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Demo-Social Typologies. Standard Stock of Demo-Economic Resources

Starting from the present tasks of human resources, the study examines certain variables expressing the connections between the demographic subsystems (the young population, the demo-economic population and the full age population) as well as those within the demoeconomic resources, trying to quantify them through a group of socio-economic levers.

Based on the study of international trends, the work further presents certain typologies of sectorial structures (primary, secondary and tertiary sectors) and on groups of countries according to their development standard (under-developed, developing and developed countries). Related to these typologies and for ensuring the comparability of the data on the demo-economic resources on sectors, especially between the primary and secondary sectors (industry-agriculture), a new synthetic lever is suggested, called standard stock of demo-economic resources also comprising the main qualitative aspects of the labour resources, the structure on their age groups and the level of training.

DEMO-SOCIAL TYPOLOGIES; VARIABLES AND CONNECTIONS

The problem of demo-social typologies, of the connections between them and of improving the methods for the quantification of labour resources, of the role and efficiency of the demographic investments is having a growing importance, at present.

Within the general development strategy and of its tactical lines, new, complex problems of connections and interdependences can be outlined between the economic development, the dimension and structure of human resources. The problem of human resources can no longer be thought out

isolatedly and the more so designed outside the economic structures, the two sides being integrated into a process of interaction and constant modelling. Taking into account the targets of the Romanian economy in a near future and taking into consideration the less favourable demographic situation due to a relative decrease of the demographic contingents which are to enter production in the next five year plan, one of the essential problems is to know and to identify the reserves and to make full use of the manpower of the society. This is also the reason why the carrying out of the big objectives of the next 1981—1985 five-year plan, the ensurance of the material and spiritual progress in which the country is involved depend, to a decisive extent, on the demoeconomic resources, on their structure, on staff training on the rational use of labour resources, an integral part of the general strategy for the progress of the entire society. Naturally, this requires a new outlook in estimating human resources, their structure and dynamic character, the connections between some demographic and demo-social subsystems, the cost of human training and a reconsideration of the category of demoeconomic resources in keeping with the demands of the development and improvement of human personality.

The demo-social and socio-professional groups in the Socialist Republic of Romania are suggestively presented in Fig. 1.

Group **A**: *The young population* aged between 0 and 15, with its two subsystems, the pre-school contingents aged 0—6 the and school contingents of age between 6 and 15.

Group **B**: *The demo-economic population* or demo-economic resources comprising the population biologically and economically considered as work-aged. According to our legislation, these age limits are differentiated on groups of age, sex and social sectors. Generally, for the working staff, these limits are between 16 and 60 (62) years for men and 16—55 (57) for women. For cooperative and individual peasants, these limits are considered in our country to be between 16 and 65 years for men and 16—60 years for women. The higher age limits are also considered a pensioning limit for the entire population. Within this typology, we can also identify a group of school age comprised between 16 and 24, of great significance in understanding the essence of the problem which will be further analysed.

Group **C**: *The full age population* or the pensioning population comprised above the higher limits of the demo-economic resources. Within typology B which is most important from the economic point of view, we distinguish: a) the population able to work representing the work-aged population from which we subtract the population unfit for work (invalids of grade I and II); b) The available or potential active population comprising the population able to work from which the domestic population with a lower grade of occupation is subtracted; c) The occupied active population representing the occupied population, not including the staff undergoing training — pupils and students as well as militaries in service; d) The occupied civilian population; e) and, naturally the human resources occupied in the branches of material production and in services. A number of direct and feed-back relations and connections, some of them of a dynamic mobility and large prospects are established among the three typologies (**A B C**) and within them especially as regards the demo-economic resources. These connections can be

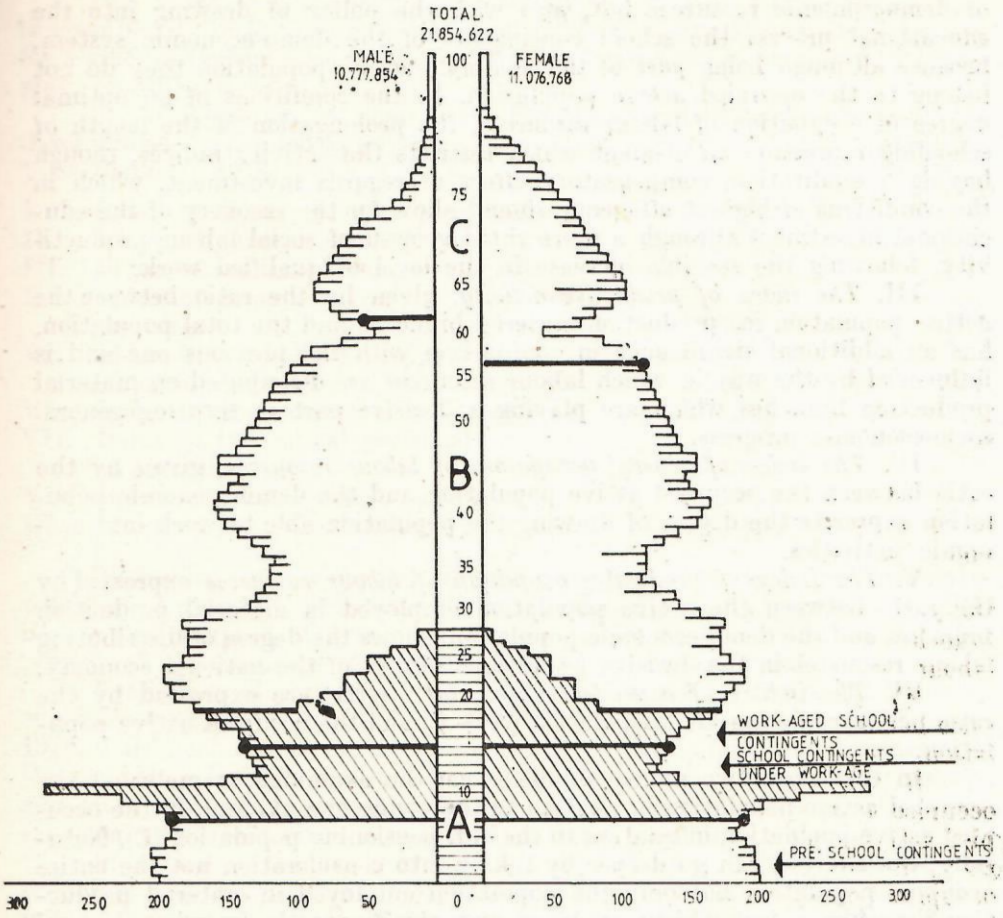

Fig. 1

expressed by a number of variables of high socio-economic significance in the analysis and orientation of the socio-economic model of human resources.

I. *The index of demo-economic potential* is given by the ratio between demo-economic population and total population, and expresses the productive human potential of the nation and which must be situated within certain optimal limits for maintaining the equilibrium between the population able to produce (**B**) and the consumer population (**A** + **B** + **C**). The dimension of this variable is mainly given of course by the model of the demographic structures, by the way in which the birth-rate and span of life of the population is developing

II. *The index of general activity* given by the ratio between the occupied active population and total population, showing the degree of general use of the productive human potential of the country. The significance of this index must be related not only to the demographic structure and the structure

of demoeconomic resources but, also with the policy of drawing into the educational process the school contingents of the demo-economic system, because although being part of the available active population they do not belong to the occupied active population. In the conditions of an optimal degree of occupation of labour resources, the prolongation of the length of schooling represents an element which restricts the activity indices, though having a qualitative, compensatory effect as regards investment, which in the conditions of highest efficiency should allow for the recovery of the educational investment through a more rapid growth of social labour productivity, following the sensible increase in the level of qualified work.

III. *The index of productive activity*, given by the ratio between the active population in production material branches and the total population, has an additional significance in comparison with the previous one and is influenced by the way in which labour resources are distributed on material production branches which are playing a decisive part in securing general socio-economic progress.

IV. *The index of general occupation of labour resources*, given by the ratio between the occupied active population and the demo-economic population expresses the degree of drawing the population able to work into economic activities.

V. *The index of productive ocupation of labour resources* expressed by the ratio between the active population employed in material production branches and the demo-economic population, shows the degree of distributing labour resources in the decisive productive sectors of the national economy.

VI. *The indices of dependence of social targets* are expressed by the ratio between the inactive population (**A** + **C**) and the occupied active population.

In this case, two more subindices can be examined, namely: a) the occupied active population in relation to the young one (**A**) and, b) the occupied active population in relation to the old, pensioning population (**C**). Naturally, the analysis can go deeper by taking into consideration not the entire occupied population but only the population employed in material production branches, a fact which can be of high significance in knowing the real equilibrium between those who are effectively working and those consuming in a certain period of time.

VII. *The index of theoretical potential of schooling* is given by the school-aged population (6—24 years) and the total population.

VIII. *The index of general school activity* is given by the ratio between the effective school population and the total population, expressing the effort to attract and involve the school contingents in relation to total human resources.

IX. *The index of general schooling* is given by the effective school population and the school-aged population (6—24 years).

This variable is acquiring a much more real sense when the grade of involving of the population in schools is analysed on years and on groups of school age.

X. *The index of school activity of the demo-economic resources* is given by the ratio between the effective school population of the demo-economic age and the demo-economic population.

This index is extremely important in the present stage and reflects the complexity of the processes for a qualitative raising of human resources, for a gradual replacement of physical by intellectual work, of simple by complex, qualified work.

In the following, we shall exemplify the global dimension of some of these indices for Romania, according to estimates published in the Statistical Year Book for 1978.

I.	Index of demo-economic potential	= 59.08%
II.	Index of general activity	= 47.08%
III.	Index of material production activity	= 40.71%
IV.	Index of general ocupation of labour resources	= 79.69%
V.	Index of productive occupation of labour resources	= 68.91%
VI.	Index of dependence of social targets	= 112.3%
VII.	Index of theoretical potential of schooling	= 30.66%
VIII.	Index of general school activity	= 22.11%
IX.	Index of general schooling	= 72.1%

By making a bird's eyeview, it can be estimated that the demo-economic potential of over 59% is favourable to us, characterizing a generally equilibrated demographic structure, with some oscillations to occur in certain periods of time because of the configuration of the age pyramid.

The indices of activity in our country, being part of the world tendencies have decreased from 51.4% in 1950 to 48.1% in 1973 and to 47.08% in 1978. This tendency is explained by the joint effect first and foremost of the "school explosion", of the increased duration of education in our country and of the process of demographic ageing, of the prolongation of the average span of life following the raising of the living standards of the population.

In estimating the future evolution of the indices of activity of the demo-economic resources, at least two factors will continue to exercise a certain influence as regards the limited tendency of descrease due to: a) the increase of the school contingents of the groups able to work through the generalization of ten-year and, afterwards of 12—year education and through the expansion of higher education in keeping with the new demands of the economy; b) the increase of the average span of life of the population, due to the process of change in the structure of the age groups and the relatively constant maintenance of the average span of life. The index of general school activity (the degree of involving in schools of the population) was of 22.11% in 1978, and will amount to 27% by the end of the 1981—1985 Five -Year Plan.

Professional structure of the school contingents in 1978 year is presented in Fig. 2.

The relative decrease in the activity indices is connected with the technical progress which requires a still more complex labour with a highly qualified standard and it plies on the expansion of education and on the prolongation of the schooling period, narrowing the length of production work-time in the active life period. At the same time, the demographic structures influenced by the phenomena of demographic ageing (extending group C of the pension-

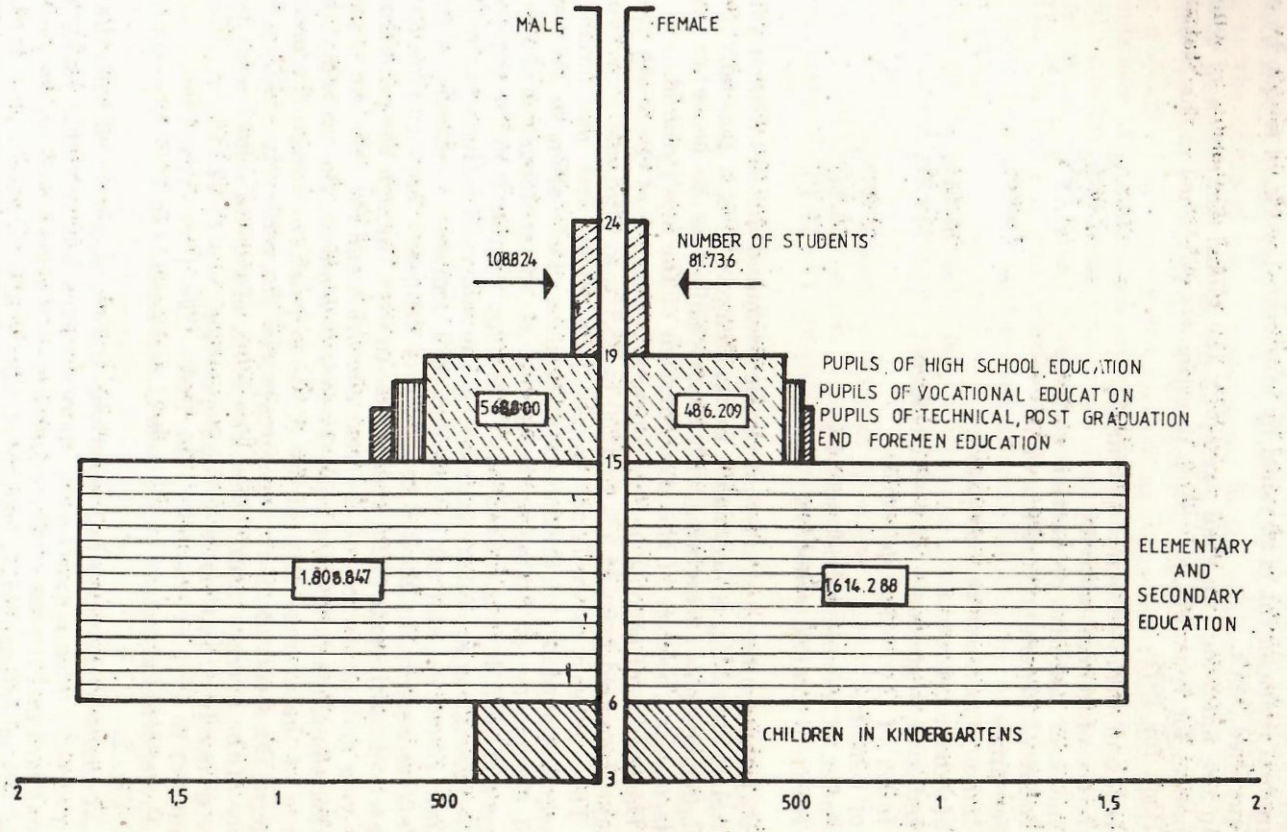
MALE
FEMALE
24
19
15
6
3
NUMBER OF STUDENTS
81.736
108824
PUPILS OF HIGH SCHOOL EDUCATION
PUPILS OF VOCATIONAL EDUCATION
PUPILS OF TECHNICAL, POST GRADUATION
END FOREMEN EDUCATION
486.209
1.808.847
1.614.288
ELEMENTARY
AND
SECONDARY
EDUCATION
CHILDREN IN KINDERGARTENS
2
1,5
1
500
500
1
1,5
2

Fig. 2

ing population) and of demographic rejuvenation (extending group A of the young population) can create in certain limits a tense relation between the employed and the maintained population. From the economic point of view, the decrease of the activity indices in the conditions of the maintenance, at an optimum level, of the degree of occupation of the population is, indirectly, an investment which is to be recovered by an increase in the social labour productivity which should compensate the growth of the social targets for the maintenance of the population being trained and of the inactive population in general.

SECTORIAL TYPOLOGIES; STANDARD STOCK OF DEMO-ECONOMIC RESOURCES

The type of economic growth established in the post-war years and, first and foremost industrial development has brought about changes in the economic structure with direct implications on a new model of distributing labour resources on sectors of the economy, by setting into motion a dynamic, complex process of transferring human resources from traditional branches with a low productivity level to modern branches directly linked with the contemporary technical progress. Following the industrial expansion, there is a marked tendency of decrease of the population employed in agriculture and of increase of the industrial-constructions sector with a more rapid rate in those industrial subbranches which are using labour resources in a complex and multilateral way. Technical progress gives rise to other new processes as regards the distribution of the population on branches and sectors, processes which are not directly linked with industrialization but rather with the complex development of the national economy, with the diversification of human needs in a certain stage of development of civilization, with the raising of the living standard of the population and to some extent, by overusing some structures specific to the market economies.

By taking into account the tendencies deriving from the analysis of development, the following typologies of the relation between the population employed in the primary, secondary and tertiary sectors might be established, on groups of countries, according to their standard of development.

Typologies of the dynamic character of the sectorial structures on groups of countries [3] are shown in Fig. 3

Belonging to the typology of the socialist countries, our country has witnessed a very important qualitative leap in the re-organization of the sectorial demo-economic typologies by a considerable reduction of the agrarian population at the expense of the increase of the population employed in the other, especially industrial activities.

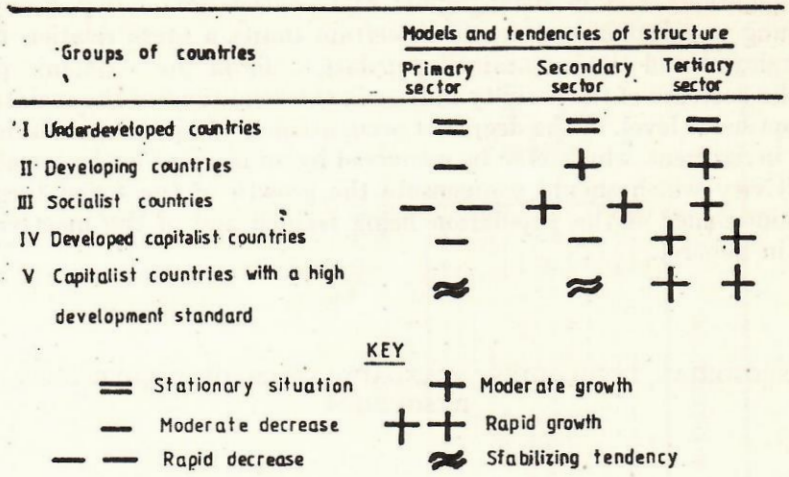

Fig. 3

Table 1

Structure of population employed on branches of the national economy

	1950	1960	1965	1970	1975	1978
Population employed Total of which:	100.0	100.0	100.0	100.0	100.0	100.0
— industry	12.0	15.1	19.2	23.0	30.6	33.5
— constructions	2.2	4.9	6.3	7.8	8.1	9.0
— agriculture	74.1	65.4	56.5	49.1	37.8	32.5

Source: the Statistical Year Book of Socialist Republic of Romania, 1979, pag. 111

Based on the demographic changes in the population on age groups and on the phenomenon known as demographic ageing in general, we witness a new process of demo-economic ageing, extremely marked in the agricultural branch fed by the model of village-town migration of the agricultural population. That is why, in our opinion, a new system of approaching and quantifying human resources is necessary which should include the quantitative and qualitative elements of this process and ensure therefore a compatibility of data both on a national and on international level.

The economic development in the post-war years we have mentioned before, the profound structural transformations in the conditions of the contemporary technical and scientific revolution gives priority not only to the knowing of the quantitative aspect of labour resources but, especially to

the quantification of the qualitative side, as a structure on age groups, level of training, etc.

In the conditions of the formation of the new socio-economic structures, of territorial mobility, new models are established between the active groups on branches, especially between the two basic branches of the national economy: industry and agriculture.

Naturally, there is no question of a model of population structure on groups of age, sex or qualification, absolutely identical in a branch or another, but, rather of a convenient structure in keeping with the specific character of each sector and which should be able to ensure the best turning to account of the material and human resources in each branch. Since in the dynamic process of creation of the new territorial and socio-professional structures they can be, to some extent, unfavourable to the primary sector, namely to agriculture, both as regards structure on groups of young age and qualification, in our opinion, a reconsideration is necessary of the methods of quantifying labour resources in agriculture, making them comparable to the other branches of the national economy (Fig. 4). All this requires a new synthetic index which should allow for the gross, physical series of labour force to be turned into a conventional unit, corrected and adjusted by certain conversion coefficients, numerically expressed in conventional persons, or in conventional work time units. We would call such an index a *standard stock demo-economic resources.* It could be defined as the totality of the physical and intellectual capacity of the demo-economic resources related to an optimal or convenient structure, mainly in keeping with the groups of age and sex, and the level of professional training. From the point of view of the economic calculus, it might be obtained by converting — on the basis of coefficients — the population in keeping with a) the structure on groups of age and sex, b) the level of training; c) the degree of utilization of the time work on branches (industry, agriculture, services, d) the length of active life.

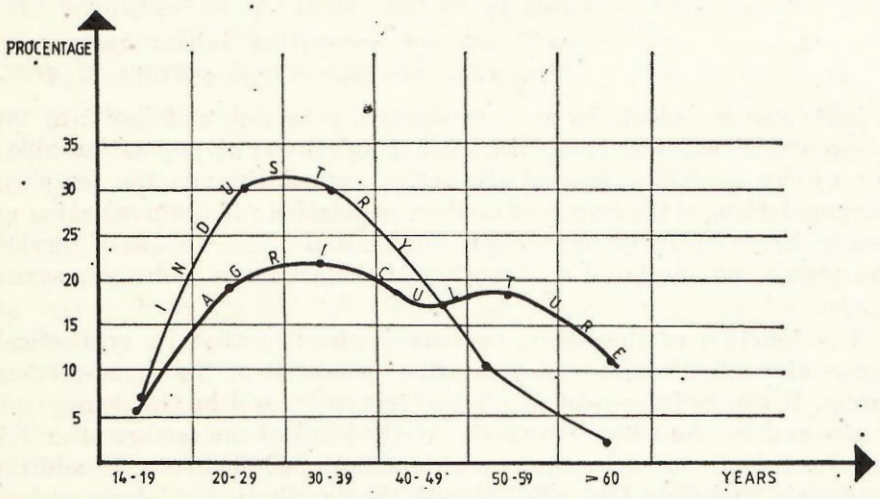

Fig. 4

Legende of Fig. 4: Distribution of population on age groups in industry and agriculture. Source: The population census in 1966.

The criterion of labour productivity is at the basis of the converting coefficients;

i) structure on age groups $k = 1$, productivity at the groups of young age 29—34 years;

ii) the level of training $k' = 1$ of a worker with a medium qualification, with secondary studies;

iii) the use of work time $k'' = 1$, the average length of the time used in non-agricultural activities, as a rule, 290 days.

The calculus of this standard index of demo-economic resources seems more real and more operational, by setting out from two known variables and with quantifying possibilities, namely: a) structure on age groups, in keeping with the productivity of the demo-economic resources and b) the level of training of the population in keeping with the productivity standard.

In this case, this index can be constructed in keeping with relation:

$$S^s_{rm} = \sum_{j=1}^{m} \sum_{i=1}^{n} rmij \cdot \beta_{ij}$$

where:

S^s_{rm}	—	standard stock of labour resources expressed in conventional persons;
$j = 1, 2, ..., m$	—	number of economic or administrative-territorial units included in the calculus;
$i = 1, 2, ..., n$	—	number of the categories of labour resources of category i included in the calculus;
$rmij$	—	dimension of labour resources of category i of area j;
β_{ij}	—	coefficient of converting labour resources of category i in conventional persons of area j.

This index can be calculated as a productive potential, as follows: a) total demo-economic resources (the work-aged population); b) population able to work; c) the available (potential) active population; d) the employed active population; e) the employed civilian population; f) the population employed in the branches of material production and in the sphere of services; g) the population employed on branches of the economy, industry, agriculture, etc.

The function of this index consists in the fact that it synthetically expresses the quantitative and qualitative potential of the demo-economic resources. It can be influenced at a macroeconomic level by the demographic structure and by the education stock. At the level of the sectors of activity it can also be influenced by the two afore-mentioned elements; in addition, an extremely important factor linked with the distribution of labour on branches especially industry-agriculture, can be attached to it. The standard stock of demo-economic resources is correlated for a long time interval with

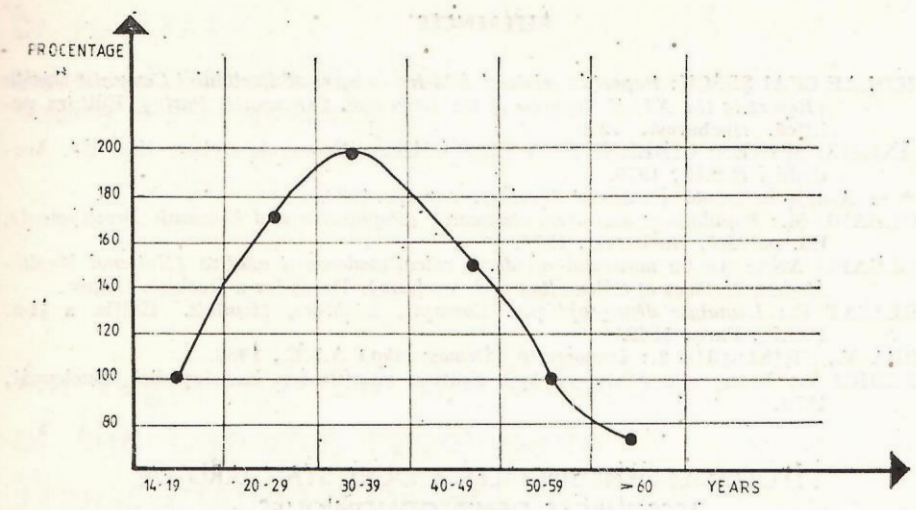

Fig. 5

the demographic indices — birth-rate in the first place, the demographic and educational investments, with the school population and the schooling indices, with the indices of the national revenue and of the social labour productivity.

Anyhow, this index would more really express the rational distribution of labour resources on branches of the economy and the use of work time. It would also allow for the construction of production models and functions of the population on age groups and qualification level on branches of activity which would acquire a rich economic significance.

Labour productivity depending on age group is shown in Fig. 5.

The standard synthetic index of demo-economic resources would more completely and more really characterize the distribution of labour on branches of the economy, especially industry and agriculture and could quantify the potential of labour in agriculture and its real limits to attain the objectives established through the national development plans in which the share of the population in agriculture would go down to 10—15% by the end of the decade. Romania has still reserves of population growth, having a type of relatively precocious feminine fertility. We have a young labour force less aged in comparison with other countries and the national time stock appears as an important reserve of our economic growth. In this context, the role of the human factor and of the demographic investments is growing more and more in maintaining a high rate of economic development, in increasing the education stock, in ensuring a balanced structure of the population on age groups and on branches—especially for agriculture — in training qualified specialists and in raising the cultural standard of the entire people.

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TYPOLOGIES DEMOSOCIALES. STOCKS STANDARD DE RESSOURCES DEMOECONOMIQUES

Prenant pour point de départ les tâches actuelles des ressources humaines on examine certaines variables qui expriment les connexions entre les sous-systèmes démographiques (population jeune, population démoéconomique et population âgée) ainsi que celles de l'intérieur des ressources démoéconomiques, essayant leur quantification par un groupe d'indicateurs socio-économiques.

Dans la suite, étudiant les tendances internationales on présente certaines typologies des structures sectorielles (secteur primaire, secondaire et tertiaire) et par groupe de pays selon leur niveau de développement (pays sous-développés, en voie de développement et avancés). En liaison avec ces typologies et pour assurer la comparabilité de données concernant les ressources démo-économiques par secteurs, surtout entre le secteur primaire et secondaire (industrie-agriculture) on propose un nouvel indicateur synthétique nommé stock standard de ressources démo-économiques et qui contient aussi les aspects qualitatifs principaux des ressources de travail, la structure par groupe d'âge et le degré de qualification.

ДЕМО-СОЦИАЛЬНАЯ ТИПОЛОГИЯ. СТАНДАРТНЫЙ ЗАПАС ДЕМО-ЭКОНОМИЧЕСКИХ РЕСУРСОВ

В работе рассматриваются некоторые переменные, выражающие межсистемные демографические связи (молодое население, демо-экономические население и сторое население) как и внутренные связи демо-экономических ресурсов, с попыткой их числового определения при помощи некоторой группы социо-экономических показателей.

Далее, на основе исследования международных тенденций приведена типология секторных структур (первичный сектор, вторичный сектор и третьий сектор) по группам стран (отсталые, развивающиеся и развитые страны.

Связано с этой типологией и для обеспечения сопоставимости данных, относительных демо-экономических ресурсов по секторам, особено между первичным и вторичны секторами (промышленность — сельское хозяйство), предлогается использование нового синтетизирующего показателя, названного стандартный запас демо-экономических ресурсов, включающий в себя и важнейшие качественные стороны трудовых ресурсов, их структуру по возрастмым группам и степень квалификации.

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