now) in the researched area.

Processes shortly recorded above do not develop equally all over the area. To some degree they reflect similar tendencies as they were stated by Mrs. Kołatek in her study. However, the spatial pattern is not as clear as in the case of land-flow and farm-size structure. Well, the picture is being dimmed by price levels and relations. One industrial impact on animal production is out of any doubt, viz. the negative influence of labour flow from agriculture to non-agricultural jobs.

For planners and politicians there is a crucial scope to be solved in the nearest future: to master the problem, because animal foodstuffs are badly needed now, and the social pressure on them will steadily increase.

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BEŁCHATOWSKI OKRĘG GÓRNICZO-ENERGETYCZNY

Bełchatowski Okręg Górniczo-Energetyczny rozwija się na bazie bogatych złóż węgla brunatnego wydobywanych odkrywkowo około 40 km na południowy-zachód od Łodzi. Roczne wydobycie paliwa wyniesie docelowo około 40 mln t, zaś łączna zainstalowana moc elektrowni 4300 MW. Cała inwestycja zajmuje ponad 6000 ha ziemi i zatrudnia kilkadziesiąt tysięcy osób. Nastąpią więc istotne przeobrażenia w użytkowaniu ziemi, w sieci osadniczej oraz w strukturze społeczno-gospodarczej obszaru. Jednocześnie pojawią się wysoce skomplikowane problemy środowiskowe.

Przedsięwzięcie na tak wielką skalę wymaga m.in. badań naukowych z różnego zakresu. Zakład Gospodarki Przestrzennej Uniwersytetu Łódzkiego od lat w nich uczestniczy. Niniejszym publikuję krótkie sprawozdanie ze studiów nad wpływem inwestycji na przeobrażenia zachodzące na badanym obszarze: pierwsze - obrót ziemią, drugie - produkcja zwierzęca.