

Stabilisation and Training of Manpower in the Forestry Industry in Byelorussia

by

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Forestry has long been Byelorussia's main industry. Formerly, however, it was carried on during only part of the year and drew its workers largely from the agricultural labour force. The author of the following article describes how, by planning the management and utilisation of forest resources, rationalising and mechanising work processes, making vocational training available to all, and providing satisfactory conditions of life and work for forestry workers, the Byelorussian authorities have succeeded in creating a permanent, skilled and productive labour force for the industry.

BYELORUSSIA has always been famed for its forests. A hundred years ago their unbroken mass sheltered many valuable animals, including European bison, bears, elks, deer, beavers, otters and martens, and hunting was a source of income for a large part of the population.

In 1887 forests covered 41 per cent. of the area of Byelorussia. Before the October Revolution 75 per cent. of the woodlands belonged to a handful of landlords, aristocrats and other private owners.

The geographical situation of Byelorussia, with its rivers providing floating facilities to the Ukraine and the Baltic Sea, and the comparatively well-developed network of railways, encouraged the expansion of the timber trade both at home and abroad.

Byelorussian timber has always been considered of high quality, particularly the oak and pine, which were much in demand in foreign markets. Taking advantage of this, the private owners aimed at making high profits by indiscriminately felling whole forests, particularly those within easy reach of floatways and rail-

ways. According to figures supplied by the Central Statistical Administration, a quarter of the timber exported from Russia between 1913 and 1917 came from Byelorussia.

Stripping wide areas of woodland, the private owners cared nothing for reforestation. As a result, the forested area was considerably reduced, and stood at 33 per cent. in 1912, 8 per cent. less than in 1887.

Between 1882 and 1914 an area of some 800,000 hectares was denuded of timber, whereas only 12,500 hectares were planted. Nothing was done to encourage natural renewal or to protect the forests.

Until the Revolution the forestry industry within what now constitutes the Byelorussian S.S.R. was manned exclusively by seasonal workers. There were no forestry undertakings working the whole year round. The woodman's tools were the axe and the handsaw. The workers were cruelly exploited. Conditions of work were very hard, the working day lasted 12 to 13 hours and earnings were exceedingly low. Housing and living conditions at logging camps were particularly bad.

In the ninth volume of the *Complete Geographical Description of Our Country*, which was published in 1905 and edited by P. P. Semyonov, interesting information is to be found regarding the number of seasonal forestry workers and their earnings. In 1899 there were 7,400 woodcutters in the Vitebsk province; their total earnings for the season amounted to 136,800 roubles, which works out at just over 18 roubles per head for the season. In the same year 7,320 peasants were engaged in hauling operations, with their own horses; their earnings amounted to 247,035 roubles, or about 30 roubles each for the season. There were up to 10,300 workers engaged in floating; with their total earnings of some 190,000 roubles they earned an average of less than 19 roubles each for the season. As the working season lasted up to six months a year, the forestry workers clearly had to exist on starvation wages. Information in the same book relating to the other provinces of Byelorussia reveals a similar picture.

The general devastation of the Byelorussian economy in the First World War seriously harmed the forestry industry. In order to meet war needs and supply fuel for the railways leading to the front, for the towns and for other purposes, the forests were indiscriminately ravaged, with no thought for their preservation. Enormous damage was also done during the temporary occupation by the interventionist forces. At the end of the war the forests were in a state of devastation, cluttered with debris and shockingly neglected. The wooded area amounted to only 27 per cent. of the country in 1922.

GENERAL ORGANISATION OF FORESTRY

Following the October Revolution all forests were nationalised. The Soviet authorities at once started putting the forestry industry in order by measures for immediate development and protection combined with clearance. Felling was permitted only by authorisation. Large-scale reforestation was undertaken with the help of workers from the towns and villages. An annual "Forest Day" was introduced, and this has become a tradition in Byelorussia, with all able-bodied citizens participating enthusiastically in renewal operations.

The subsequent development of forestry in Byelorussia has been based on three fundamental principles—

(1) State-planned organisation of forestry as one of the sectors of the national economy.

(2) Scientific specialisation in forestry on a nationally planned basis, in the light of the natural and economic conditions and the importance of woodlands in the economic life of individual regions.

(3) An active and dynamic forestry policy aimed at developing forest resources in order to meet national requirements for timber without prejudice to soil and water conservation.

State-planned organisation of forestry means that the whole productive activity of the forestry industry is the responsibility of government organs and is centrally planned in the interests of the whole national economy.

Forestry is regarded in the Soviet Union as having a complex function to perform. The authorities avoid any narrow view of the forests as a mere source of timber for the country. The functions and importance of woodlands vary widely according to the differing natural and economic conditions prevailing in the various regions of the Soviet Union. In heavily forested areas their role is above all to supply timber; in thinly forested, dry areas their principal function is to retain and distribute water and protect the soil against erosion. In the vicinity of large towns and industrial centres, as well as in health resorts, they serve primarily to provide more healthy and beautiful surroundings.

In order to preserve forestry resources and to ensure that they are rationally used and conserved, legislation in Byelorussia places the forests under the authority of the water conservancy department. Administration and logging operations are kept entirely separate. The former is the responsibility of independent forestry organisations, the "leskhozes", whose duties include forest management, renewal and reproduction, the allocation of forest

areas to health resorts, fire-prevention, authorising felling of mature and over-mature stands, and general forest maintenance and clearance.

Logging operations, on the other hand, are the responsibility of government timber undertakings, or "lespromkhozes". These have their own districts in which they are authorised by the forestry organisations to fell mature or over-mature stands. Felling operations are systematically planned.

Under section 6 of the Constitution of the Byelorussian S.S.R., the forests are the property of the State, which means that they are owned by the whole people. Over 65 per cent. of the forests are attributed to government authorities and undertakings, some 28 per cent. are allocated to collective farms in perpetuity and the remainder is divided among state farms, national parks and other organisations.

The government-administered forests are divided into two categories for the purposes of economic operation and forestry administration. The first category consists of the national parks, the green belts around towns and industrial centres, the plantations providing shelter for croplands and protective plantations alongside railway lines and highways. Timber felling in these forests is limited to improvement and renewal cutting. The second category of forests consists of those subject to felling and areas for the protection of the main rivers and their tributaries.

The majority of trees in Byelorussia are saplings and medium-age plantations, the proportion of mature and over-mature stands being slight. The percentage of saplings in government forests amounts to 58.1, medium-age plantations accounting for 24.5 per cent., maturing trees for 11.5 per cent. and mature and over-mature trees for 5.9 per cent. This situation reflects the considerable reforestation that has taken place during the Soviet era.

Between 1922 and 1941 an area of 339,800 hectares was reforested through sowing and planting, 27 times more than in the 32 years before the Revolution. Renewal activities have been particularly intensive since the Second World War. From 1944 to 1956, 500,000 hectares of forest land were sown and planted. In this work the guiding principles have been to improve forest stock and increase production by introducing the most valuable and rapidly maturing species and by draining marshlands.

Byelorussian forests contain a wide range of species, which is a great economic asset for the country. The woods most used in building, veneering, match-making, furniture-making and other branches of production are found in profusion. The main types are pine (occupying 58.1 per cent. of the forested area), birch (13.3 per cent.), alder (9.4 per cent.), fir (9.5 per cent.), aspen (3.9 per cent.),

oak (4.8 per cent.) and hornbeam (0.4 per cent.). Other varieties occurring include ash, maple, elm and lime.

During the first five-year plans for the development of the national economy of Byelorussia, the development of forestry was secured by a basic reorganisation of the industry. The industrialisation of the country provided timber undertakings with all the machinery and equipment they needed, including trucks, locomotives and tractors for hauling. Following the elimination of the exploitation of man by man and the transfer of the forests to the people, new occupational relations were established, conditions of work were improved and earnings rose. As a result labour productivity increased. In 1940 there were 85 forestry organisations responsible for the administration of forestry operations and 66 timber undertakings responsible for felling and hauling. The latter had considerable housing facilities and employed skilled woodmen on a year-round basis. Over 7 million cubic metres of timber were felled for the national economy.

The peaceful constructive labour of the Byelorussian people, like that of all the peoples of the Soviet Union, was interrupted by the treacherous invasion of the Nazi aggressors. They occupied Byelorussia in 1941 and did enormous damage to the popular economy, including forestry. They ravaged the country's forest resources, stripping wide areas and transporting the timber to Germany. Incomplete statistics covering the war years indicate that over half-a-million hectares of valuable forest were felled and destroyed during the period. The wooded area fell drastically, so that in 1946 it amounted to only 22 per cent. of the national territory.

Since the war a great deal has been done to renew and develop the forests of Byelorussia in the course of successive five-year plans. The following is a list of the principal measures applied:

(1) For administration and utilisation of timber resources the forests were divided into two categories.

(2) Very considerable cut-over areas, thinly wooded areas and wastelands were afforested.

(3) Sandy, broken and other ground unsuitable for agricultural purposes was afforested.

(4) Low-density and unproductive young plantations were converted into highly productive stands through the introduction of the species best adapted to conditions in Byelorussia.

(5) Unproductive stands on marshlands were improved.

(6) Marshlands were drained and planted with the main local species.

(7) Low-density medium-age stands were converted into highly productive stands by the introduction of the most suitable species for local and environmental conditions.

(8) Numerous nurseries were established.

(9) Provisions were taken at felling sites and in maturing and matured low-density stands in order to ensure natural renewal of productive, high-quality species.

(10) Fast-growing and valuable species were introduced, and scientifically planned; mixed plantations were cultivated for increased production.

(11) Special measures were taken in order to increase the quantity and quality of forest stands and to advance their marketable age. Improvement cuts were made without reducing density.

(12) Strict measures were widely introduced for fire-prevention and for pest prevention and control.

(13) Maximum use was made of pine plantations through prior tapping of resin from trees to be felled.

(14) Existing national parks were rehabilitated and new ones established; the same was done for hunting reserves, which were also stocked with a wide variety of wild life.

(15) Assistance was provided to collective farms in their forestry operations.

All the above measures continue to be systematically applied as part of the regular duties of every forestry organisation in Byelorussia, and considerable sums are allocated for the purpose by the state budget every year.

Without going into too much detail concerning the results achieved, it may be said that forestry has not only regained its pre-war level but also considerably exceeded it. In 1959 the wooded area amounted to 31.5 per cent. of the national territory, 9.5 per cent. more than in 1946. Over the past three years tens of thousands of hectares have been reforested (table I).

TABLE I. FELLING AND REFORESTATION IN BYELORUSSIA
FROM 1957 TO 1959
(Thousands of hectares)

Operation	1957	1958	1959
Felling for production	42.9	45.4	39.6
Reforestation (sowing, planting, and encouragement of natural renewal) . . .	58.3	53.2	51.3
Sowing and planting only	43.0	42.9	41.2

The central authority responsible for the forestry industry and forest conservation is the Central Forestry Administration of the Council of Ministers of Byelorussia, together with its regional forestry administrations, which are responsible for 80 forestry organisations. Each forestry organisation has from six to ten sections and is run by a director with a senior forester as deputy. The staff includes forestry engineers specialising in silviculture, conservation and forest management. Sections are headed by a forester, who, with his assistant, specialists and skilled woodmen, is responsible for all the forestry and silvicultural operations.

The forestry organisations operate on the most modern lines. They have their own trucks, tractors and other equipment for forestry and silvicultural operations and pest and disease control. Petrol-driven saws are used in liberation cutting. All the work, whether in the forest or the workshop, is performed by full-time employees.

All engineers and technicians, as well as rangers, foresters, guards and maintenance personnel are allowed a plot of land and a small pasture for their own use free of charge, over and above their normal wages. They are supplied with timber and granted long-term credits for the construction of their own houses. They also have paid leave and free medical treatment and educational facilities.

Skilled foresters and rangers are trained in special forestry schools, and there are technical institutes for foresters. Engineers are trained at the Byelorussian Forestry Institute. Scientific studies are carried on in the Scientific and Research Institute for Forestry and in the Byelorussian Forestry Institute, whose investigations are of considerable assistance in tackling the problems facing the industry. The courses at all these educational establishments are free and students receive full maintenance from the Government. In addition workers, specialists and engineers can constantly improve their professional skills by attending the seminars and courses organised by the Central Forestry Administration, the provincial forestry administrations and the forestry organisations.

The current seven-year plan, with which progress is already being made, provides for substantial expansion and improvement in the forestry industry of the Republic. The forest area will increase by 10.6 per cent. between 1959 and 1965; 516,000 hectares of marshlands will be reclaimed; improvement cuts will increase by 23 per cent. ; and renewal cutting will provide 2.5 million cubic metres of timber. The Government has allocated 26 million roubles for fire-prevention measures alone. The forestry organisations will receive new and improved machinery and equipment, which is

expected to make for lighter work, increased productivity and higher earnings.

REHABILITATION OF THE INDUSTRY AFTER THE SECOND WORLD WAR

The forestry industry in Byelorussia was progressively reconstructed as the Nazi invaders were driven from the territory. Some of the timber undertakings were already at work again by the first quarter of 1944 and within the next two years all the undertakings had resumed their operations. In 1945 they had only 300 trucks between them, and only 12 per cent. of the locomotives and 27.2 per cent. of the narrow-gauge rolling stock they had had in 1940. In spite of the difficult situation caused by war devastation, the woodmen, technicians and engineers made a remarkable effort to put the industry on its feet again and to meet the country's demand for timber.

During this period of reconstruction timber was particularly in demand as a basic building material. The timber undertakings had not enough equipment and manpower to meet the requirements of the economy; as a result seasonal workers from the towns had to be hired for felling and hauling operations, and hauling facilities had to be borrowed from the collective farms. Provision was therefore made in the post-war five-year plan for the reconstruction and development of the economy of the Byelorussian S.S.R. (1946-50) to mechanise 50 per cent. of labour-consuming operations in felling, 25 per cent. in skidding and 60 per cent. in hauling.

The success of the first post-war five-year plan and the rapid growth of heavy industry enabled the timber undertakings to re-equip with the latest machinery, including mobile generators, electric power-saws, skidding tractors and winches, trucks, and both steam and diesel locomotives. In this way it has been possible to mechanise the heavy operations of felling, crosscutting, skidding and loading. The volume of timber felled and hauled in 1950 by the undertakings' own resources was nearly two-and-a-half times greater than in 1940, and the mechanical handling of such operations had increased 2.8 times. Mechanised felling and skidding represented an entirely new departure, completely unknown before 1940. These advances have made working conditions easier and enabled productivity to be increased. In 1950 output per worker was one-and-a-half times higher than in 1940.

The most modern technical equipment was again supplied to the forestry industry during the second five-year plan (1951-55). Perfected high-frequency generators and more powerful skidding tractors and trucks were widely introduced. This enabled the

forestry industry to face up to the increased demand for sawlogs and veneer. Output of building materials was also stepped up and furniture production increased nearly threefold. The planned target for the period 1951-55 was exceeded by 2,930,600 cubic metres of timber, including 86,300 cubic metres of sawlogs above the target figure.

With the introduction of new techniques and working methods and the reorganisation of labour during the post-war years, basic logging operations were further mechanised. The proportion of mechanical felling more than doubled during the second post-war five-year plan, and mechanical hauling more than tripled. Productivity of both labour and machinery was considerably increased. The output per worker in 1955 was 25 per cent. higher than in 1950.

The degree of mechanisation continues to rise every year. In 1959, 90 per cent. of felling operations were mechanised, 76.2 per cent. of skidding and 88.4 per cent. of hauling. The seven-year plan for the period 1959-65 provides for further mechanisation with an anticipated 30 per cent. increase in labour productivity as compared with 1958.

The wide variety of machines used in timber operations includes the Soviet-built petrol-operated "druzhba" saw. Petrol-driven saws have been found more efficient and economic than electrically operated varieties. Skidding is carried out with the TDT-40 tractor, of Byelorussian design. This is a highly manoeuvrable machine with special equipment for mechanical handling and loading of bundles of logs on the tractor platform. The TL-4 and TL-5 winches, also nationally produced, are used for skidding in marshlands. Particularly powerful trucks designed and constructed in Byelorussia are used for hauling. Narrow-gauge railways are also used in some cases.

STABILISATION OF THE FORESTRY LABOUR FORCE

Thanks to this mechanisation it has been possible to dispense with seasonal labour, and undertakings now work the whole year round. But in order to do so they have had to build up a stable force of skilled workers and to train specialists and engineers capable of coping with the difficult problems involved in running highly mechanised undertakings.

Timber production is classified as a branch of Byelorussia's extractive industry, with its own complex system of production. Its distinguishing feature is that the work of felling and hauling has to be carried out in the conditions imposed by nature. Most operations have to be mobile, since both men and machines must be transferred from one site to the next as work progresses. Hence

there is no way of protecting production against outside factors, and the work is frequently affected by the weather and the particular conditions of the soil.

These special features of the timber industry have their effect on the problem of retaining permanent skilled manpower. It has been found in practice that to establish such a working force it is indispensable to provide adequate housing and general welfare and social facilities, including proper conditions at logging camps.

Housing

The Government has allocated substantial sums for this purpose, and housing and communal social facilities have been provided on a very wide scale. From 1952 to 1958 a total of 25 million roubles was spent under this heading, and 27,000 square metres of housing space was constructed. In addition many workers and salaried employees built their own homes with a total area of 51,000 square metres, with the help of government loans of 7,000 to 10,000 roubles, repayable over a period of five to seven years. Schools, colleges, kindergartens and nurseries, communal baths, clinics, shops and stores ensuring regular supplies of groceries and consumer goods for employees have also been built in large numbers in the vicinity of timber undertakings. An extensive network of public catering establishments has been set up, and hot meals are served at workplaces.

Conditions of Work

In 1951 the Government established new scales of payment for timber workers representing an average increase of 33 to 35 per cent. A system of piece rates was adopted so as to relate remuneration more directly with output. Rates are based on the number of cubic metres of timber felled, skidded or supplied to the depot. To these basic rates progressive bonuses are added as follows: a worker who produces the standard fortnightly output receives an additional 20 per cent. of the standard wage for that period; any production beyond this level is paid at a 50 per cent. premium.

In 1959 the annual plan for timber production in Byelorussia was exceeded by 8.4 per cent. This means that on the average each worker exceeded the target figure by the same percentage. To give an example, a skidding-tractor driver earning a standard daily rate of 32 roubles was also paid 20 per cent., or 6.40 roubles, for producing the target output, plus a rate increased by 50 per cent. for the 8.4 per cent. produced above the target level. This amounts to a daily total of 42 roubles.

Thus the progressive piece rate has the advantage of encouraging the workers to surpass the target figures and to raise productivity.

In order to retain regular workers and attract specialists and engineers to timber undertakings, the Government has provided particularly favourable conditions for the industry. Manual workers, specialists and engineers and the few salaried employees have a month's paid leave a year, which is longer than in other branches of industry. Every three years they also have an additional paid leave of one month. During leave they draw their average monthly earnings.

Special long-service bonuses are also paid in forestry. These depend on the period of employment in the industry and are paid once a year, the rate varying from 10 to 30 per cent. of the annual wage.

Social Security

All workers in Byelorussia and their dependants are protected by social security. This comprises a state system of coverage in the contingencies of old age, invalidity, sickness and death of breadwinner, the basic principles of which are laid down in the Constitution. Protection is comprehensive, but mainly takes the form of pensions and other benefits. Pension insurance covers all employed persons without exception, irrespective of the place or type of work, sex, age, nationality or faith. The cost of the scheme is borne entirely by the State and workers are not required to pay any contribution. The pension rate depends on previous earnings. The qualifying age for men engaged in normal conditions of work is 60 (55 for women), but special provisions apply to persons engaged in underground work or in dangerous or unhealthy occupations.

In certain cases these special provisions apply to workers in the forestry industry; for example the pensionable age is 55 for men and 50 for women for skidding-winch operators, locomotive drivers and assistants, crane drivers, loading-platform workers, skidding-tractor drivers, limbers, workers using petrol-driven and electric power-saws and their assistants, truck drivers and generator technicians and their assistants. Foremen and supervisors are also entitled to special pension advantages.

Old-age pensions are payable irrespective of state of health or capacity for work. The rates vary from 50 to 100 per cent. of wages. A worker whose wage was 350 roubles will receive a 100 per cent. pension. For wages of 1,000 roubles and above the pension rate stands at 50 to 55 per cent. of wages. There are also various pension supplements. A worker who was employed for an uninterrupted period of over 15 years is entitled to a supplement equivalent to 10 per cent. of the basic pension. The same supplement is payable to workers who were not employed for an unbroken period of 15 years but worked for ten years in excess of the basic qualifying period.

Workers engaged in felling, limbing, collection and burning of slash, preparation of sites for felling, skidding, hauling, loading, unloading, stacking and sorting and in the construction or maintenance of skidways and logging roads are issued with special clothing and footwear free of charge by the Government.

Merit Awards

In order to encourage workers of outstanding distinction the order of "Honoured Forestry Worker" is awarded to workers who have been engaged for not less than three years in the basic operations of felling, skidding or hauling and have maintained a particularly high output, exceeding their target for an uninterrupted period of not less than two years, or who have made an outstanding contribution to working methods or techniques. It is granted by decree of the National Economic Council with the approval of the Byelorussia Trade Union Council. Persons honoured in this manner receive a medal and a cash sum equivalent to one month's wages.

Occupational Safety

Forestry workers are protected by special safety legislation which imposes severe administrative and judicial sanctions in the case of infractions. Occupational safety is one of the most important duties of managers of forestry undertakings, who are personally answerable for the observance of safety provisions. In Byelorussia great importance is attached to the mechanisation of labour-consuming and heavy operations and to occupational safety. Every year the Government provides large sums for the purpose. From 1957 to 1959 over 2 million roubles was spent on occupational safety measures in forestry undertakings, the annual figure rising from 550,000 to 887,000 roubles.

The central committee of the forestry, timber and paper workers' trade union ensures regular supervision of safety practices in undertakings through its basic organisations and has issued special safety rules. These constitute a general code of safe practice for woodmen. The head engineers of undertakings are personally responsible for the safety of those under their orders in all sections, as well as for ensuring that equipment conforms to safety requirements.

The Soviet Government and the trade unions devote great attention to ensuring that the highest standard of safety is maintained and that working conditions are healthy and conducive to production. The widest range of scientific and technological equipment is utilised in order to achieve this end. Technical inspectors from the trade union organisations are responsible for supervising safety measures and enforcing the relevant legislation.

Medical Care

Attached to the timber undertakings there is a network of medical institutions providing free care. In accordance with a special government decision, the health insurance authorities are required to provide medical facilities for workers in the forestry industry and to improve and extend them constantly. Thus, in timber workers' communities medical institutions have been organised on the following scale :

Number of inhabitants

Less than 300 . .	A dispensary with obstetrical facilities and one medical assistant
300 to 800 . .	A dispensary with obstetrical facilities and two medical assistants
800 to 2,000 . .	A hospital with ten to 25 beds
2,000 to 10,000 . .	A hospital with 35 to 50 beds

Forestry workers living in towns are entitled to the free medical facilities available to all sectors of the population.

Welfare

Estates housing forestry workers are fully electrified and wired for radio. For the workers' entertainment in their leisure time they have clubs with libraries, indoor games facilities, radios and, where reception permits, television sets. Artistic groups are formed and their performances are very popular among the workers.

The local trade union organisations ensure that undertakings comply with requirements concerning the provision of housing and cultural facilities, organise holidays for the workers in rest homes, arrange for sanatorium treatment and organise holiday camps for workers' children.

The provision of normal housing and living facilities, combined with this permanent solicitude for the welfare of forestry workers, has attracted large numbers of workers, and made it possible to form a stable working force.

TRAINING OF FORESTRY WORKERS

Skilled Workers

Vocational training is provided by a special school of forestry. Workers are released from their work to attend its courses full time. The school is equipped for practical training, as it has the latest machinery such as tractors, trucks, winches, power-saws and generators.

From 1946 to 1959 the school trained over 6,000 workers to use tractors, winches, trucks, cranes and saws, and as mechanics, electricians, etc. The length of courses depends on the occupation: mobile-generator mechanics require eight months' training, tractor drivers four months, winch operators six months, truck drivers six months, crane drivers four months and operators of petrol-driven saws three months. The trainees sent to the school by undertakings are workers with no special qualifications but who have had at least seven to ten years' normal education.

The State bears the whole cost of the trainees' education as well as their keep. Throughout the course the trainees continue to draw their previous average wages, and those with families to support are also paid a daily allowance to cover their increased expenses away from home. Trainees are either housed free of charge or are reimbursed for their lodging expenses.

At the end of their theoretical course, trainees undergo a period of practical instruction in an undertaking. Here they are initiated into modern mechanical techniques under the supervision of experienced and highly skilled workers. These practical exercises last from one to two months, and it is only then that pupils have sufficient training to be granted a diploma authorising them to use the machinery in question.

Apart from these full-time courses given by the school of forestry, training on the job is organised in all undertakings. Special courses are drawn up and workers with no particular qualifications are assigned to the supervision of skilled workers either individually or in groups. The courses include demonstrations of the use of various machines, technical instruction, a grounding in safety techniques and practical experience of the machines concerned. Theoretical instruction is also given by the undertaking's engineers and technicians outside normal working hours, whereas practical training takes place during the working day. Needless to say the two phases of training are closely co-ordinated.

Those of the trainees who work in teams are paid either on the basis of the work they actually do in the team or, temporarily, at the daily rate for first category workers. Instructors receive supplements to their normal wages on the scale shown in table II.

These supplements are paid in the form of a lump sum after the examination given to trainees at the end of the prescribed course. Examinations are conducted by qualified committees appointed by the undertaking. Those who pass receive a diploma. Training in undertakings is generally limited to the less complex jobs, such as electric-saw operators, chokermen, limbers and loaders. Great importance is attached to further training facilities in undertakings, and special monthly bonus rates have been estab-

TABLE II. MAXIMUM SUPPLEMENTS PAID TO INSTRUCTORS
IN UNDERTAKINGS
(Roubles per month and per trainee)

Type of training	Number of trainees under instruction			
	One	Two	Three	Four or more
Training of skilled workers . .	70	50	40	35
Further training or training in a second occupation	45	30	25	20

lished to encourage workers to increase their qualifications (see table III).

TABLE III. SCALE OF BONUSES FOR WORKERS WITH DIPLOMAS
OF FURTHER TRAINING
(Roubles per month)

Occupation	Second category workers	First category workers
Tractor drivers and haulage men	Promoted to next grade	125
Drivers, mobile-generator mechanics and skidding-tractor drivers	75	125
Crane drivers, locomotive drivers and winch operators	50	100

Thanks to this training system it has been possible to staff timber undertakings with skilled workers and by 1957 they were employing only their own permanent labour force and no longer needed to make use of seasonal workers or outside haulage facilities. This has also led to a more rational use of machinery and equipment with a consequent increase in productivity, which was up by 4.9 per cent. in 1957, 9.6 per cent. in 1958 and 20.4 per cent. in 1959 by comparison with the 1956 level.

Engineers and Technicians

The wide range of equipment and the existence of a regular skilled working force called for a corresponding rise in the technical level of management, and hence for better-qualified engineers and technicians. Hitherto engineering posts had generally been filled by persons with wide practical experience but without the technical

training that was necessary to run undertakings equipped with the latest machinery. The ranks of technical management had to be strengthened and for this purpose trained forestry specialists were directed to the undertakings.

Before the Revolution there was not one intermediate educational establishment specialising in the training of timber experts in the whole of Byelorussia, let alone a higher institute. In 1919 a faculty was opened under the national agricultural institute (now the Byelorussian Agricultural Academy) for provision of advanced forestry training. In 1930 the Byelorussian Forestry Institute was set up within this faculty in order to train engineers and experts in silviculture and mechanised felling, transport and processing. There are also two technical colleges providing specialist intermediate-level training in forestry.

Tuition at both the Institute and the technical colleges, as at all educational establishments in Byelorussia, is provided free of charge. Students bear no part of the financial cost of their education and are also entitled to monthly education allowances and communal lodging facilities.

In addition to these full-time training courses attended by senior and medium-level staff detached from undertakings there is also a widespread system of evening and correspondence courses followed by workers outside working hours.

Over 1,000 forestry workers take correspondence courses at both the advanced and intermediate levels. Special measures have been taken by the Government to encourage such studies. These include—

(1) Paid leave in addition to regular annual leave : (a) during laboratory work, tests and examinations, 30 calendar days per year for the first and second courses ; (b) during laboratory work, tests and examinations, 40 calendar days per year for the third and subsequent courses ; (c) for the period of state examinations, 30 calendar days ; (d) for the period of preparation and exposition of a diploma thesis, four months for students at the advanced level, and two months for those at the intermediate level.

(2) Provision of one free day per week, at half the normal rate of pay, for students at the advanced and intermediate levels, for a period of ten academic months before submitting a diploma thesis or taking a state examination. In addition, heads of undertakings may grant an extra one or two days' unpaid leave per week during the same period, at the student's request.

(3) The undertaking pays half the student's expenses for travelling to and from the place of instruction.

(4) On the recommendation of the educational establishment, students in the final stages of their courses may also be granted a month's unpaid leave, during which they receive a government education allowance.

(5) Students are granted ten to 15 days' leave to take entrance examinations to educational establishments.

The realistic way in which the above provisions are conceived has had a considerable effect on the level of practical and theoretical training of specialists.

There are at present over 3,000 persons with advanced and intermediate specialist qualifications in timber undertakings. Persons with advanced qualifications work as directors and principal engineers of undertakings, heads and deputy heads of logging sections, heads of transport sections, engineers, foresters and silviculturists. Most of those who go through a technical college work as supervisors and foremen and then progress, as they acquire practical experience, to become heads or deputy heads of logging sections, despatch managers, heads of transport sections and so on.

The contribution of skilled engineers and specialists has helped to improve the technical management of undertakings, and to increase the general level of efficiency.

TECHNICAL PROGRESS AND THE ORGANISATION OF WORK

Thanks to the provision of the latest technical equipment, to the formation of a regular working force and to the influx of trained engineers and specialists, it has been possible to apply technological innovations to logging operations and to improve the organisation of work.

For example skidding before limbing and whole-log hauling are now becoming the general practice. The proportion of unlimbed trees skidded rose from 55.5 per cent. in 1958 to 68.2 per cent. in 1959. Hauling of whole logs represented 24.7 per cent. of the mechanically handled total in 1958 and 28.4 per cent. in 1959. Where trees are hauled unlimbed, the branches are lopped, collected and burned at the depot, which makes for considerably easier operation and increases productivity as compared with limbing at the felling site. Hauling of uncut logs to the depot makes for rational operation in sorting and saves manpower in unloading, sorting and stacking.

Organisation of logging work has also been improved. Formerly, individuals or whole gangs of workers would specialise in a particular operation. Since the end of 1957 they have been progressively replaced by all-round teams of six to ten workers with different qualifications. In general, their work centres around one skidding

machine, either a tractor or a winch. The team carries out the whole range of logging jobs from felling to stacking at the depot or loading on trucks, depending on the particular procedure used in the section. Payment is based on the quantity delivered, which means that the teams have an incentive to increase output in all phases of the process.

The team built around one skidding machine is made up in such a way that it can carry out all the basic logging jobs. The number of workers of each type is based on the daily capacity of the machine and the standard output per man-day in the different jobs making up the work of a team. This ensures complete co-ordination all along the line and encourages higher output while keeping down the size of the team, thus encouraging increased productivity. Teamwork of this sort has become the most widespread form of work organisation.

The remuneration of all-round teams is based on output. A composite rate representing the combined total of the rates for the different operations is established per cubic metre of timber stacked at the depot or loaded on to the truck.

Output norms are determined in accordance with the average volume and type of trees at the felling site. The average volume of standing trees is determined before felling operations begin by dividing the total volume of all types by the number of trees. When this has been done an individual norm is set up for each operation (felling, skidding, trimming, lopping, collecting and burning branches, etc.).

The earnings of each member of a team are calculated in accordance with the wage rate for his basic job, or by applying a coefficient for each member and making allowance for the number of hours worked. These coefficients take account of qualifications, productivity, machines used and the work done, and are established by the head of the logging section, in consultation with the foreman and subject to agreement by team members.

It has been found in practice that the organisation of small all-round teams paid on the basis of their final output in accordance with output norms and composite rates is highly efficient. It cuts down or even entirely eliminates idle time between operations for both men and machines. The members of the teams can pool their skills and their efforts. For example the tree fellers help the chokermen and limbers, the chokermen also help the limbers, and the tractor drivers help the chokermen. With this pooling of skills and effort it would be impossible to calculate a fair remuneration for each member of a team without the use of a system of coefficients.

The small all-round teams have every interest in fulfilling or over-fulfilling their work targets, and both the quality of work and their earnings are higher. The system has proved to be the most suitable in the present conditions of the Byelorussian forestry industry. In 1959 productivity rose by 16.2 per cent. over 1957 and by 9.7 per cent. over 1958.

Every year sees new techniques introduced into the forestry industry, which has rapidly become a highly mechanised, year-round occupation.

THE TUROV TIMBER UNDERTAKING

The work of the industry can best be illustrated by the example of a specific timber undertaking: the Turov undertaking. Its official duties comprise felling, skidding, hauling and cutting operations in accordance with the state plan for the supply of national requirements.

It is an economic unit with its own budget. The director acts by delegation of authority from above.

The Turov timber undertaking, which was organised in 1947, has the following different sections:

(a) Three logging sections, comprising 12 divisions, each under the orders of a foreman and responsible for felling, hauling and loading on narrow-gauge railway trucks.

(b) A depot where timber is unloaded from railway trucks, logs are cross-cut to the required sizes, sorted, stacked and handed over to the floating undertaking for ultimate delivery.

(c) A narrow-gauge railway system, for transport of timber from the operational divisions to the depot. Tracks are 750 mm. in gauge for steam locomotives, and the total length is 118 km., including 36 km. of main line, 44 km. of branch line and 38 km. of sidings.

(d) A maintenance shop responsible for current maintenance and periodical overhaul of all machinery.

(e) A communal housing office which builds, maintains and repairs housing and communal and cultural facilities.

(f) A sawmill which supplies the undertaking with sawlogs and building materials for construction and repair of housing and communal and cultural facilities.

The forest stand is situated in two administrative regions and represents a compact forested area suitable for access by narrow-gauge railway. Some 40 per cent. of the forest stand is in marsh-land. The major types are pine, oak and birch. The average volume

of trunks is 0.37 cubic metres, the average volume per hectare 161 cubic metres and the average volume of a felling site 1,640 cubic metres. The yield of marketable timber is between 75 and 80 per cent. The forestry regulations applicable are those for forests of the second category.

Table IV contains figures on the quantities of machinery and equipment supplied in recent years.

TABLE IV. MACHINERY AND EQUIPMENT IN THE TUROV TIMBER UNDERTAKING, 1956 TO 1960

Item	Units existing on 1 January				
	1956	1957	1958	1959	1960
Narrow-gauge steam locomotives	5	5	7	7	8
Narrow-gauge diesel locomotives	2	3	3	4	5
Narrow-gauge flat-cars	165	172	180	200	220
Cranes	3	3	5	5	5
Skidding tractors:					
KT-12	32	30	—	—	—
TDT-40	—	10	36	67	67
TL-4 winches	—	—	4	4	8
PES-12-200 generators	20	20	20	20	20
Petrol-driven saws	—	15	30	34	88

From these figures it can be seen how greatly the supply of machinery and equipment has increased, particularly tractors, winches, saws and rolling stock. This has permitted further mechanisation of forestry operations. Table V shows the degree to which various operations had been mechanised by 1959.

TABLE V. DEGREE OF MECHANISATION OF VARIOUS OPERATIONS IN THE TUROV TIMBER UNDERTAKING IN 1959

Operation	Thousands of cubic metres		Percentage of mechanised work to total
	Total	Mechanised	
Felling	308	308	100.0
Skidding	271	234	86.3
Hauling	307	287	90.6
Loading	264	212	80.3

The work of the undertaking proceeds according to a plan. One shift only is used for felling operations, whereas there are two shifts for hauling and for work at the depot. Technological processes are based on complex mechanisation and electrification of the main operations.

Until 1958 the work was done by specialised gangs. This presented the disadvantage that those engaged in felling were not interested in the amount of timber delivered to the depot and in 1958 the system of small all-round teams was introduced, with payment according to the volume loaded on the truck. The undertaking has now gone over entirely to this method, with an improvement in efficiency and output per shift, since there are no idle periods of waiting for timber to come through. The adoption of the all-round team system and the introduction of new machinery have ensured a new rhythm of work with outstanding results.

The establishment of a stable labour force has been of capital importance for the improvement of the undertaking's output. In order to attract the workers it required the undertaking had to offer proper housing and social facilities, and in this it received outside assistance.

At present most of the loggers, engineers, specialists and salaried employees live in three forest estates built with state funds during the last ten years. The undertaking has an area of 9,707 square metres of housing space, in addition to which many employees have built their own houses, assisted by government loans. From 1952 to 1958, 4,500 square metres of individual housing were built in this way.

The three estates contain three schools, three clubs, a hospital, two dispensaries, a kindergarten and a nursery, three restaurants, six stores, radio rediffusion equipment, three libraries and three communal baths. The estates are fully electrified and wired for radio.

The workers' clubs have their artistic circles, which put on performances for fellow workers and local collective farms. The clubs also give film performances and run libraries. These facilities are designed to promote satisfying leisure after the day's work is completed.

Mobile canteens provide hot meals and hot water for the workers at the felling site.

The provision of satisfactory housing and social facilities has made it possible to attract and retain a regular working force within the undertaking. Most of the workers come from rural areas, and the undertaking has successfully dealt with the problem of training them for mechanised occupations.

For purposes of training, workers are either detached and sent for full-time instruction at a forestry technical school or given

instruction in the undertaking individually or in teams. Systematic courses are organised for the improvement of workers' qualifications. The result is demonstrated in the substantial increase in numbers of mechanical specialists from 85 to 200 between the years 1950 and 1959. The undertaking has 44 engineers and technical specialists fully trained in modern methods of work organisation and mechanisation.

Now that it has been mechanised and has a regular working force and a considerable staff of engineers and technicians, the undertaking is competently administered the year round in accordance with the latest techniques and working methods. It now relies exclusively on its own resources and its regular staff to fulfil its production plans.

The regular logging workers, engineers, specialists and salaried employees are paid considerable sums every year in respect of long service and leave. In 1959 a total of 448,000 roubles was paid in long-service allowances, 659,000 roubles for leave and 384,000 roubles for pensions and temporary incapacity benefits. The trade union organisation of the undertaking sent 33 workers to rest homes and sanatoria in 1959, paying 70 per cent. of their expenses. Six workers have been awarded the title of "Honoured Forestry Worker" in acknowledgment of outstanding performance.

CONCLUSION

In a socialist society the labour of every individual, whether he is a wage earner, a salaried employee or a member of a collective farm, contributes to the collective labour of the community. Every worker works for society and benefits from the results of this work. The social significance of labour in a socialist society also affects the workers' attitude towards production; the knowledge that every active person is working for himself, for his people and for his country awakens their zeal and initiative. This productive enthusiasm of the masses is expressed in their extensive development of socialist emulation. Workers' collectives at undertakings compete to increase labour productivity, to get the most out of available machinery, to reduce production costs and to make the best possible use of national resources. Collectives and individual workers who have achieved outstanding results through such emulation are rewarded by cash bonuses.

The seven-year plan for the development of the Byelorussian economy (1959-65) provides for further technical progress in the forestry industry through integrated mechanisation of production. The degree of mechanisation to be attained in the various operations by 1965 is shown in table VI.

TABLE VI. DEGREE OF MECHANISATION TO BE ATTAINED IN FORESTRY OPERATIONS IN BYELORUSSIA UNDER THE SEVEN-YEAR PLAN, 1959-65
(Percentages)

Operation	1958 figure	Planned figure for 1965	Increase during the seven-year plan
Felling	85	100	15
Skidding	60.2	85.0	24.8
Hauling	81.1	95.7	14.6
Loading	57.3	79.5	22.2

Even wider introduction of technical equipment is proposed: TDT-60 skidding tractors, self-propelled skidding winches, perfected hauling tractors, diesel locomotives, petrol-driven saws, petrol-driven limbers, loading machinery and fully mechanised depot equipment, combined with improvement and development of roads and narrow-gauge railways and more advanced methods of labour organisation and production technology.

The further mechanisation of all logging operations will enable even more favourable conditions of work to be provided for employees. There will also be new provisions for the vocational training and retraining of timber workers, specialists and engineers, and research will be continued in the use of the latest perfected labour-saving machinery with a higher productivity ratio. Further mechanisation will be accompanied by increased remuneration and shorter hours of work.

The seven-hour working day was introduced for forestry workers in the second half of 1960. On days preceding public holidays the duration of work remains at six hours. The daily pay of a skidding-tractor driver went up by 40 per cent., of an electric-saw operator by 32.8 per cent., of a skidding-winch operator by 54 per cent., of a tree-feller using a petrol-driven saw by 40 per cent. and of a limber by 20.5 per cent.

This remuneration system combined with the seven-hour working day is devised to promote collective incentives for the team and for the logging camp in fulfilling monthly production targets. A bonus is payable for meeting the average monthly norm, equivalent to a sum up to 20 per cent. of monthly earnings of the individual worker. For each percentage point by which the norm is exceeded a further bonus of up to 2 per cent. of monthly earnings is payable.

The complex mechanisation of production processes in the forestry industry, the introduction of advanced methods of work, the reduction of hours of work, the improvement of conditions of work and communal facilities and the improvement of workers' material welfare and cultural standards will enable the forestry industry to achieve a new high level of productive development within a short time, thereby contributing to the further progress of the national economy.
