CONTENT

INSTRUCTIONS FOR AUTHORS

Authors wishing to publish papers at JCPP are asked to send their manuscripts electronic at http://jppc.ro/en/index.php/jppc/about/submissions. For publishing a paper, authors must follow the requirements and conditions set forth below.

Who can publish: Papers can be sent by researches, academics and professionals with interests related to socio-economic sciences. The main criteria considered by the reviewers are originality, novelty, potential to spark debate and coherent exposure. Documents submitted for publication will be examined by editors before being placed into the process of review.

Fields of interest: Papers in area of Social Sciences including: General Social Sciences, Sociology and Political Science, Social Sciences (miscellaneous).

Requirements for publishing: The paper must be submitted in **English**, by e-mail, as attached **Word** file in a single document which will include all images and tables. Minimum requirements must be met on the following:

- **Size:** the paper should contain a maximum of 15 pages including biography. 4000-6000 words
- **Paper title:** should be concise and summarize the most appropriate contents of the paper
- **File format:** Microsoft Word
- **Text format:** Times New Roman 12, 1 line spacing, with diacritics if the text is in Romanian
- **Information about the author/ authors (a maximum of 250 words):** for each author it must be mentioned the academic title, current position, institution to which it belongs, contact details – telephone and e-mail. For the selected authors, all this information will be made public. The submission of a manuscript implies that the author certifies that the material is not copyrighted and is not currently under review for another publication. If the article has appeared or will appear in another publication, details of such publication must be disclosed to the editors at the time of submission.
- **Abstract:** will present shortly the purpose, field of application, research methods, results and conclusions of the paper. It should have a maximum of 250 words and will be written in English.
- **Key-words:** are designed to provide a rapid classification of the paper. The key-words must be written in English, separated by semicolon (;) and placed below the abstract.
- **Tables:** as simple as possible, with explanatory titles, numbered in the order they appear in the text. The source of the data must be mentioned below each table (Times New Roman 10, italic, aligned left).
- **Graphs:** should be made in Excel, in black and white and must be inserted and numbered in the order of appearance in the text. Each graph should have an explanatory title and the source of the data should be mentioned below the graph (Times New Roman 10, italic, aligned left).
- **Footnotes:** are inserted in the text and numbered with Arabic numbers. Their size should be reduced by bringing clarification on the text.
- **References:** should be cited as follows: the name of the author, year of the publication and page, all in parentheses (Ritzer and Goodman, 2003, p. 93) or if the name of the author is mentioned within a sentence it should be included as follows: ...Ritzer and Goodman (2003, p. 93). At a first citation containing from three to five authors, all names are mentioned, afterwards, it is used [the first author] "et al.". If more than one paper by the same author, from the same year is cited, the letters a, b, c etc. should included after the year of publication. The citation of a paper available online should be performed following the same rules as for a book or a magazine specifying the electronic address where it was consulted.
- **Bibliography:** the full list of the references cited in the text must be presented at the end of the paper, below annexes, in alphabetical order of the names of the authors and in a chronological order for a group of references by the same author. The order is the following: name of the author/ authors, year of appearance, title, publisher, city; for example:

  Rea, A., Tripier, M. (2008). *Sociologie de l'immigration.* Paris: La Decouverte

  Koh, H. K. (2010). A 2020 vision for healthy people. *New England Journal of Medicine, 362*(18), 1653–1656

The process of review: Papers are reviewed by two specialists. Depending on their recommendations, the editors decide whether publish/ reject the paper or make suggestions for improvement to the author/ authors. The editors have the right to make minor editorial changes to submitted papers, including the correction of grammatical mistakes, punctuation and writing, as well as modify the format of the paper, but no major changes will be performed without the approval of the author. If major changes are needed, the paper is returned to the author for him to make the necessary changes. Authors are informed by e-mail on the status of the papers sent in no more than 6 weeks from their receipt.

Papers accepted for publication are sent to authors for accept printing. Authors are asked to respond to the editorial board within 7 days. Authors submitting papers to the editorial board implicitly declare their publishing agreement in these conditions.

ROMANIAN AGRARIAN STRUCTURE AFTER THIRTY YEARS

Sergiu ȚÂRA [1]

Abstract: *Land ownership was and still is one of the most important indicators of wealth, even if the importance of agricultural sector has diminished in the last half of the century, at least in the developed countries. The current status of the Romanian agricultural sector is not only the sum of the agrarian reforms adopted in the nineties, but the result of the agrarian reforms of the past century and a half, with their instances of progress and regression, but, especially, their times of deep rupture.*

The article is a comparative analysis of the information available from the agricultural censuses of 1948, 2002, and 2010 and the structural investigation of the agricultural sector of 2016, capturing the developments which have taken place in the last 30 years, thus enabling us to draw conclusions as to these developments and the consequences of the post-1990 agrarian reforms.

The conclusion is that agricultural holdings are extremely polarized and very fragmented, mostly dwarf in size, economically inefficient, lacking a modern set of agricultural machineries, that determines low quantitative and qualitative productions as a result. This has caused the Romanian rural population to live on the brink of poverty and the agricultural sector to continue to be underdeveloped.

Keywords*: agrarian structure, economic inefficiency, land fragmentation, polarisation, rural underdevelopment*

Introduction

Nowadays' social reality, including the current structure of the agricultural sector, has been significantly influenced by the political decisions made immediately after the revolution of 1989. The agrarian reform of 1991, which continued throughout the last decade of the 20th century, had substantial effects on land ownership in Romania and otherwise determined the development of the rural areas overall.

The reform entailed the suppression of collective ownership and the return to private land ownership, the dissolution of the state agricultural holdings based on intensive exploitation of agricultural land, and the return to the *status quo* preceding the forced installation of the communist regime in Romania. Thus, one can observe the re-

---

[1] Assistant Professor, Department of Teacher Education and Social Sciences, University POLITEHNICA of Bucharest, E-mail: sergiu.tara@upb.ro

emergence and perpetuation of certain much older states of affairs rooted in the country's past.

The *'agricultural issue'*, as it is known in the field literature, together with the under-development of rural areas in general, has been one of the most important unsolved and persistent problems of Romanian society in the last two centuries. There are two aspects which need to be understood with respect to this issue: first, the fact that it affected the social category which included the overwhelming majority of the population in the past and continues to affect nearly half of Romania's current population (the rural population, which depend on agriculture); second, the fact that it has had major implications on other essential aspects of Romanian society, such as: economic development and efficiency, education, the health of the population, urbanisation, migration, demographic evolution, etc., which, in turn, perpetuated the cycle of underdevelopment in the rural world.

The question which naturally arises is: why, in the more than one hundred and fifty years of existence of the modern Romanian state, has one failed to develop a modern and efficient agricultural sector and a thriving peasant class, to the difference of many other European states, which succeeded in doing so, irrespective of whether they mostly supported the development of large agricultural holdings (such as Great Britain) or focused on creating a prosperous small and middling-farmer class (such as France and Germany, for instance).

Furthermore, one would be justified in asking certain other questions as well: is it possible to identify two different models of agricultural development (one in Western and another in Eastern Europe)? do Eastern-European states show similar patterns of evolution or are there certain differences between them? if such differences exist, when did they appear (is it a matter of different feudal development models, or did they emerge once capitalism developed on this continent)? were there any notable differences within the sphere of Eastern-European communism or between the strategies adopted by the states in this region after the fall of that regime? will these differences disappear due to a common evolution at the level of the European Union? etc.

The answers are obviously not simple.

The current status of the Romanian agricultural sector is the sum of the four major agrarian reforms of the past century and a half, with their instances of progress and regression, but, especially, their times of deep rupture: the transition from feudalism to a capitalist system, the dismantling of the agricultural structure based on private property and the development of a co-operative communist system, followed by its destruction and the return to a capitalist system. The fast-paced historical succession of these moments of deep rupture for Romanian society (feudalism-capitalism-communism-capitalism) was bound to have a profound influence on it, considering that the political, economic and social incompatibilities between the three systems are substantial and it should have taken several generations to adapt these rapid structural changes.

Steps forward and backward
in Romanian agrarian reforms

The first agrarian reform, the one of 1864, was the starting point of the transition of the agricultural sector from feudalism to capitalism. It was the result of the economic and political development of the Romanian Principalities that began after the Treaty of Adrianople (1829), which provided for free trade for the two principalities, as well as the diminution of Turkish economic and political influence in favour of Russia. Free trade had benefitted from strong support from Great Britain and France, the former being especially interested in cereal trade, given the particularly rapid industrial and demographic growth of the early 19th century.

The positive effects of the treaty were not immediate (Murgescu, 2010, p. 115-117), as the two principalities' cereal trade made a rather shy debut on the European market, its boom occurring later, around 1860 and carrying on throughout the second half of the 19th century. The economic benefits generated by this kind of trade became very significant, especially for great landowners/lessees, whose production went to export and who owned most of the agricultural land.

The agrarian reform of 1864, however, also constituted a genuine 'social revolution', the way most analysts have called it (Madgearu, Zeletin, Pătrășcanu, etc.), mainly due to the fundamental change it brought about in the structure and relations of the agricultural sector:

- as a result of this law, for the first time, peasants were granted ownership of a total of nearly two million hectares of land (approximately a quarter of Romania's arable land at that time), which evidently made it a socially radical law for that age;

- the reform also set out to maintain the economic profitability of agriculture; it aimed to grant ownership over more land to those peasant families that could afford to cultivate it (based on the number of draught animals they owned, peasants were divided into three categories: those with four oxen, those with two oxen, and those with none). The land was distributed to the following peasant categories: 413,202 hectares were granted to a number of 71,912 first-category peasants (20% of the land given in ownership); 882,737 hectares were distributed to 202,075 middle-category peasants (44.3%), and 381,708 hectares were allotted to 134,132 last-category peasants (19.2%). The distribution was uneven, as first-category peasants received an average of 5.7 hectares, middle-category ones 4.4 hectares, and last-category ones 2.8 hectare, the overall average being 3.9 hectares per family (Axenciuc, 1996, p. 88; Bărbulescu, Deletant, Hitchins, Papacostea and Teodor, 1998, p. 381, 528);

- Zeletin (1927/1992, p. 31-33) believed that one of the positive effects of the reform was the institution of an ownership regime of a capitalist nature, which turned peasants into owners and their land into goods, thus determining them to change their attitude towards work as well;

- large agricultural holdings continued to possess significant areas of land, which made Romania one of the largest cereal producers and exporters up until the beginning of the First World War.

However, the practical enforcement of this law brought about a series of negative consequences, which impacted on the viability of peasant agricultural holdings for half a century to come:

- the land distributed to peasants was not sufficient to ensure the economic viability of all peasant households and, in a great many cases, they plots were of poor quality, as they were located far away from villages; many peasants were allotted several disparate plots of land, which meant it took a long time to travel from one plot to another, thus rendering their exploitation inefficient (Pătrășcanu, 1925/1978, p. 27-28);

- the great landowners, alongside the Romanian state, continued to own about 70% of the arable land, as well as all of the grasslands and meadows. Thus, landlords secured the workforce they required for their land by capitalising on peasants' need for grasslands for their cattle, for additional land to lease, or for money. The reform also splited assets into two categories: on the one hand, the land was owned by great landowners and peasants and, on the other, the means of labour, the implements and workforce were owned exclusively by peasants, thus enabling the exploitation of peasant labour (Axenciuc, 1996, p. 77-78);

- forests became the private property of great landowners, which made it impossible for peasants to procure their firewood cost-free, as their right to collect it from forests was suspended;

- furthermore, the law provided for the payment of compensation for corvée and other feudal duties, which was to be made for 15 years. In addition, compensation was to be paid to landowners for the land expropriated in view of the reform. The immense burden of such payments encumbered the budgets of peasant families, while their tax burdens increased up to several times the previously owed amount (Pătrășcanu, 1925/1978, p. 27-28);

- one of the negative consequences of the reform concerned the emergence of 'new-serfdom' relations (Dobrogeanu-Gherea, 1910-1977, p. 61) as a result of agricultural agreements, which came to be seen as the main cause of peasant poverty up until the 1921 reform. In the early 20th century, 60% of peasant households were engaged in agreements with landowners or lessees;

- the law introduced the inalienability of land, the interdiction spanning 30 years (land could be alienated only to the local administration or to another villager), which prevented the genuine transformation of land into goods, the creation of a market for agricultural land and the trading thereof.

The shortcomings of the agrarian reform of 1864 had become obvious to everyone even from the early 20th century, while the extraordinary efforts made by the peasants during the First World War compelled the elaboration of a new law; the agrarian reform of 1921 sought to improve the situation of peasants who did not own sufficient land,

while also strengthening the category of medium-sized properties which had taken shape up to that point.

The agrarian reform aimed to eliminate large land properties (over 100 hectares); thus, 22,523 estates were expropriated, adding up to over 6,000,000 hectares, which gave the 1921 reform a particularly radical character, practically resulting in the disappearance of large land properties and of landowners as an economic and social class.

The data show that the process of granting ownership to the 2,300,000 with no or insufficient land who had signed up to receive it was a cumbersome one; by 31st December 1933, 1,500,000 peasants (64%) were made owners of over 3,400,000 hectares. The data also indicate that, 10 years after the reform was adopted, there was still a substantial number of families without any land (Axenciuc, 1996, p. 99-100).

This strategic decision to support small peasant holdings had numerous consequences for the agricultural system as a whole, often affecting in a negative way the economic viability of Romania's agricultural holdings:

- small peasant holdings became prevalent in interwar Romanian agriculture: almost 90% of the country's agricultural holdings were under 10 hectares; over 70% of these were under 5 hectares and amounted to more than half of the country's agricultural land;

- Romania ceased to be one of the greatest cereal exporters, as cereal production was channelled towards meeting the demand on the internal market of the Great Romania, which registered a significant increase as a result of demographic growth (due to both the joining of new provinces and the population's positive rate of increase);

- one of the consequences of the reform and of the high rate of natural growth during the interwar period was the further fragmentation of agricultural holdings and the perpetuation of poverty among the rural population; Madgearu (1940, p. 32) observed that an area of cultivated land of 17.5 million hectares corresponded to 13.5 inhabitants who lived off of land cultivation, so that the average cultivated area per capita was 1.34 hectares. The number of peasant properties under 1 ha (which represented 18.6% of all peasant holdings and 2.1% of the cultivated land) was characteristic of a rural economy based on dwarf properties, which was much worse than the situation in neighbouring agrarian states, such as Bulgaria, Yugoslavia, or Hungary;

- comparative data regarding other countries in the region, as well as developed countries in Western Europe show that, in Romania (similarly to Hungary), the total area of medium-sized properties, namely those between 10 and 100 hectares, amounted to 25% of the overall land area, while, in Bulgaria, the area of such properties amounted to 32% of the overall area, in Germany it was 40%, and in France it reached over 60% (Axenciuc, 1996, p. 242-243).

As a result, even though the amount of land distributed through the agrarian reform of 1921 was significant, it failed to bring about the economic viability of peasant households and stimulate the development of a prosperous middle class in Romania's

rural areas. Agricultural holdings remained small, a significant share of them even dwarfish, merely capable of ensuring the survival of peasant families.

At the end of the Second World War, under the increasing influence of the Soviet Union on the decisions of governments in Central and South-Eastern Europe, a series of new agrarian reforms took place in an attempt to improve the condition of peasants, but also destructure any instances of the rising middling-peasant class, which could put up a strong opposition against the communist regime.

The agrarian reform of 1945 was characterised by the lowest amounts of land given in ownership: land was expropriated from over 143,000 people, totalling a surface area of 1,444,000 hectares, and nearly 800,000 peasants were granted land amounting to 1,058,000 ha. To this, another 940,000 ha were added, which were nationalised in 1949, which means that middle-sized properties were dispossessed of a total area of 2,360,000 ha (Axenciuc, 1996, p. 102).

The negative impact of this law in relation to middle-sized properties, which had started to develop during the interwar period, consisted in the dispossession of persons owning over 50 ha of land, which was construed as one single agricultural property, irrespective of its positioning (arable land, meadows, orchards, artificial pools and ponds, etc.). This reform is also the first one to provide no compensation to deprived landowners.

Along with the land, the state also took possession, without delay or compensation, of all the equipment found on the agricultural land, which was to be part of county centres for the hiring of agricultural machinery meant to serve farmers, as well as of the implements and draught animals, proportionally to the expropriated land area, which were to be transferred to the peasants who were granted land ownership by operation of law. This law practically meant the confiscation of privately owned agricultural assets, which resulted in the destructuring of highly mechanised modern agricultural holdings, which had reached economic efficiency.

The peasants who received land were forced to pay for it: the price to be paid to the Romanian state was set at the level of one year's average crop, namely 1,000 kg of wheat and 1,200 kg of maize, respectively, with 10% of the cost to be paid in advance, while the rest was to be paid in instalments within a period of 10 years for those who owned land and 20 years for those without any, whereas former landowners had been expropriated without any kind of compensation.

The reform was followed by a process of forced collectivisation, which was particularly violent, at least in its initial stages, and aimed to eradicate the 'chiabur' (kulak) class: one of the systems employed was that of mandatory quotas, which meant the obligation to supply the state with agricultural products under the terms and for the prices established by the latter. The system imposed disproportionally large quotas for well-off peasant households, which led to their impoverishment (Larionescu, Mărginean and Neagu, 2006, p. 97). The duties and obligations enforced upon middling peasants were so burdensome that there were numerous cases in which they willingly relinquished their land to the state (Șandru, 2000, p. 308).

These economic measures were complemented by acts of physical anihilation, especially from 1949 to 1962, as part of one of the longest and most radical collectivisation campaigns in the Communist Block. Repression was most severe in Romania, as shown by the report of the Presidential Commission for the Analysis of the Communist Dictatorship in Romania (2006, p. 440-441): tens of thousands of peasants were sentenced and imprisoned, their property, including their homes, was confiscated, while their families were forced to pay rent in order to keep living in those homes, etc. Furthermore, the co-operative system created was a highly centralised statist one, which failed to reduce gaps and ensure the prosperity of peasants, who continued to survive economically during the communist period as well.

The agrarian reforms of the early 20th century determined the nearly complete disappearance of large agricultural holdings, while those after the Second World War abolished the class of middling agricultural landowners. Consequently, the structure of the Romanian agricultural sector of the mid-20th century consisted to an overwhelming extent of merely small areas of land for most peasants.

The communist system fostered the forced pooling of these plots of land, which led to the creation of large agricultural holdings, with a superior yield, yet founded on constraints and therefore artificial, which would be subject to dissolution immediately after the disappearance of the communist regime.

Restitutio in integrum and post-revolutionary agrarian reforms

Post-1989 agrarian reforms (Land Law 18/1991, as well as Law 169/1997 for the amending and supplementing of Land Law 18/1991, and Law 1/2000 for the reconstitution of ownership rights over agricultural and forest land requested under the provisions of Land Law 19/1991 and Law 169/1997) gradually restored, within a decade, private property rights over the land in the patrimony of the former agricultural and production cooperatives to both former co-operative members and their legitimate successors, according to the land ownership *status quo* before the forced installation of communism in Romania.

The philosophy of post-revolutionary agrarian reforms was, again, of a social nature: the law dissolved agricultural production cooperatives, which, in spite of all their problems, had proven to be more economically efficient than small agricultural holdings (pooled land yielded larger crops, while cooperatives used selected crops, possessed irrigation systems over relatively large areas, specialists, as well as various production equipment). The law of 1991 replaced them with economically inefficient small and dwarfish agricultural properties.

The first legal regulation restored ownership rights within the limits of at least 0.5 ha for each entitled person and no more than 10 ha per family in terms of arable land (by family one meant spouses and unmarried children). Those entitled could also request the difference between this area and that which they contributed to the agricultural

production cooperative, yet still no more than the amount of land stipulated by Law 187/1945 for the carrying out of the agrarian reform, namely 50 ha.

The arguments in favour of such a decision were numerous: private property needed to be constituted and upheld, with any future form of association having to be based on incentives, not coercion, while the expectations of the population and the pressure it exerted to reconstitute ownership rights were very high (particularly among elderly rural inhabitants, who had experienced the confiscation of their agricultural assets, the pressure and abuse of forced collectivisation during communism). There was also the solid argument regarding the need to ensure an additional level of income for the population in rural area. Naturally, undeclared political arguments prevailed as well, as the rural population constituted almost half of the country's population, which represented a category of voters chased after by the new political parties competing for power in elections.

The shortcomings of the agrarian reform of 1991 quickly became obvious, so that the governments which succeeded one another after 1996 wanted to re-evaluate the size of the land areas to be transferred to owners; hence, Law 1/2000 stipulated that the restoration of ownership rights should be carried out within the limit of 100 ha for each dispossessed landowner, both for agricultural and forest land. Moreover, the law provided for the possibility of pooling where possible for the differences in land areas between 50 and 100 ha. Thus, this new law allowed for the concentration of land and the creation of middle-sized holdings that should have constituted the driving force of Romanian agriculture.

This massive transfer of agricultural property towards a significant number of private beneficiaries, some of which were uninterested in agricultural activities or unable to cultivate the land they were made owners of, would generate a series of negative economic effects on agricultural holdings in Romania, as well as on the agricultural sector as a whole, among which we would like to mention the following:

- granting ownership over small land areas caused most Romanian agricultural holdings to grow crops only for their own consumption, agricultural production thus dropping significantly. According to Otiman (2012, p.340), two economic indicators relevant for the analysis of the dynamics of agriculture (the average cereal production and the value of agricultural production) highlight the stagnation, perhaps even regression brought about by the agricultural policies of the last 30 years: the average cereal production for the 1990-2011 period was at an average level of 40-45% of the EU average, while the value of agricultural production for 1998-2009 was around 800-900 euro/ha in Romania, compared to 1,800-2,000 euro/ha in the EU;
- the restoration of land ownership resulted in many owners of an advanced age, incapable of working the land, thus leading to many plots being left uncultivated;

- in many cases, the ones to receive the land were the rightful owners' heirs, who lived in urban areas and were engaged in non-agricultural activities;
- the quality of crops dropped due to the decrease of the permanent employment of specialists in the field;
- due to the lack of interest, the low value of land plots, etc., many heirs of the initial owners failed to carry out the legal procedures required to register agricultural properties so that, at present, it is impossible to identify the real owners or the possessors of significant areas of Romania's land, which has negative effects on the long-term development of the Romanian rural world;
- the process of granting ownership was long and cumbersome and, at the end of it, part of the agricultural land ended up being owned or exploited by the local elites (former cooperative presidents or specialised personnel), who possessed the knowledge and connections required to produce and commercialise agricultural products (Aligică and Dabu, 2003, p. 54-55). Even though there are no data regarding the expansion of this phenomenon, the reality in certain parts of the country shows the large agricultural holdings belong to members of the former or current local elites.

One important aspect worth stressing is that not all communist states adopted the same methods for carrying out the transition to private property in agriculture after the fall of communist regimes, as each country had its own strategy for the reformation of the agricultural sector, as well as its own reform timeline. Obviously, the strategies they employed were influenced by their historical past, the current situation in each state at the time of the reforms, etc.

One study focused on the agrarian reforms in 25 former communist states in Central and Eastern Europe, as well as in the former soviet region (Hartvigsen, 2014, p.332), identifies six general approaches exhibited by agrarian reforms across the ex-communist area: four of them aimed to return the land to its former pre-communist owners, while two of the approaches set out to distribute the land to the current rural population. The strategies for the restitution of the land to former owners, in most of the states which opted for this approach, mainly sought to reconstitute properties in their old locations and, wherever that was no longer possible, other plots of land were allotted; a second approach allowed former owners to withdraw from cooperatives and take with them the areas of land which they had put in them; some states offered compensation in the form of vouchers, others in monetary form; one final version aimed for privatisation through the sale of state land. The agrarian reform strategies regarding the distribution of land sought to allot either actual plots of land or shares in land under exploitation. It is necessary to stress that it was very rare for one single approach to be employed; as a rule, there was one general approach and one or several secondary ones, depending on the specific local context, as can be seen in the table below:

Table 1. The general approach of the agrarian
reform in former communist states

		Land reform approach						
		Restitution				Distribution		
Region	Country	Restitution to former owners (including other land when restitution on old boundaries not possible)	Withdrawal of formally private land from collective farms	Compensation	Privatization through sale of State land	Distribution in physical parcels	Distribution in land shares	No agrarian reform
Baltic states	Estonia	x		o	x			
	Latvia	x		o	o			
	Lithuania	x		o	o			
Central-European countries	Czech Republic	x	x	o	o			
	Slovakia	x	x	o	o			
	Hungary			x	x	x		
	Poland				x			
	Eastern Germany	x	x	o	x			
Balkan countries except former Yugoslavia	Albania	o		o		x		
	Romania	x		o		o		
	Bulgaria	x		o	o			
Former Yugoslavia countries	Slovenia	x						
	Croatia	x		o	x			
	Serbia	x			x			
	Bosnia-Herzegovina							x
	Montenegro	x			x			
	Macedonia	x						
	Kosovo				x			
Western CIS countries	Moldova		o			x	o	
	Ukraine		o			x	x	
	Russian Federation		o				x	
	Belarus							x
Trans Caucasus states	Armenia					x		
	Georgia					x		
	Azerbaijan		o			x	o	

x – main approach
o – secondary approach

Source: M. Hartvigsen, 'Land Reform and Land Fragmentation in Central and Eastern Europe', p. 333.

As can be concluded, Romania adopted an agrarian-reform philosophy which is not unique in the former communist area, the restitution of the land to its former owners being the most widespread method in 13 of the 25 states under analysis (Estonia, Latvia, Lithuania, the Czech Republic, Slovakia, East Germany, Romania, Bulgaria, Slovenia, Croatia, Serbia, Macedonia, and Montenegro).

The conclusion reached by those who have analysed the agrarian reforms of former communist states, however, is that those countries which did not completely dismantle

the former co-operative structures registered superior agricultural results compared to those which went through radical reforms for the restitution of land in its pre-collectivisation forms (Mihalache, 2020, p. 50).

The current structure of the agricultural sector: fragmentation and economic (in)efficiency

Fragmentation is characteristic to several Eastern-European states, having resulted from the regional historical context, as well as from the strategies implemented by each of these states in the years following the collapse of communist regimes. There are two types of fragmentation in the field of agriculture: a fragmentation of properties, which means that they consist of subdivisions which are much too small to be exploited rationally, and a fragmentation of holdings, which implies that they are made up of numerous disparate plots of land, which has much more serious negative economic effects. When analysing the fragmentation of agricultural holdings, one needs to take into account a multitude of factors, such as: the size of the agricultural holding, the size of its parcels, their number, their distribution and the distance between them, the shape of the parcels (King and Burton, 1982, p. 475-480).

One aspect which needs to be stressed from the very beginning is the fact that there is a difference between an agricultural property and an agricultural holding when it comes to fragmentation analysis: viable agricultural holdings can emerge even if we are dealing with a fragmented agricultural property, in which case fragmentation does not have a direct negative effect upon the efficiency of the agricultural activity. Land ownership, however, is definitely affected by the medium-term and long-term development of the rural population, given that a demographic increase can lead to the accentuation of fragmentation, while the ageing of the population can result in the spontaneous pooling of agricultural properties.

Economists and sociologists (Axenciuc, 1996, p. 107) underscore the essential difference between an agricultural property and a holding, one that needs to be taken into account by any analysis of the agricultural sector and has major economic and social implications: an agricultural holding entails an agricultural property which is being capitalised on. In order to analyse the current Romanian agricultural reality, we will refer to the size and size-based categorisation of agricultural holdings – as opposed to properties, as they represent an indicator of the efficiency of agricultural activities.

The data presented in the following table uses the information available from the agricultural censuses of 1948, 2002, 2010 and the structural investigation of the agricultural sector of 2016, capturing the developments which have taken place in the last 30 years, thus enabling us to draw conclusions as to these developments and the consequences of the post-1990 agrarian reforms. We have included the data from the 1948 census as a starting point and comparison, as the Romanian agrarian reforms after 1989 aimed to reconstitute properties according to the *status quo* after the Second World War:

Table 2. Agricultural holdings according to size
(number and utilised agricultural area)

Number of holdings and utilised agricultural area	1948[1]	2002[2]	2010[3]	2016[4]
Agricultural holdings under 1 ha				
Number of holdings (% of the total number)	529,474 (17.10%)	2,221,508 (49.53%)	1,999,533 (52%)	1,770,569 (52.98%)
Utilised agricultural area (% of the total utilised agricultural area)	305,000 (2.26%)	770,665.77 (4.91%)	733,519.48 (4.67%)	639,180.15 (5.11%)
Agricultural holdings of 1-5 ha				
Number of holdings (% of the total number)	1,813,755 (58.58%)	1,925,388 (42.93%)	1,524,899 (39.66%)	1,290,358 (38.61%)
Utilised agricultural area (% of the total utilised agricultural area)	5,718,000 (42.30%)	4,442,543.05 (28.28%)	3,511,485.59 (22.37%)	2,949,226.62 (23.59%)
Agricultural holdings of 5-10 ha				
Number of holdings (% of the total number)	551,090 (17.80%)	263,715 (5.88%)	222,933 (5.80%)	194,200 (5.81%)
Utilised agricultural area (% of the total utilised agricultural area)	4,324,000 (31.99%)	1,740,279.52 (11.08%)	1,487,340 (9.48%)	1,304,357.10 (10.43%)
Agricultural holdings under 5 ha				
Number of holdings (% of the total number)	2,343,229 (75.68%)	4,146,896 (92.46%)	3,524,432 (91.66%)	3,060,927 (91.58%)
Utilised agricultural area (% of the total utilised agricultural area)	6,023,000 (44.56%)	5,213,208.82 (33.19%)	4,245,005.07 (27.05%)	3,588,406.77 (28.70%)
Agricultural holdings under 10 ha				
Number of holdings (% of the total number)	2,894,319 (93.48%)	4,410,611 (98.34%)	3,747,365 (97.45%)	3,255,127 (97.40%)
Utilised agricultural area (% of the total utilised agricultural area)	10,347,000 (76.54%)	6,953,488.34 (44.27%)	5,732,345.28 (36.52%)	4,892,763.87 (39.13%)
Agricultural holdings of 10-100 ha				
Number of holdings (% of the total number)	187,738 (6.06%)	63,840 (1.42%)	83,432 (2.17%)	74,748 (2.24%)
Utilised agricultural area (% of the total utilised agricultural area)	2,231,060 (16.50%)	1,194,928.7 (7.61%)	1,879,323.32 (11.97%)	1,636,317.91 (13.09%)
Agricultural holdings over 100 ha				
Number of holdings (% of the total number)	14,120 (0.46%)	10,442 (0.23%)	14,448 (0.38%)	12,310 (0.37%)
Utilised agricultural area (% of the total utilised agricultural area)	940,000 (6.95%)	7,559,539.59 (48.13%)	8,083,358.81 (51.50%)	5,973,453.71 (47.78%)
TOTAL:				
Number of holdings	3,096,177	4,484,893	3,845,245	3,342,185
Utilised agricultural area	13,518,060	15,707,956.63	15,695,027.41	12,502,535.49

Sources: [1]V. Axenciuc, Evoluția economică a României. Cercetări statistico-istorice 1859-1947. Vol. II - Agricultura, p. 214; A. Golopenția, P. Onică, 'Recensământul agricol din Republica Populară Română la 25 ianuarie 1948. Rezultate provizorii' in A. Golopenția, S. Golopenția, Opere complete. Vol. II - Statistică, demografie și geopolitică, p. 483-484; [2]Recensământul general agricol 2002; [3]Recensământul general agricol 2010; [4]Ancheta structurală în agricultură 2016, p. 20-21.

One initial observation which immediately emerges from the analysis of the data in the table has to do with the fact that there is a certain consistency as to the total number of agricultural holdings in the last half a century, except for the data revealed by the 2002 general agricultural census, which show a significant increase (by almost 50%) in their number compared to the situation in 1948. The large number of agricultural holdings in 2002 accounts for the negative effects of the post-revolutionary agrarian laws, which pulverised agricultural holdings in a manner unprecedented in the history of Romanian agriculture.

Other negative developments can be observed upon analysing the situation of the total utilised agricultural area, which registered a significant increase (over 20%) during the communist period, as a result of the expansion of agricultural areas, by a maximum of almost 16 million hectares in 2002, a surface area which remained relatively constant until 2010, after which we witness a significant drop until 2016 (the disappearance of three million cultivated hectares compared to 2010 and one million lost hectares compared to 1948).

As can be seen, the average utilised agricultural area per agricultural holding also registered a significant decrease: it used to be 4.36 ha in 1948, dived down to 3.5 ha in 2002, rose to 4.08 ha in 2010, as a result of the concentration of agricultural holdings, after which it dived down again to 3.74 ha in 2016. The severe drop revealed by the 2016 structural investigation of the agricultural sector can only be explained by the significant reduction of the total agricultural area; had the agricultural area remained at a similar level to that of 2010, the average area would have been 4.7 hectares, more than at any other previous point in history.

If one were to trace where the 3 million utilised hectares went, one will notice that the most significant loss of utilised area lies, paradoxically, with the large agricultural holdings (over 100 ha), which shrank by 2.1 million hectares, while 200,000 hectares disappeared from middle-sized holdings and over 800.000 hectares from holdings under 10 hectares. The existing data do not allow for a more detailed analysis, but we may assume that, given that the number of agricultural holdings remained relatively constant during the period under analysis, the decrease may have been caused by the abandonment of agricultural areas with low potential, which ceased to be leased and exploited, the cause thus being found to lie again with small landowners.

The phenomenon of the disappearance of some agricultural holdings is a general one at European level, considering that, within the European Union, between 2005 and 2016, their number decreased by 4.2 million (almost one quarter of the total), 85% of which were the ones under 5 hectares (Eurostat, 2018, p. 22). However, the issue which should draw attention in the case of Romania is that, between 2002 and 2016, over one million agricultural holdings disappeared, which is a quarter of the total number thereof in the European Union.

A more detailed analysis of the data (see **Table 2**) allows us to draw a few relevant conclusions as to the instances of progress/regression which can be observed in the last thirty years:

- the structure of Romania's agricultural sector is unique in the European Union, as it is characterised by a highly pulverised set of agricultural holdings: of the total 10.5 million agricultural holdings found in the EU in 2016, one third (32.7%) are in Romania, while their utilised agricultural area represents a mere 7.2% of the total European utilised area (12.5 million hectares out of a total of 177 million), which means that the average area per holding is significantly smaller in the case of Romanian holdings; furthermore, the data (Eurostat, 2018, p.18) show that the number of agricultural holdings in Romania is similar to the sum of the numbers in the three EU countries which follow it by number of holdings: Poland (13.5%), Italy (10.9%), and Spain (9.0%);

- over half of the agricultural holdings in Romania (52.98%) are dwarfish (under 1 ha); in 2016, these were exploiting a mere 5% of the country's total utilised agricultural area, which made for an average surface area of 0.4 ha per holding, which means that they can only ensure the survival – and a precarious one at that – of their owners;

- very small agricultural holdings (under 5 ha) constitute over 91% of the total number of Romanian agricultural holdings and possess little over a quarter of the utilised agricultural area;

- upon analysing the ensemble of agricultural holdings under 10 ha (dwarfish, very small, and small ones), we notice that they amount to 97.40% of the total, while exploiting 39.13% of the utilised agricultural area. If we were to compare that to the situation at start of collectivisation (1948), we would find that, even though the number of agricultural holdings was similar (93.45% of the total in 1948), they were exploiting 76.54% of the total utilised agricultural area, which is more than double the present amount (over 10 million hectares as opposed to the 4.9 million in 2016). This shows that, in spite of the sometimes anti-economic nature of the reforms of the second half of the 20th century, they managed to provide the category of small agricultural properties with much more substantial areas of land;

- the number of middle-sized agricultural holdings (between 10 and 100 ha) is half of that in 1948, with a surface area of 1.6 million ha compared to 2.2 million, which testifies to the failure of post-1990 reforms to build a strong set of middle-sized properties and middle class in the Romanian rural world. The data reveal excessive polarisation, with, on the one hand, a huge number of small agricultural holdings, some of them dwarfish, and, on the other, a small number of large agricultural holdings, which utilise almost half of the country's agricultural land;

- even though the number of large holdings is relatively constant, the area exploited by these is 8 times greater in 2002 and 6 times so in 2016, as compared to 1948;

- the area owned by the large agricultural holdings (over 100 ha) increased from 6.95% in 1948 to 48.13% in 2002, 51.50% in 2010, 47.78% in 2016, which shows that large holdings were reconstituted spontaneously, returning to a

level similar to that which existed at the time of the 1921 reform. This reality confirms once again that large holdings are more economically efficient.

The fact that little over one quarter (28.70%) of the total area is utilised by small agricultural holdings (under 5 ha) explains a great many of the negative social aspects present in today's Romanian rural world: poverty, a low level of healthcare and education, inadequate living conditions, low quality of life, etc.

The connection between migration and the state of the agricultural sector is more than obvious: a recent study (Mihalache, 2015, p. 197) shows that the great population losses occur in rural areas which are either isolated or located at long distances from towns and cities, while peri-urban areas register increases in population in general and in young population, in particular. This proves that young people in areas with no prospects of long-term development move to job-generating centres or to other countries. Thus, the population left behind in isolated areas becomes increasingly scarce and ageing, which has negative long-term social and economic consequences, including for agricultural properties and holdings.

The current structure of the agricultural sector: polarisation and poverty

As we have already shown, 97.40% of all the agricultural holdings in Romania are under 10 ha, while utilising only 40% of the total agricultural area, which renders them incapable of becoming economically viable. At the same time, agricultural holdings over 100 ha, which represent 0.37% of the total, utilise 47.78% of Romania's entire agricultural area, which makes for a strong polarisation between small and large agricultural holdings, which will have a negative impact on the development of rural areas and of the peasant population for a long time to come. Even though the areas utilised by small agricultural holdings are reduced, for three decades, they have provided the means for survival for the bulk of the rural population, thus leading to the emergence of what Vladimir Pasti (1997, p.47-48) called a 'survival society'.

In order to understand the high level of polarisation in Romania, it is of interest to compare the percentage of different size categories of agricultural holdings and the percentage of utilised area in the EU-28 to those in Romania. The data in **Table 3** show that two thirds of European farms utilise less than 5 hectares, while, in Romania, the percentage of holdings in this size category is over 91%; the area utilised by such farms in the EU-28 is 6.1% of the total area, while, in the case of Romania, the percentage is almost 30%. However, this situation is not unique to Romania, but occurs in other states in the same region as well (Van Dick, 2003, p. 150-151).

When it comes to small properties (under 10 ha), in the EU-28, they amount to 77.7% of the total, compared to 97.4% in Romania, while the area they utilise represents 11.2% of the European total and 38.7% for Romania, which gives us an image of the prevalent type of agricultural holdings in this country. However, there are other states in the region exhibiting a similar situation.

As for the other end of the spectrum, farms over 100 ha represent 3.3% of all holdings in the EU-28, while, in the case of Romania, they account for 0.4%. The area they utilise amounts to 52.7% at European level, while, for Romania, that percentage is 47,8%, which shows a more accentuated concentration of land in the case of Romania's agricultural holdings.

As can be observed, it is middle-sized agricultural holdings (10-100 ha) which are in the most delicate situation: 19% for the EU-28, compared to 2.2% for Romania; middle-sized properties exploit over one third of the agricultural area in Europe (36.1%), while, in Romania, that percentage is merely 13.2%, i.e. a third of the surface utilised at European level, thus showing the dimension of the failure of the post-revolutionary agrarian reforms to consolidate middle-sized properties in Romania's rural area, which could have led to its economic prosperity, as well as to that of its inhabitants engaged in agricultural activities.

Table 3. The situation of agricultural holdings categorised by size and utilised area in the EU-28 and in Romania

	The percentage of agricultural holdings		The percentage of utilised area	
	EU-28	**Romania**	**EU-28**	**Romania**
Under 5 ha	65.6	91.6	6.1	28.7
5-10 ha	12.1	5.8	5.1	10.4
10-20 ha	8.3	1.5	7.0	5.3
20-30 ha	3.5	0.3	5.1	2.1
30-50 ha	3.6	0.2	8.5	2.3
50-100 ha	3.6	0.2	15.5	3.4
Over 100 ha	3.3	0.4	52.7	47.8

Source: Eurostat, 2018, p. 18

The data above reveal that agricultural holdings in Romania are extremely polarised and that is but one facet of the explanation regarding the poverty of a large portion of the rural population. The second cause derives from the large share of rural population engaged in agriculture, either as employees or as unpaid agricultural workers; the share of the rural population was very high throughout the 20th century, as, even today, it represents almost half of the country's population, as shown by the data in the table below:

Table 4. The share of the population engaged in agriculture

Years	Total population			
	Total (thousands)	Rural %	Urban %	Employed farming population (thousands)
1950	16,311	76.6	23.4	6,209
1989	23,159	46.8	53.2	3,012
2000	22,435	45.4	54.6	3,523
2015	19,819	46.2	53.8	2,184

Sources: Romania's Statistical Yearbook, 2016

The data show that the population engaged in agriculture decreased by 1 million people compared to 1989, which is almost a third. Even though the farming population diminished dramatically in comparison to the interwar period, it remains disproportionally large; according to the official data (INS, AMIGO series, 2017), in 2017, the working population in rural areas was distributed as follows: of the 8,671,000 employed people, 1,975,000 were engaged in agriculture, forestry, and fishing, while in the EU-28 nearly 10 million European citizens work in agriculture, which represents 4.2% of the total European population. We can see that Romania ranks first in this respect, with 23% of its employees working in agriculture, compared to Bulgaria's 17.5%, Greece's 10.7%, Poland's 10.1% (Eurostat, 2018, p.25). What should be a cause for alarm as to the excessively large number of people engaged in agriculture is the fact that those two million people in Romania represent almost one fifth of the European total.

This situation is emblematic for the inefficiency of the Romanian agricultural sector: Vladimir Pasti (2006, p. 125-126) shows that, in 1930, 10.5 million peasants (over half of them illiterate, lacking modern equipment, irrigation, or fertilisers) produced approximately 10.5 million tons of cereals, which means an average of 1,000 kg per peasant. In 1999, one peasant produced 4,300 kg, i.e. four times more, while, in France, one French farmer produced 53,000 kg (12 times more) and an American one 86,000 kg (i.e. 20 times more). Moreover, he (*ibid.*, p. 433-434) believed that the current structure of the agricultural sector is increasingly polarised due to the large-scale dispossession of small and medium-sized agricultural holdings, which will free a large mass of the active farming population, which will no longer be able to be absorbed by the labour market in the developed states of the European Union; modern agriculture would require half a million people, which raises the question of what can be done with the surplus of one and a half million people.

The situation is more complicated when analysing the status of the people engaged in agriculture, forestry, and fishing: only 10% have employee status (compared to 73.7% of the total employed population in Romania), while 54.8% are self-employed and 35.2% are unpaid family workers. The 'unpaid family workers' phenomenon was constantly present throughout the 20th century (Larionescu, Mărginean and Neagu, 2006, p.210), their number making it nearly impossible for peasant households to become profitable, with the exception of villages located near cities, which allowed for agricultural activities to be combined with paid employment in the neighbouring city.

The current structure of the agricultural sector: a lack of records as to owners and agricultural areas

The registration of properties in Romania is deficient, especially in the case of rural properties located in the open countryside, which constitute the overwhelming majority of land areas utilised by agricultural holdings. The causes of this state of affairs are numerous (Mihalache, 2020, p. 59), having built up along the thirty years which passed since the beginning of the restoration of private property following the agrarian reform of 1991; the most significant of them are related to the difficulty of identifying the owners of the plots of land and to the precarious legal regime regarding land. An

exhaustive – yet obviously incomplete – presentation of these causes shows the multitude of problems generated by the laws of the post-revolutionary reform, which will take a long time to solve; until such a time as they are solved, the issues of the agricultural sector will persist:

- the failure to complete the process of granting title deeds;
- the inconsistent application of land legislation;
- the legal provisions as to the granting of ownership over land in the old locations being impossible to enforce in a great many cases;
- a lack of documents attesting to land ownership;
- the impossibility of identifying the owners/actual possessors/rightful heirs of certain properties (not found in the village/town, lack of succession documentation, etc.);
- inconsistencies between extant and allotted areas (allotment was carried out based on the declarative records in agricultural registries);
- dysfunctionalities of the local administration;
- modifications caused by land-use work conducted during the communist era (deforestation, drainage of bodies of water, the building of irrigation systems and means of access, etc.);
- the use of obsolete land-registry maps made in 1970-1980 or the complete lack thereof;
- the numerous disputes and trials between owners or their successors;
- civil status errors (particularly regarding the correct names of people and their overlapping in the records);
- the large number of owners and the fragmentation of land areas (as a consequence of agrarian reform laws, as already shown), which entailed a large work volume;
- lacking/poorly trained specialists used by local rural authorities;
- the reluctance of part of the population to have properties registered (particularly the fear of their subsequent overtaxation);
- ill will.

The problem of a lacking land register and the impossibility of legal land trade, as well as the inexistence of other clear records as to the size of agricultural properties, is an older one, particularly in certain regions of Romania. It was invoked in the interwar period as well, for instance, and in the 1948 agricultural census, when the specialists conducting the data collection operations complained that many heads of agricultural holdings estimated their size based on the number of days it took to plough or mow them (Golopenţia and Onică, 1999, p. 474). Even today, there is only an estimation of the general number of properties in Romania: approximately 40 million, 80% of which are located in rural areas, of which 12% are registered, as opposed to 45% in urban areas.

This problem became much more serious after 1990, as plots of land were transferred as private property to their post-World War II owners without bringing any significant improvements to the records thereof. The situation began to change substantially only after Romania's integration into the European Union, as a result of external pressure.

One of the targets of all the governing programmes of the last decade has been to increase the percentage of systematically registered properties. Thus, the investment programme for services of cadastre and systematic registration are included in a National Cadastre and Land Register Programme (Programul Național de Cadastru și Carte Funciară - PNCCF), which, for 2018-2020, is allocated 913 million euro in funding (313 million from grants and 600 million from the state budget). The funding based on external non-reimbursable funds, through the major project included in Priority axis 11 of the ROP 2014-2020, called 'Geographical Expansion of the System for Registering Properties in the Cadastre and Land Register', approved by the European Commission in 2018, will provide citizens with free registration in the integrated cadastre and land register system for all the properties in 660 communes, amounting to a total area of 5,758,314 ha. The systematic registration work can be done at cadastral-sector level as well, so that, at present, it is being carried out in 2.039 ATUs (administrative territorial units), with 2,311,690 ha completed and 4,732,290 ha in progress.

The pressure to carry out the registration of properties in Romania, especially of those in rural areas, came from the European Union; starting with the new programming stage, agricultural land subject to PIAA (Paying and Intervention Agency for Agriculture) subsidies will have to be registered into the integrated cadastre and land register system: of the total 9.54 million ha receiving subsidies, 5.22 million ha (54.66%) have been registered up to the present time, while another 4.10 million ha (43%) are to be processed under contract, the deadline being the end of 2020, which means that 98% of the subsidised agricultural land will have been registered (i.e. almost three quarters of the country's agricultural land).

The lacking registration of properties prevents their legal trading (title transfers are carried out without meeting legal requirements, which constitutes a new problem as to the subsequent identification of the true owners), which is the modern equivalent of the inalienability of the first agrarian reforms in Romania. All these factors represent an impediment for business opportunities, the taxation of the respective land, the elaboration of strategies for sustainable development, or the commission of infrastructure works, including the possibility of attracting European funds.

The situation of the registration of rural properties in Romania is significantly inferior to that in neighbouring countries, which constitutes a red flag for future developments in the Romanian agricultural sector (Eurostat, 2018, p. 30). This represents an important, though not exclusive, cause of the costs of arable land in Romania being the lowest in the European Union, with an average price of 1,956 euro per hectare (compared to an average above 20,000 euro for most Western-European states or nearly 80,000 euro for the Netherlands, which finds itself at the other end of the spectrum).

Final remarks

Romanian agrarian reforms sought nothing other than to consolidate Romanian small properties, yet failed to ensure their economic independence at the same time: thirty years after the restoration of land ownership rights, over 95% of all the agricultural holdings in Romania qualify as small (under 10 ha), while over 70% of them qualify as very small and dwarfish (under 5 ha and under 1 ha, respectively). Thus, the result was the survival on the verge of – sometimes severe – poverty of the rural population.

One paradox of post-revolutionary agrarian reforms is that, even though, at least at declarative level, the creation of large agricultural holdings was not desired, they emerged spontaneously and ended up utilising almost half of the country's agricultural land. Thus, the situation returned to its form before the 1921 reform, which abolished, at that time, large agricultural properties/holdings in Romania: in 1921, 22,523 estates totalling 6 million hectares were expropriated, which is the equivalent of the land utilised today by a number of 12,310 large holdings (over 100 ha). The concentration of land within large agricultural holdings is all the more significant considering that, at present, the number of holdings is half of that of the early 20th century, while utilising approximately the same agricultural area.

As a consequence, the current Romanian agricultural sector is highly polarised, formed of two types of entities with different characteristics and functionalities: small agricultural holdings, the production of which is low in terms of quantity and quality, and directed especially towards their own consumption, and large farms, which own approximately half of the agricultural land and feature mechanised production, which is oriented towards the commercialisation of products. However, what is scarcely present is the transitional link which constitutes the key element in Western Europe, namely family farms, cooperatives, or small-producer associations (Mihalache, 2020, p. 51). Thus, the sector of medium-sized farms continues to lack growth prospects, at least in the near future, given that the developments in the last few years point towards a process of pooling and growth of large holdings.

As we have shown, Romania possesses the highest number of agricultural holdings in the European Union (about one third of them, yet which utilise merely 8% of the agricultural area), which means that the average area of these holdings positions the country last among member states: 3.6 ha, followed only by Cyprus, with 3.1 ha, and Malta, respectively, with 1.2 ha. The average area of agricultural holdings in the other former communist states is two or three times larger (Slovenia, 6.7 ha; Hungary, 9.5 ha; Croatia, 10 ha; Poland 10.1 ha), while most states feature average areas of over 30-50 hectare, with the Czech Republic having the largest average area of agricultural holdings, 133 ha (Mihalache, 2020, p. 62).

Otiman (2012, p. 341) rightfully believes that the effects of the agrarian reforms, combined with the post-1990 agrarian policies, generated an underperforming, weak, non-competitive, mostly subsistence-oriented agriculture, with the following economic and social effects: the significant reduction of agricultural areas due to a large portion of arable land not being utilised (in the last ten years, the utilised agricultural area decreased by three million hectares, which is a fifth of the utilised area); the drastic

diminution of livestock; physical and social desertification, as a maximum of 8-10% of the country's irrigation potential is being used; depopulation, the ageing of the rural population, the qualitative and professional decrease of the agricultural workforce; the persistence of zones of extreme poverty (overlapping those regions in particular where the most accentuated polarisation of agricultural holdings is present); the prevalence of primary agriculture; the quasi-complete disappearance of social rural economy.

The employment situation in rural areas is also especially complex: over two thirds of the rural population is still either self-employed or performing unpaid work, while 54% of these individuals are engaged in subsistence agriculture. The Romanian agricultural sector has the lowest rate of wage employment – 5.2%, while in Poland it is almost double, in Bulgaria it surpasses 46%, and in Slovenia it reaches over 80% (ICCV, 2017, p.12).

The future of agricultural holdings is an uncertain one: although, in the last few years, it has seen a spectacular increase in the number of properties registered in rural areas, particularly agricultural properties, it has not reached the initially envisaged targets. The impact of this situation on Romania's rural world may be significant, considering that the subsidies granted to agricultural producers in the next programming stage will be conditioned by the registration of their respective land areas, which will lead to a lack of funding for certain agricultural holdings, thus negatively impacting their activity.

Furthermore, the post-1989 system of property restitution a has generated a new class of intermediaries, who became the main beneficiaries of restitutions instead of the true former owners. This system has brought about high inequality and corruption, eventually leading to the emergence of a *nouveau riche class* and a veritable *'neofeudal'* system (Zamfir, 2015, p. 34).

References

Aligică, P. D., Dabu, A. (2003). Land Reform and Agricultural Reform Policies in Romania's Transition to the Market Economy: Overview and Assessment, *Eastern European Economics*, Vol. 41, (5), p. 49-69

Axenciuc, V. (1996). *Evoluția economică a României. Cercetări statistico-istorice 1859-1947*. vol. II – Agricultura, București: Editura Academiei Române

Bărbulescu, M., Deletant, D., Hitchins, K., Papacostea, Ș., Teodor, P. (1998). *Istoria României*, București: Editura Enciclopedică

Dobrogeanu-Gherea, C. (1910/1977). *Neoiobăgia. Studiu economico-sociologic al problemei noastre agrare*. vol. IV, București: Editura Politică

Golopenția, A., Onică, P. (1999). *Recensământul agricol din Republica Populară Română la 25 ianuarie 1948. Rezultate provizorii*, in Golopenția A., Onică P., *Opere complete*. vol. II - Statistică, demografie și geopolitică, București: Editura Enciclopedică, p. 474-660

Hartvigsen, M. (2014). Land Reform and land fragmentation in Central and Eastern Europe. *Land Use Policy*, (36), p. 330-341

Institutul pentru Cercetarea Calității Vieții. (2017). *Starea socială a României. Calitatea vieții: situația actuală și perspective pentru 2038*, Bucharest: Institutul pentru Cercetarea Calității Vieții

Institutul Național de Statistică. (2017). *Anuarul statistic al României 2016*

King, R., Burton, S. (1982). Land Fragmentation: notes on a fundamental rural spatial problem, *Progress in Human Geography*, 6, (4), p. 475-494

Larionescu, M., Mărginean, I., Neagu, G. (2006). *Constituirea clasei mijlocii în România*, Bucureşti: Editura Economică

Madgearu, V. (1940). *Evoluţia economiei româneşti după războiul mondial*, Bucureşti: Independenţa Economică

Mihalache, F. (2015). *Dimensiuni ale diferenţierii demografice în mediul rural după 1990*, in Zamfir C., Stănescu I. (coord.) (2015). *România la răscruce: opţiuni pentru viitor*, Bucureşti: Pro Universitaria, p. 196-209

Mihalache, F. (2020). *Mediul rural între 1990 şi 2020. Transformări şi decalaje*, Cluj: Presa Universitară Clujeană

Murgescu, B. (2010). *România şi Europa: acumularea decalajelor economice (1500-2010)*, Iaşi: Polirom

Otiman, P. I. (2012). Structura agrară actuală a României – o mare (şi nerezolvată) problemă socială şi economică a ţării, *Revista Română de Sociologie*, XXIII, (5-6), p. 339-360

Pasti, V., Miroiu, M., Codiţă, C. (1997). *România – Starea de fapt*. Vol. I. Societatea, Bucureşti: Nemira, 1997

Pasti, V. (2006). *Noul capitalism românesc*, Iaşi: Polirom, 2006

Pătrăşcanu, L. (1925/1978). *Studii economice şi social-politice 1925-1945*, Bucureşti: Editura Politică

Şandru, D. (2000). *Reforma agrară din 1945 din România*, Bucureşti: Institutul Naţional pentru Studiul Totalitarismului

Van Dijk, T. (2003). Scenarios of Central European land fragmentation, *Land Use Policy*, (20), p. 149-158

Zamfir, C. (2015). *Spre o nouă teorie a tranziţiei*, in Zamfir C., Stănescu I. (coord.) (2015). *România la răscruce: opţiuni pentru viitor*, Bucureşti: Pro Universitaria, p. 15-43

Zeletin, Ş. (1927/1992). *Neoliberalimul. Studii asupra istoriei şi politicii burgheziei*, Bucureşti: Scripta

Agenţia Naţională de Cadastru şi Publicitate Imobiliară. *Programul Naţional de Cadastru şi Publicitate Imobiliară (2015-2023)*. http://www.ancpi.ro/pnccf/documente/Cadastru_prezentareMDRAP.pdf. Accesed on October 2020

Agenţia Naţională de Cadastru şi Publicitate Imobiliară. *Stadiul implementării activităţilor specifice ANCPI la data de 30.09.2020*. http://www.ancpi.ro/pnccf/documente/Nota_privind_activitatea_ANCPI_la_data_de_30.09.2020.pdf. Accesed on October 2020

Comisia Prezidenţială pentru Analiza Dictaturii Comuniste din România. *Raport final*. http://old.presidency.ro/static/rapoarte/Raport_final_CPADCR.pdf. Accesed on October 2020

Eurostat. *Agriculture, forestry and fishery statistics*. 2018 edition. https://ec.europa.eu/eurostat/documents/3217494/9455154/KS-FK-18-001-EN-N.pdf/a9ddd7db-c40c-48c9-8ed5-a8a90f4faa3f. Accesed on October 2020

Institutul Naţional de Statistică. *Recensământul general agricol. Date generale*. Vol. I. http://www.insse.ro/cms/files/GAC/index.htm. Accesed on October 2020

Institutul Naţional de Statistică. *Recensământul general agricol 2010, Rezultate la nivel naţional*. http://www.insse.ro/cms/files/RGA2010/Rezultate%20definitive%20RGA%202010/rezultate%20definitive%20RGA%202010.htm. Accesed on October 2020

Institutul Naţional de Statistică. *Ancheta structurală în agricultură 2016. Date generale la nivel naţional*. Vol. I. http://www.insse.ro/cms/sites/default/files/field/publicatii/ancheta_structurala_in_agricultura_2016_vol1_1.pdf. Accesed on October 2020

RURAL DEVELOPMENT IN BANGLADESH: AN ASSESSMENT OF TRAINING, RESEARCH AND ACTION RESEARCH OF BANGLADESH ACADEMY FOR RURAL DEVELOPMENT (BARD)

Jannatul FERDOUS[1]

Abstract: *Bangladesh is a vast area of rural states. Rural development endeavors for the progress of the value of life in the rural extents with synchronized determinations to expedite the growth, efficiency, and welfare of the populations. Bangladesh is not a beginner in the arena of rural development; somewhat it inbred long years of practices in this arena. Nowadays, rural extents are facing key challenges that arise largely from globalization. The forceful progression of globalization involved in the market economy has been insistently shifting the old thoughts, practices and methods of rural development, predominantly in the developing states like Bangladesh. The Bangladesh Academy for Rural Development (BARD) is a fifty-five years old organization functioning for the rural development sector. A small team of faculty members started the expedition of intense new tracks for development designers and rural development managers with the energetic direction of the first Director Dr. Akhter Hameed Khan. All through the years the academy retained strong effects on rural development. Here, an attempt has been made to measure the performance of BARD in the age of globalization on the ground of Training, Research and Action Research criteria.*

Keywords: *performance, BARD, training, research, action research*

Introduction

Globalization is a course of intensifying trade and business, making commercial boundaries less meaningful around the world (Jora, 2006). The importance of globalization varies for persons, crowds and states. The influence of different worldwide drifts differs on the phase of financial growth of a state, its capital flows, its

---

[1] Assistant Professor. Department of Public Administration, Comilla University, Cumilla-3506, Bangladesh. E-Mail: jannat.lata@yahoo.com

contact to technology, its democratic organizations, or cultural features (Pop et al., 2013). In supplementary arguments, the core of the issue is the "Difference Entrance" to influence, where influence is abstracted as the capability to transfigure physical conditions – whether financial, governmental or societal and to attain objectives grounded on the utilization of wealth, the formation of the rule structure, and the mechanism of setups and establishments. The disparity, the uneven and irregular entrance to the principal organizations, associations and procedures of the new inclusive order have, thus, come under swelling attack (Hussain, 2011). Nowadays, the advanced and developing states are more or less inside the crease of globalization. With its increasing influence of exports and imports, Bangladesh is no exemption to that. Globalization is increasingly prevalent, as many states see their affluence in this process (Jalil, 2011). Followers of globalization assert that the procedure offers prospects for deprived people in developing states to progress their livings and to develop out of poverty, while agnostics state that globalization postures new threats to the welfare of poor societies (von Braun & Mengistu, 2009).

Bangladesh has a population of 161 million, approximately 75% of whom are living in rural extents (Kibria, 2015). Given this high proportion, rural expansion is a vibrant matter for the process of social inclusion. Rural development denotes progress in the welfare of the societies living in the rustic zone (Hossain, 2004; Ignat et al., 2014). Globalization encompasses multilateralism and manifold methods. It is unavoidable in today's atmosphere; there is a crucial necessity to address the socioeconomic aspects that arise as a concern of a universal market economy. Globalization necessitates a procedure of reworking and rearrangement of rural development (Hasan, 2000). BARD is a state organization designated to encourage rural development by research, training and action research. BARD is known both nationally and internationally for its groundbreaking role in emerging, pioneering and sharing tactics in rural development (Jashimuddin et. al, 2005). This paper attempts to measure the performance of BARD on the ground of Training, Research and Action Research criteria.

Objectives of the Study

The objectives of the study are to:

1. Examine the present status of the performance of BARD in research, training and action research;

2. Assess the challenges in the performance of BARD in research, training and action research;

3. Propose some recommendations to overcome the difficulties facing by BARD in research, training and action research.

Methodology

The prevailing study is on the performance of the BARD with special focus on training, research and action research. Performance can be understood as a progress over a period of time. In this situation, the case study method is employed for the purpose of

the paper. Primary data has also been collected directly from the region of the study. The study had utilized two apparatuses for collecting primary data, namely direct observation and interviews. An interview through a uniform questionnaire was steered to collect both quantitative and qualitative information from BARD. The interview was carried out from the first week of August 2016 to middle of September 2016. Thus, the primary outcomes of the comprehensive interviews were carried out to understand the performance of "BARD" on the basis of the interview guide. Purposive sampling is a process where definite units are decisively selected from the choice of the researchers (Aminuzzaman, 2011). There are 60 faculty members in BARD, however, only 39 are attending BARD prevalently. Thus, the size of the sample was chosen at nearly half of the prevailing attendees, hence 20. Table 1 details the number of respondents and their ranks in BARD. Secondary data has been obtained from published documents, such as journals, books, annual reports, research reports and internet browsing.

Table 1: Number of Respondents and Ranks

Rank	Number
Director	3
Joint Director	7
Deputy Director	6
Assistant Director	4
Total	20

Source: author's own representation

Conceptual Clarification

Performance

Performance is frequently defined in output relations, as the attainment of certain given aims (Garcia, 2017). However, performance is not only an issue of what individuals attain, but also of how they attain it (Armstrong, 2006). Performance can thus be approached in two ways. The first is evaluative and denotes the activities that can be referred as adverse, impartial, or constructive for individual and administrative efficiency. The second is multidimensional and denotes that there are many diverse types of activities that have the capability to develop (or obstruct) administrative objectives (Aguinis, 2011). When dealing with performance, both efforts (actions) and productivities (outcomes) need to be measured.

Performance Management

Performance management is a deliberate procedure whose key components are arrangement, dimension, feedback, constructive support and negotiation. It is apprehensive with assessing outcomes in the form of providing performance associated with potentials articulated as goals (Armstrong, 2006).

Globalization

Globalization denotes a progressively assimilated global economy with fewer trade blocks, unobstructed capital movement, cost-effective labor and unrestrictive economy, which infers fewer government involvement (Meraj, 2013). Globalization is mostly based on economic practices concerning trade relationships and market procedures. It is a multifaceted procedure, the nature of which is not entirely assumed. Globalization can have various meanings, providing diverse consequences to diverse states and diverse clusters of people. The exponents, in their opinions for globalization, commonly exclude several of the most vital matters about the welfare of populations, for instance human rights, the liability of military expenditure, dishonesty and traditional distinctiveness, which fall into the cultural and political grounds. The antagonists are apprehensive about undesirable, unanticipated influences of financial globalization, and sense it should be clogged or significantly reformed (Lim, 2005).

Background of BARD

The Academy for Rural Development has been established on the 27th of May 1959 in Comilla (BARD, 1973). BARD began its journey under the active management of Dr. Akhter Hameed Khan, its first Director, small group of faculty members and rural development managers (BARD, 1986). The actual name of Dr. Akhter Hameed Khan arouses a multitude of qualities that are appropriate to a man of his worth. He was a versatile and unusual mastermind, a man of unparalleled devotion and promise, a high personality, a great idealistic humanist with profound affection and kindness for the poor, a commited social scientist, and a master of generating innovation (Bhattacharjee, 2009). BARD is a prominent organization in Bangladesh, involved in training, research and action-research in rural development. Its intents and tasks contain conduct of research and action-research for devising rural development strategies and packages, and training of employees from different government and non-government groups interested in rural development. The Academy has developed numerous groundbreaking rural development programmes and organizations throughout the entire country. BARD has helped policy makers with facts and understanding about the complications of rural development in Bangladesh through its incorporated method of research, training and action-research (Ahmed & Quddus, 1993). BARD established an enduring affiliation with rural people in Bangladesh at large and with those in the Comilla Sadar administrative district in particular. Inhabitants have instinctively and enthusiastically contributed in several experimentations take on by the Academy and thus detonated the mythos about the outmoded traditionalism of the peasantry. The researchers and the Academy, instructors and field workers owe their achievement to these people. They still persist and will stay to continue the significant basis of motivation for the Faculty members of the Academy (BARD, 1991). In the existent days as well, BARD has a vital role to play in the advancement procedure of the state.

BARD is run by a Board of Governors of which the Minister for Local Government, Rural Development and Cooperatives is the Chair. Organizationally, it is involved in the Ministry of Local Government, Rural Development and Cooperatives (Islam et al., 2015). The Board of Governors articulates the policies, and the Director General offers

the power for executing the policies of BARD, as he is the principal executive and is steering the day to day matters, within the context of the Act and the Rules of Service the Academy. He is supported by an Additional Director General. The functions of the Academy are accomplished by its Faculty which includes nine Divisions, each one headed by a Director. The divisions are separated into two sets: Service Divisions and Academic Divisions. The Service Divisions includes Research, Training, Projects and Administration. The Academic Divisions include Rural Sociology, Rural Economics, Rural Administration, Agricultural Development and Rural Education. Yet again, the five Academic Divisions contain several disciplines: Rural Administration, Rural Economics and Rural Business Management, Rural Sociology, Demography and Development Communication, Agricultural Extension and Agricultural Technology, Rural Education and Community Health & Nutrition. There are 60 Faculty members: one Director General, one Additional Director General, nine Directors, 14 Joint Directors, 13 Deputy Directors and 22 Assistant Directors. They are assisted by 305 supportive staff and officials (BARD, n. d.). The Academy has appeared as an organization of an exclusive form uniting training with research and pilot investigation in the arena of rural development. It has been involved in numerous kinds of pilot investigation to discover replicable models of Agriculture, Rural Administration, Cooperatives, Community Health and Nutrition, Women and Youth Works.

Performance of BARD in the Age of Globalization

Rural development is considered as one of the vital policies for development of any state and Bangladesh is not excluded from this issue. In Bangladesh, rural development is profoundly rooted in the BARD. Since the early 1960's, BARD has presented many pioneering resolutions to rural difficulties, helping Bangladesh make significant advancements in rural development (Islam et al., 2015). Offering training, leading research and experimenting innovations are the compulsory tasks of BARD, which has advanced some exclusive models of development administration (Kabir et al., 2004).

Training

The academy is a branded as a national training institute. Its training clientele comprises both of officials and non-officials. Officials involve civil servants, officers of nation building sectors and international candidates of development organizations, whereas the non-officials include the local leaders, councilors and affiliates of co-operatives, learners of educational organizations and associates of voluntary groups. Moreover, a huge figure of imitational clients including scholars, consultants, students, government officials, affiliates of diplomatic corps and imitational organizations visit the academy (Ahsan et. al., 2012).

BARD remains to appeal for trainees from diverse government organizations, local level groups and non-government organizations (NGOs) along with trainees, viewers and guests from overseas. BARD has added huge experience in the arena of training, offering about 120 training courses per year. Moreover, BARD has developed 30 training units under the comprehensive set of rural development. Different courses are

presented on request with a rational budget. For organizing training courses, requests are made to the Director General or Director (Training).

All of the respondents revealed that the target of training can be achieved through the existing setting. The setup of BARD is worthy for organizing training courses. Only 20% of the respondents revealed that the quality of training was not good enough good. They have recommended focusing on the quality of trainings instead of the quantity. Tables 2-4 indicate the performance of the training events of BARD between 2012 and 2015. Against a target of 110 courses, the academy arranged a total of 85 courses, with 3905 participants, compared to the target of 3763 throughout the period of 2012-13.

Table 2: Achievement of Courses, Participants and Man days against Target in the Year 2012-13

Sl. No.	Nature of Course	Target			Achievement		
		Course (No.)	Partici-pants (No.)	Man days	Course (No.)	Partici-pants (No.)	Man days
A.	International Training/ Workshop/ Seminar/ Conference/ Orientation Programme	11	95	990	04	55	231
B.	National Training Course/ Professional Training Course	99	3668	36152	81	3850	3794
	Total	110	3763	37142	85	3905	4025

Source: Ashan et al., 2013

Table 3: Achievement of Courses, Participants and Man days against Target in the Year 2013-14

Sl. No.	Nature of Course	Target			Achievement		
		Course (No.)	Partici-pants (No.)	Man days	Course (No.)	Partici-pants (No.)	Man days
A.	International Training/ Workshop/ Seminar/ Conference/ Orientation Programme	04	31	267	05	41	335
B.	National Training Course/ Professional Training Course	71	3388	34120	79	4100	33120
	Total	75	3419	34387	84	4141	33455

Source: Ashan et al., 2015

Table 4: Achievement of Courses, Participants
and Man days against Target in the Year 2014-15

Sl. No.	Nature of Course	Target			Achievement		
		Course (No.)	Partici-pants (No.)	Man days	Course (No.)	Partici-pants (No.)	Man days
A.	International Training/ Workshop/ Seminar/ Conference/ Orientation Programme	03	45	340	02	31	396
B.	National Training Course/ Professional Training Course	81	3905	39375	86	3620	39174
	Total	84	3950	39715	87	3651	39570

Source: Ashan et al., 2015

The percentage of the attainment in performance of training was about 83% of the objective (Ahsan et al., 2013). In 2013-2014, 84 courses were organized compared to the target of 75. There were 4141 versus the target of 3419 (Table-3). The attainment in the performance of the training events of the academy was 94.78% of the target in this year, greater than that of the earlier year (Ahsan et al., 2015).

Table 4 shows that the performance of the training events of the academy was greater (99.63%) in 2014-2015 than in the preceding year. 87 courses with a total of 3651 participants were conducted. It can be seen that the percentages of attainment of courses and attainment of presence of participants were more than hundred percent in 2013-2014 and in 2014-15. It was 106 percent and 114 percent correspondingly in 2013-14 and 104.70% and 92.43% correspondingly during 2014-15.

Opinion Regarding Training Functions of BARD

Figure 1 presents that 15 (75%) found the performance in the BARD trainings as very good. The reasons behind this were that the outcomes of research and action research were made use of in training; that the annually number of training was good; that differentiated training has been delivered; that international training has been delivered as well; that the annual targets were achieved; that backing to the government and non-government societies was delivered; that attractive allowances were delivered to the trainers; that excellence was confirmed; and that trainings were centered on the needs of the participants. 25% of the respondents expressed that the training performance was good. There were no answers on average, little and not satisfactory choice. Therefore, it can be assumed that, the performance of the training task of BARD was very good.

Figure 1. *Performance of Training Functions of the Academy*
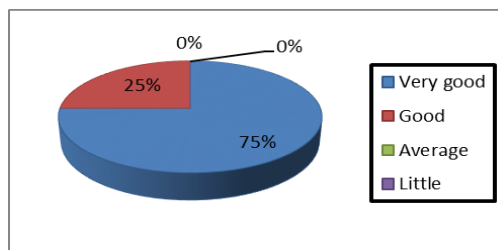
Source: author's field survey, 2016

Research

The Academy has been conducting socio-economic research since its initiation. The findings of the research are utilized as training resources and efforts for beginning action research by the academy itself, and as info ingredients and policy ideas by the Planning Commission, Ministries and Policy Makers for developping programmes. In some specific circumstances, these are well circulated amongst the international organizations and societies (Rahman et. al, 2013). Throughout the last 54 years, Harvard University, Michigan State University, Bath University, Upsala University, Gottingen University, Kyoto University, APDC, UNDP, FAO, UNESCO, JICA, CIRDAP, IDRC and Population Council have become the key international research agents of BARD. The academy is very diligently connected to the Center for Integrated Rural Development for Asia and the Pacific (CIRDAP), as well as to the National IRD Centre in Bangladesh. Moreover, it is functioning for SAARC as the National Liaison Center in the arena of rural development.

Table 5: Summary of Progress of Research Activities during the Year 2012-13

a. Carried Over Research Studies of Previous Year		
1.	Under Course of Publication	02
2.	Ultimate Report Completed	02
3.	Draft Report Writing Phase	03
4.	Improvement Phase as per RD Commentaries	02
5.	Report Sent to CIRDAP	01
6.	Report Sent to Sponsoring Organization	01
7	Others	01
	Total	12
b. Research Studies During the Year 2012-13		
1.	Ultimate Report Submitted	03
2.	Final Report Writing Phase	--
3.	Draft Report Writing Phase	01
4.	Data Collection Finished	01
5.	Data Collection Phase	07
	Total	12
	Grand Total	24

Source: Zahid et al., 2013

The faculty members of BARD have an extensive series of knowledge in the arena of research, training and action research. Moreover, each year BARD conducts researches supported by GOs, NGOs and global organizations. The academy greets desires to conduct research from any organization, domestic or globally. Demands for conducting researches are prepared to the Director General, BARD or Director (Research), BARD. Publications of research are accessible on the publication unit of BARD. Nearly all respondents had an appreciable method about the research effort. They stated that, even some donor supported researches are conducted currently through this academy and this is the best indication of academic standing. Only 25% of the respondents stated that there was a general difficulty in sample size and occasionally probable result cannot be fulfilled for the stress of the desk bound task. The summary of the research activities between 2013 and 2015 is shown in Table 6.

Table 6: Summary of the Progress of Research Studies during
the Year 2013-14 and 2014-15

Sl. No.	Current Status	Number of Researches
1.	Proposal Writing Stage	02
2.	Questionnaire Finalized	02
3.	Data Collection	01
4.	Tabulation Stage	01
5.	Draft Report Writing Stage	04
6.	Submitted to Research Division	01
7.	Draft Report Sent to External Reviewers	01
8.	Sent to Researcher for Improvement	02
9.	Report Improvement Stage	02
10.	Report Submitted to Sponsoring Agencies	03
11.	Process of Printing	02
12.	Report Published	03
	Total	24

Source: Zahid et al., 2015

Opinion Regarding Research Functions of BARD

Figure 2 shows that five respondents found the performance of research tasks of BARD to be very good. The reasons behind their view were that affording to the mandate, the annual number of researches was satisfied; varied researches were completed here; researches were published in journal articles and books; although there were high amounts of work, research activities were going forward and attainments were good. Twelve respondent stated that the performance of research tasks of BARD was as good. The logics behind this were that each year 7 to 10 researches were finished; due to the high amount of work, the speed of research slowed down; sample size was insignificant - without large sample size actual condition could not discover; each year a good quantity of researches were printed; in recent time, donor funded researches have amplified; work was done multi-facet side; quality was not confirmed adequately; government policy persuading research was required. Three respondents expressed that the performance of research of BARD was on average. The logics

behind this were that the researches were not sufficiently pacific and that there was a time restriction to accomplish the research. Nobody saw the performance in research as not satisfactory. Therefore, it can be thought that, the performance of the research activities of BARD was good.

Figure 2. Performance Regarding Research Functions of BARD
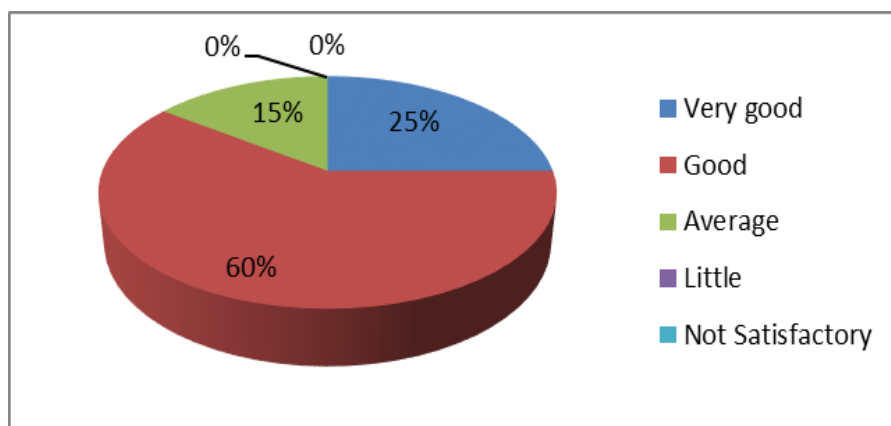
Source: author's field survey, 2016

Action Research

BARD conducts experimental research to advance replicas of upgraded institutes, organizational arrangements, management and approaches of production. The action research events generally include the village dwellers, development organizations, government officials and local councils. Up to now, the Academy has directed more than 50 experimental projects on numerous facets of rural development. BARD has been capable to develop the following rural development models that have previously been replicated all over the state as mechanisms of the Comilla Model through pilot investigations:

a) Two-tier Cooperatives;

b) Thana (Currently Upazila) Training and Development Centre (TTDC);

c) Rural Works Programme (RWP);

d) Thana (Currently Upazila) Irrigation Programme (TIP).

Moreover, the government has been reproducing two current representations of BARD: the Comprehensive Village Development Programme (CVDP) and the Small Farmer and Landless Development Project (Islam et. al., 2015). Table 7 indicates nine continuing action researches of BARD throughout the period 2012-13. Key Four projects were externally supported and two s were under Non-ADP budget.

Table 7: Action Research Projects of BARD (2012-13)

Sl. No.	Category of Projects	Number
1.	Annual Development Programme (ADP)	1
2.	Project Under Non-ADP Budget (PPNB)	2
3.	External Supported Project (ESP)	4
4.	BARD Revenue Project (BRP)	2
	Total	9

Source: Ullah et. al., 2013

The Academy executed five projects throughout 2013-14 and 2014-15, as revealed in Table 8.

Table 8: Action Research Projects of BARD during 2013-14 and 2014-15

Sl. No.	Category of Projects	Number
1.	Annual Development Programme (ADP)	1
2.	External Supported Project (ESP)	2
3.	BARD Revenue Project (BRP)	2
	Total	5

Source: Sharifullah, et. al., 2015

Opinion Regarding Action Research Functions of BARD

Figure 3 shows that two respondents found the action research of BARD to be very good. The reasons behind as stated by the respondents were that the action researches of BARD were the backbone of the institution. Two respondents stated that the performance of action research tasks of BARD was good. The reason behind this was that BARD was doing action research, but it is subject to government process and government provision of fund in action research which goes through an extended and timely process, identified as problematic. Twelve respondents (60%) stated the performance of action research tasks of BARD as average. The causes behind their view were that the government did not deliver finance to BARD; no prominence was provided for the proposal of projects submitted by BARD. Five respondents (25%) expressed that performance of action research tasks of BARD was poor (little). The reasons behind this were that throughout the last seven or eight years, BARD had not gotten government reserves in new assignments; there was difficulty throughout the project approval process of government; no wide-ranging project was available and poor connection with the donor funding organization.

Figure 3. *Performance Regarding Action Research*
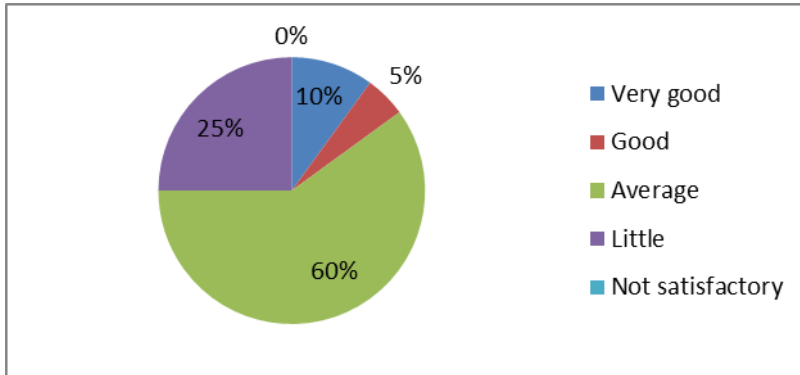
Challenges of BARD According to its Activities in the Age of Globalization

A Yes/No question was asked whether the contemporary performance of BARD is compatible in the globalized world. Figure 4 shows that 15 (75%) respondents stated "no" and that 5 (25%) stated "yes". Therefore, it can be assumed that BARD should make more efforts to improve compatibility in the globalized world.

Figure 4. *Opinion Regarding Compatibility in the Globalized World*
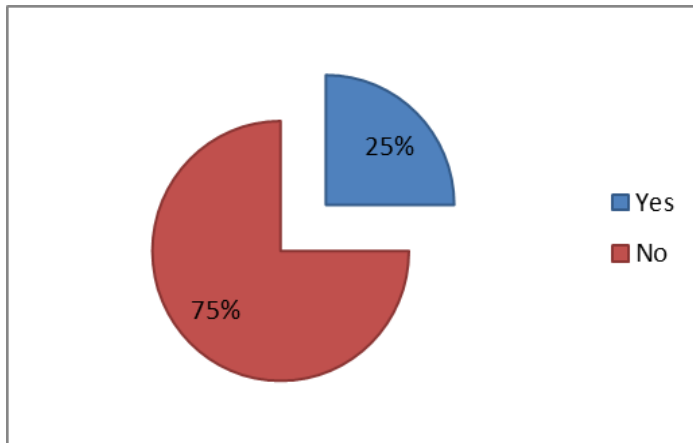
Several reasons were also provided on why BARD was perceived as incompatible in the globalized world, as depicted in Table 9.

Table 9: Opinions regarding the Incompatibility of BARD in the Globalized World

Sl. No.	Opinion	Number of Respondents	Percentage (%)
1.	Insufficient expert faculty	6	30%
2.	Lack of suitable people in suitable field	1	5%
3.	Poor technological provision	3	15%
4.	Poor international connection	8	40%
5.	Lack of vision	2	10%
6.	Deficiency of professionalism of the faculty	1	5%
7.	Lack of spontaneousness	1	5%
8.	Lack of international knowledge	1	5%

Source: Author's field survey, 2016 (N.B.: multiple answers recorded)

Table 9 discloses that there are numerous causes behind the incompatibility of BARD in the globalized world. Eight respondents mentioned the poor international, while six the lack of sufficient of expertise of the faculty. Poor technological provision has been cited by three respondents, while two have named the lack of vision. The other matters got single answers.

Rural development can be provocative in a globalized world. Yet, we still have a solid belief in Dr. Akhter Hameed Khan's viewpoint, principally his importance on the cooperative power and understanding. To cope with this kind of intricate social dynamics, involvement is the best method to continue. Keeping this in mind, BARD retains up its practice of participatory improvement and upholds frankness on work that helps to develop good relationships with a wide range of clients as well. It has been discovering challenges along with opening up new opportunities for promotion of rural products and how associations could be a key player in this respect. Permitting to the opinion articulated by the respondents, some key challenges about this study are given next:

For the Research Function Perspective

a) There are some difficulties of area / field choice (small sample size or narrow extents).

b) Timing difficulty for lots of desk-bound work and other internal events.

c) Very few rooms for comparative studies with other link organizations.

d) Research yields are not highlighted in the policy making layer.

e) There is no proficiency in contemporary technology centered research.

f) Allowance for the researcher is not adequate enough to make a good effort.

g) Inadequate quantitative analysis.

For the Action Research Function Perspective

a) Lack of skills for project approval procedure.

b) Deficiency of time management for funding procedure from the government.

c) Be contingent on government's choice and approach.

d) Insufficient manpower.

e) Nonappearance of harmonization between pertinent ministry and academy.

For the Training Related Challenges Function Perspective

a) Deficiency of Training Need Assessment (TNA) procedure.

b) Lack of e-learning procedure.

c) Insufficient ICT associated apparatus and backdated arrangement.

d) Insufficient manpower.

e) Need some capability building projects for self-improvement.

Looking Forward for Better Performance

The study showed that BARD attained its objectives in training courses. However, excessive quantities of training courses and numbers of trainees may decline the quality of training. It is essential to confirm quality. There is a need for more proficiency and a need for a more capable trainer as well. E-learning skills and ICT technology are needed for enhanced training. In terms of research, it is important to increase the allowances so as to better motivate the researchers. The extent of research is essential to be comprehensive to get superior findings. Prominence needs to be given to contemporary technology-centered research. In the matter of the action research, finance is most important, accompanied by a necessity of knowledge of the project approval procedure, ample manpower and appropriate harmonization between the pertinent ministries and the Academy.

Conclusions

Dynamic forces of rural development in Bangladesh have transformed vastly in a globalized world. At present, globalization is usually acknowledged as an appealing force distressing many facets of human life. Unhindered trade, extraordinary progress of Information and Communications Technologies (ICTs) and a combination of socio-cultural aspects through the world seem to be key concerns of globalization. So as to combat the condition, the pressures have to be apportioned and prospects grabbed. The forceful progression of globalization together with the market economy has been insistently shifting the ancient ideas, performs and arrangements of rural development, particularly in the developing states (Rahman, 2014). BARD is globally admired for its

many groundbreaking mechanisms in the arena of rural development in Bangladesh. The Comilla model of Rural Development, a set of reciprocally helpful models of development, formed durable influences on altering the survival and living situation of the rural underprivileged people. As the majority of Bangladeshi live in rural areas, it is vital to create a possibility to work with so many people. The swiftly shifting worldwide inclusive development situation has introduced a new philosophy about rural development events, importance and planning procedures. Through this strategic blueprint, a strong will is extremely essential to support BARD and deal with the shifting conditions in the globalized world.

References

Aguinis, H. (2011). *Performance Management*. New Delhi: Dorling Kindersley India Pvt. Ltd.

Ahmed, S., & Quddus M. A. (1993). *A Framework for Future Activities of BARD: Background Work Plan & Strategies for Implementation*. Comilla: BARD.

Ahsan, K., Quader, M. A., Paul, J. R., & Islam, M. N. (2013). *Annual Report on Training: 2012-13*. In: M. M. Rahman, M. A. H. Bhuyan, & A. Mahmuda (Eds.), Annual Report 2012-2013 (pp.3-32). Comilla: BARD.

Ahsan, K., Munshi, S. K., Sultana, F. N. & Nahar, S. (2015). *Annaul Report on Research 2013-14 & 2014-15*. In: M. S. Islam, M. A. Taleb, & F. Yeasmin, (Eds.) Annual Report 2014-2015 (pp. 4-58). Comilla: BARD.

Ahsan, K., Rahman, M. M. & Rahim, J. (2012). *Annual Report on Research*. In: Chowdhury, M. H., Munshi, S. K. and Khan, A. (eds.). Annual Report 2010-2011. Comilla: BARD.

Aminuzzaman, S. M. (2011). *Essentials of Social Research*. Dhaka: Osder Publications.

Armstrong, M. (2006). *Performance Management Key Strategies and Practical Guidelines*. London: Kogan Page.

BARD (1973). *Bangladesh Academy for Rural Development, Kotbari, Comilla: A Brief Review*. Comilla: BARD.

BARD (1986). *Silver Jubilee 1959-1985*. Comilla: BARD.

BARD (1991). *Bangladesh Academy for Rural Development: An Introduction*. Comilla: BARD.

BARD (n. d.). *Facilities at BARD*. Comilla: BARD.

Bhattacharjee, M. K. (2009). *Dr. Akhter Hameed Khan: A Master of Making the Past Work for the Present*. In: BARD (ed.): Shuborno Joyonti Swarok Grontha. Comilla: BARD.

Garcia, R. C. (2017). Profitability and efficiency evaluation of the financial management of a socio-economic intervention. *Management & Marketing. Challenges for the Knowledge Society*, 12(2), 316-333.

Hasan, M. K. (2000). *Globalisation and Its Implications for Rural Development*. In: Barua, B. K. (ed.): Current Thoughts on Rural Development. Comilla: BARD.

Hossain, M. (2004). Poverty alleviation through agriculture and rural development in Bangladesh. *CPD Occasional Paper Series*, 39.

Hussain, S. M. A. (2011). Challenges of Globalization: How Bangladesh Can Adapt Itself to Reap the Best Benefits in the 21st Century. *MIST Journal: GALAXY (DHAKA)*, 3.

Ignat, R., Stoian, M., & Roşca, V. (2014). Socio-economic Aspects of rural Romania. *Procedia Economics and Finance*, 15, 1331-1338.

Islam, M. S., Taleb, M. A., & Yeasmin, F. (eds.) (2015). *Annual Plan (2015-16)*. Comilla: BARD.

Islam, M. S., Taleb, M. A., & Yeasmin, F. (eds.). (2015). *Annual Report 2014-2015*. Comilla: BARD.

Jalil, D. (2011). *Globalization and its impact on Bangladesh economy*. State University of Bangladesh.

Jora, O. D. (2006). Might the Globalization Button Turn the European Social Bohemia off?. *Romanian Economic Journal*, 9(21), 95-100.

Kabir, M. K., Quader, M. A., & Guha, R. K. (eds.) (2004). *Annual Report (2002-2003)*. Comilla: BARD.

Kibria, G. 2015. Sustainable energy for Rural Development in Bangladesh- Economic, Social and Environmental Benefits of Renewable energy. *Sydneybashi-Bangla, Australia; Science & Technology*, Article 37.

Jashimuddin, M., Bhattacharjee, M. K., & Rahman, M. M. (2005). *Annual Plan (2004-2005)*. Comilla: BARD.

Lim, G. C. (2005). *Globalization, spatial allocation of resources and spatial impacts: A conceptual framework*. In: Globalization and Urban Development (pp. 13-27). Berlin/Heidelberg: Springer.

Meraj, M. (2013). Impact of globalization and trade openness on economic growth in Bangladesh. *Ritsumeikan Journal of Asia Pacific Studies (RJAPS)*, 32, 40-50.

Pop, N. A., Drăghescu, F., & Roşca, V. (2013). Global competition and Romania's national competitive advantage. *The Annals of the University of Oradea. Economic Sciences, Tom XXII*, 1807-1814. ISSN 1582-5450.

Rahman, M. M., Bhuyan, M. A. H., & Mahmuda, A. (eds.) (2013). *Annual Report 2012-2013*. Comilla: BARD.

Rahman, M. M. (2014). Threats and Opportunities of Globalization for Rural Development: Bangladesh Perspectives. *Thai Journal of Public Administration*, 12(1), 31-31.

Sharifullah, A. K., Guha, R. K., Khan, A. and Mahmud, R. (2015). *Annual Report on Action Research*. In: M. S. Islam, M. A. Taleb, & F. Yeasmin (Eds.): Annual Report 2014-2015. Comilla: BARD.

Ullah, A. K. S., Islam, M. S. and Mahmuda, A. (2013). *Annual Report on Action Research: 2012-13*. In: M. M. Rahman, M. A. H. Bhuyan, & A. Mahmuda (Eds.): Annual Report 2012-2013. Comilla: BARD.

von Braun, J., & Mengistu, T. (2009). *Poverty and the Globalization of the Food and Agriculture System*. In: J. Von Braun, R. E. Hill, & R. Pandya-Lorch (Eds.): The Poorest and Hungry: Assessments, Analyses, and Actions. International Food Policy Research Institute (pp. 171-178).

Zahid, S. J. A., Rahman, M. M. & Rahim, J. (2015). *Annual Report on Research 2013-14 & 2014-15*. In: M. S. Islam, M. A. Taleb, & F. Yeasmin (Eds.): Annual Report 2014-2015 (pp. 59-83). Comilla: BARD

EVOLUTION OF FOOD CONSUMPTION PATTERNS AT GLOBAL LEVEL OVER THE LAST FIVE DECADES

Mariana STANCIU[1]

Abstract: *The promotion of healthy diets and lifestyles plays an important role in increasing the quality of life, in increasing the life expectancy of the population, in reducing the general morbidity and mortality. The agriculture and food industry sectors have a decisive importance in ensuring the supply of food goods, but equally important are other economic factors that condition the food consumption (population income level, price level, volume and quality of food service supply, habits/opportunities of consumption, preferences and believes, cultural traditions and so on). This article presents some of the main changes registered by the food consumption patterns at global level during the last half of the century. The main chapters of the food consumption patterns considered are the following: the evolution of energetic expression of food consumption, trends in fat consumption, consumption of animal products tendencies, availability and consumption of fish, availability and consumption of fruits and vegetables, the evolution and forecasting of prices. In the concluding chapter is presented also the general expectation regarding food availability and consumption until 2030. The data used here are published by different specialized international institutions like FAO, WHO, WTO or others.*

Keywords: *nutrition, trends, changing, supply, demand*

Introduction

Food is the main source of energy and of nutrition for any living beings and may be usually of animal or plant origin. There are four basic food energy sources: fats, proteins, carbohydrates, and alcohol. Humans are omnivorous beings and consume both plant and animal products.

The food strategies of the states usually aim to ensure food security and safety for social communities, from the perspective of dominant consumption patterns manifest in the social spaces of reference in the respective communities or nations. Within food

---

[1] Senior Researcher, The Research Institute for Quality of Life, Romanian Academy, e-mail: mariana3stanciu@gmail.com

strategies, recommendations have implications in the structure of food chains and can influence population access to basic foods.

The economic development of a country should induce, progressive improving of the food supply including by increasing the quality of the profile services, with consequences in the gradual elimination of deficiencies and deficits of nutritional content of the diets. Thus, the improving of the general nutritional balance of a population might be a goal for a shorter or a longer term because it involves some quantitative but especially qualitative changes in the production, processing, distribution, and marketing of food.

The intensification of urbanization is a factor with major consequences on the dominant food patterns and lifestyles of the peoples. The dynamics of manifesting food consumption decisions as well as some preferences that intervene in the eating behavior of a population, related with specific patterns of employment, or with some models of spending leisure time - can generate some consistent causes of illness for some segments of the population. It is well-known also that accessing either poor or excessive food intakes may generate nutritional disbalances which might mean different nutritional illnesses. Nutrition is a science too expensive to be ignored, if the health of a population is concerned.

FAO publishes annual reports containing food balances and thus provides national food availability data (for almost all goods and for almost all countries).

The food balance sheets provide a complete picture of the supply (production, imports, changes in stocks and exports) and the use of goods (including final demand in the form of food use and non-food industrial use, intermediate demand, such as feed and seed use, and food waste management). From this data, the average supply per inhabitant of macronutrients (energy, proteins, fats) for all foods can be obtained. Although an average supply per inhabitant may be calculated on the basis of national data, the offer refers less to the actual availability of food per inhabitant, as this is also determined by other factors, such as, for example, inequality of access to food of different categories of consumers.

On the other hand, food products available for consumption, for several reasons (for example, the generation of food waste at the household level), cannot be considered equal to food consumption. Therefore, terms such as "food consumption" or "food intake" actually mean "food available for consumption."

Actual food availability may vary by region, socioeconomic level, and season. Some difficulties might be encountered in estimating the changes that occur in the trade, production, and stocks of foods at the level of one year. Therefore, these calculations consider three-year averages to reduce errors.

Energetic expression of food consumption

In the last half of the century, the world has made significant progress in increasing food availability. Food consumption expressed in kilocalories (kcal) per inhabitant per day is a key variable used to dynamically assess the global and regional food situation.

Table 1. Global and regional food consumption per inhabitant
(kcal per inhabitant per day)

Region	1964-1966	1974-1976	1984-1986	1997-1999	2015	2030
Global level	2358	2435	2655	2803	2940	3050
Developing countries	2054	2152	2450	2681	2850	2980
Near East and North Africa	2290	2591	2953	3006	3090	3170
Sub-Saharan Africa*	2058	2079	2057	2195	2360	2540
Latin America and the Caribbean	2393	2546	2689	2824	2980	3140
East Asia	1957	2105	2559	2921	3060	3190
South Asia	2017	1986	2205	2403	2700	2900
Industrialized countries	2947	3065	3206	3380	3440	3500
Countries in transition	*3222*	*3385*	*3379*	*2906*	*3060*	*3180*

* Excludes South Africa

Source: Global and regional food consumption patterns and trends, FAO, 2003

But maybe, a more appropriate term for this variable would be the apparent national average food consumption because the data come from national food balance sheets, rather than from food consumption surveys.

FAOSTAT data attests that, globally, between 1964-2015, food intake in caloric expression, has increased steadily; the availability of calories per capita from the mid-1960s to the end of the 1990s increased globally by approximately 450 kcal per capita per day and by over 600 kcal per capita per day in developing countries (Table 1).

But this dynamic has been clearly differentiated between regions. Caloric intake per inhabitant was almost stagnant in sub-Saharan Africa and, during the 1990s, declined in countries in economic transition. In contrast, the caloric intake per inhabitant increased massively in East Asia (with almost 1000 kcal per inhabitant per day, mainly in China) and in the Near East / North Africa (over 700 kcal per inhabitant per day).

The increase in food consumption globally was accompanied by significant structural changes and a change in diets in relation to some products, such as roots or tubers, in order to increase the consumption of products of animal origin and vegetable oils (Tables 3 and 4). Table 1 shows that the energy supply varied, in 2015 from 2850 kcal per inhabitant in developing countries, to 3060 kcal per capita per day in transition countries and 3440 kcal per inhabitant in industrialized countries.

Table 2. Plant or animal energy sources in the diet (kcal per capita per day)

Region	1967 - 1969			1977 - 1979			1987 - 1989			1997 - 1999		
	T	V	A	T	V	A	T	V	A	T	V	A
Developing countries	2059	1898	161	2254	2070	184	2490	2248	242	2681	2344	337
Countries in transition	3287	2507	780	3400	2507	893	3396	2455	941	2906	2235	671
Industrialized countries	3003	2132	871	3112	2206	906	3283	2333	950	3380	2437	943

Note: T- total kcal; V- kcal of vegetable origin; A - kcal of animal origin (including fish)

Source: ***Global and regional food consumption patterns and trends, FAOSTAT, 2003

Between 1967-1999, the caloric intake per inhabitant / day from animal and / or vegetable sources, in transition countries decreased, while in developing countries, but especially in industrialized countries, it increased (table 2). The caloric availability of animal type has become somewhat more balanced in developing and industrialized countries, meaning that the ratio of kcal / capita / day in industrialized countries / developing countries decreased from 5.4 in 1967- 69 to 2.8 in 1997-99.

Similar trends were observed regarding protein availability; it has grown in both developing and industrialized countries but has decreased in transition countries. Although the global supply of protein has increased, the distribution of increased protein intake has been uneven. The supply per inhabitant with vegetable protein was slightly higher in developing countries, while the supply of animal protein was three times higher in industrialized countries.

The main types of cereals consumed in the dominant pattern of consumption al global level are *rice* and *wheat,* whose added consumed quantities has grown from 800 to over 1,000 kcal per capita, after the year 1980, on the background of the demographic increase (since the early 1960 world`s population has doubled until 2020, at 7.8 billion (Hannah Ritchie and Max Roser, 2020).

Graph 1. *The weight of the energy diet derived from cereals*
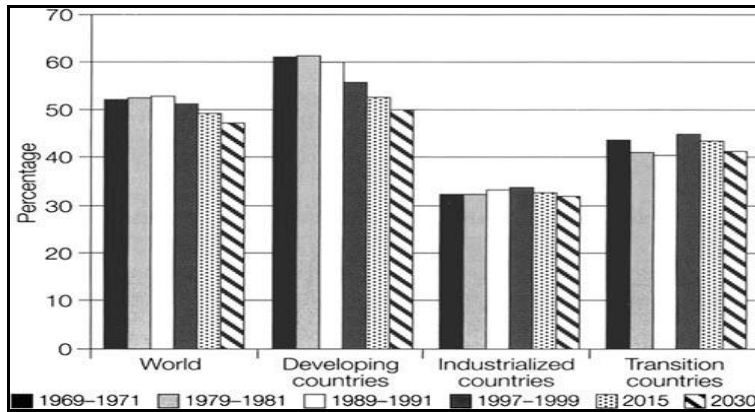
Source: *** World agriculture: towards 2015/2030. Summary report. Rome, Food and Agriculture Organization of the United Nations, 2002

Globally, the share of caloric intake of cereals seems to have remained relatively stable over time, accounting for about 50% of total caloric intake (Graph 1).

However, some subtle changes have taken place. An analysis of food energy intake shows its decrease in developing countries, where the share of energy derived from cereals has decreased from 60% to 54% over a period of only 10 years. Much of this downward trend is attributed to cereals, especially wheat and rice, which are becoming

less preferred foods in middle-income countries, such as Brazil and China, and this pattern is likely to continue to be structured until 2030.

Trends in fat consumption

Fat is a generic term for a class of lipids, that are produced by organic processes both in animals and plants. Saturated fats include animal fats (e.g. milk fat, lard, tallow), and palm oil, coconut oil, cocoa fat, and hydrogenated vegetable oil. Vegetable fats, coming from olive, peanut, maize (corn oil), cottonseed, sunflower, safflower, and soybean, are predominantly unsaturated. Both vegetable and animal fats contain saturated and unsaturated fats. Some oils (such as olive oil) contain in majority monounsaturated fats, while others present quite a high percentage of polyunsaturated fats (sunflower, rape)[1]

Increasing the quantity and quality of fat consumption is an important feature of the nutritional transition reflected in the national diets. There are large differences between the regions of the world in terms of the total amount of fats (fats in food plus added fats and oils) available for human consumption. The smallest quantities consumed are registered in Africa, and the largest consumption occurs in parts of North America and Europe. There has been a remarkable increase in fat consumption during 1967-1999 (Table 3), practically everywhere excepting Africa, where consumption levels have stagnated. The fat intake per inhabitant of animal feed increased by 14 g per inhabitant in developing countries and by 4 g per inhabitant in industrialized countries, while in the transition countries this type of consumption decreased 9 g per inhabitant.

Regarding human nutritional needs, proteins come in two forms: *complete proteins* which contain eight amino acids that humans cannot produce themselves, and *incomplete proteins* which contain only a small proportion of one or more amino acids. Humans' bodies can use all the amino acids they extract from food for synthesizing new proteins, but some of the inessential ones need not be supplied by the diet, because our cells can make them ourselves. Animal-derived foods contain all those amino acids, while plants are typically stronger in some acids than others. Complete proteins can be made in an all vegan diet by eating a sufficient variety of foods and by getting enough calories. Protein deficiency can lead to different symptoms such as fatigue, hormonal irregularities, insulin resistance, loss of muscle mass, low body temperature and others. Severe protein deficiency may be fatal [2]

The increase in fat intake worldwide has exceeded the increase in protein intake. The global average fat intake increased by 20 g per capita per day, from 1967 to 1999. This increase in fat availability was more pronounced in America, East Asia, and the European Community. The proportion of energy with which food fats contributed has exceeded 30% in industrialized regions, and in almost all other regions this weight has increased (fat-energy ratio (FER) is defined as the percentage of energy derived from fats in the total energy supply (The analysis of FAO data for each country between 1988 and 1990 revealed a range for FER of 7-46%. A number of 19 countries

---

[1] Food Molecules (2020), available at https://www.worldofmolecules.com/foods/
[2] Food Molecules (2020), available at https://www.worldofmolecules.com/foods/

fell below the minimum recommendation of 15% of the food energy from fats, most of them being countries. from Sub-Saharan Africa, and the rest from South Asia (FAOSTAT, 2003). Instead, 24 countries exceeded the maximum recommendation of 35%, most of them from North America and Western Europe. The data limits in the food balances have skewed. probably some variations of FER from different countries. For example, for Malaysia, which has an abundance of low-priced vegetable oils, the data b food balance may not reflect actual consumption at the individual household level. Increased incomes in the developing world have led to increased fat availability and consumption.

Food balance data can be used to examine the change in the proportion of fat intake over time and its relationship with income growth (Guo X et al., 2000).

Table 3. Trends in dietary fat intake

Region	Fat intake (g per capita per day)				
	1967-1969	1977-1979	1987-1989	1997-1999	Growth between 1967 and 1999
Global level	53	57	67	73	20
North Africa	44	58	65	64	20
Sub-Saharan Africa*	41	43	41	45	4
North America	117	125	138	143	26
Latin America and the Caribbean	54	65	73	79	25
China	24	27	48	79	55
East and Southeast Asia	28	32	44	52	24
South Asia	29	32	39	45	16
The European Community	117	128	143	148	31
Eastern Europe	*90*	*111*	*116*	*104*	*14*
Near East	51	62	73	70	19
Oceania	102	102	113	113	11

Note: * Excludes South Africa

Source: FAOSTAT, 2003.

Between 1961-1963, a diet that provided 20% of energy from fats was associated only with countries that had at least a GNP per capita of $ 1475. Until 1990, however, even the poor countries that had a GNP in place. only US $ 750 had access to a similar diet comprising 20% of energy from fats (both GNP values are expressed in USD $ 1993.) This change was mainly the result of increased vegetable fat consumption in poor countries, and of smaller increases in middle- and high-income countries. Until 1990, vegetable fats had a higher caloric intake than animal fats for the countries with the lowest incomes per inhabitant. Changes in the supply of edible vegetable oils, changes in prices and consumption affected both rich and poor countries, but the net impact was higher in low-income countries (Drewnowski A, Popkin BM., 1997).

In 2010, mean global saturated fat intake in adults was 9.4% of energy intake, with marked variation across regions and countries. Highest intakes were identified in Samoa and similar palm oil producing island nations, as well as Sri Lanka, Romania, and Malaysia. Lowest intakes were in Bangladesh. In 75 of 187 countries, representing

2.73 billion adults and 61.8% of the global adult population, mean consumption was <10% of energy intake[1]

Worldwide 2010, omega 6 polyunsaturated fat mean intake was 5.9% of energy intake with approximately 3-fold variation between highest (8.5% of energy intake) and lowest (2.5% of energy intake) regions. Country-specific intake ranged from 1.2% of energy intake to 12.5% of energy intake. Highest intake was in Bulgaria. The lowest intakes were in Kiribati, Samoa, and Vanuatu. Only one of 187 countries (Bulgaria) had intakes at or above the optimal level of 12% of energy intake. Only 94 of 187 countries had intakes at or above 5% of energy intake, representing 2.3 billion adult people and 52.4% of the world adult population[2]

Globally 2010, *mean dietary cholesterol intake* was 228 mg/day. Across the Global Burden of Diseases Study regions, roughly 2.4-fold differences were identified, and across countries 4.5-fold differences (from 97 to 440 mg/day). Romania, and other Eastern European nations, such as Latvia and Belarus, as well as Algeria, Paraguay, Japan, and Hungary had highest consumption. Lowest intakes were in Bangladesh, Nepal, other South Asian nations, and East Sub-Saharan African nations such as Rwanda and Burundi. Overall, 155 of 187 countries had mean cholesterol consumption <300 mg/day, in line with current recommendations, representing 3.9 billion adults and 87.6 % of the world adult population. Both regionally and nationally, dietary cholesterol did not strongly correlate with saturated fat consumption[3]

Globally 2010, *mean intake of seafood omega 3 fats* was 163 mg/day, with tremendous regional variation (from <50 to >700 mg/day) and national variation (from 5 to 3886 mg/day). Highest intakes were identified in island nations including Maldives, Barbados, the Seychelles, and Iceland, as well as in Malaysia, Thailand, Denmark, South Korea, and Japan. Lowest intakes were in Zimbabwe, Lebanon, the Occupied Palestinian Territory, Botswana, and Guinea-Bissau. In 45 of 187 countries mean intakes were ≥250 mg/day, in line with current guidelines. Notably, 100 nations had very low mean consumption (<100 mg/day), generally in Sub-Saharan African and Asian regions as well as North Africa/Middle East, representing three billion adults and 66.8% of the world adult population. *Mean plant omega 3* consumption was 1371 mg/day, with a 10-fold range (302 to 3205 mg/day) across regions. By country, intake ranged from <100 to >3000 mg/day. High consumption was seen in Jamaica, China, the UK, Tunisia, Angola, Senegal, Algeria, Canada, and the US. Low intakes were found in Israel, the Solomon Islands, Sri Lanka, Comoros, Saint Lucia, and the Philippines. Although we did not identify sufficient evidence to set a specific optimal intake level for preventing chronic diseases, World Health Organization guidelines suggest mean population plant omega 3 consumption of ≥0.5% of energy intake, or ≥1100 mg for a 2000 kcal/day diet. Based on this, 52 of 187 countries met this intake. Among the 135 countries with lower consumption, 61 had intakes <500 mg/day, substantially below

---

[1] Global Burden of Diseases Nutrition and Chronic Diseases Expert Group (NutriCoDE) (2014)
[2] Ibidem
[3] Ibidem

current recommendations, representing 800 million adults and 17.8% of the global adult population [1]

Steady growth in the consumption of animal products

Globally, there has been increasing pressure on the economy of the livestock sector to respond to the increasing demand for animal protein. The global livestock sector has grown at an unprecedented rate, the driving force of this growth being a combination of global population growth, income growth and urbanization. And the forecasts indicate a further increase in annual meat production from 218 million tons in 1997-1999 to 376 million tons by 2030.

There is a strong correlation between the level of income and the consumption of animal protein, the consumption of meat, milk and eggs increasing on the expense of discontinued foods. Due to the increase of the accessibility of prices, developing countries realized a higher consumption of meat at much lower levels of GDP compared to the industrialized countries 20-30 years ago.

Table 4. Food of animal origin - consumption per capita

Region	Meat (kg per year)			Milk (kg per year)		
	1964-1966	1997-1999	2030	1964-1966	1997-1999	2030
Global level	24,2	36,4	45,3	73,9	78,1	89,5
Developing countries	10,2	25,5	36,7	28,0	44,6	65,8
Near East and North Africa	11,9	21,2	35,0	68,6	72,3	89,9
Sub-Saharan Africa*	9,9	9,4	13,4	28,5	29,1	33,8
Latin America and the Caribbean	31,7	53,8	76,6	80,1	110,2	139,8
East Asia	8,7	37,7	58,5	3,6	10,0	17,8
South Asia	3,9	5,3	11,7	37,0	67,5	106,9
Industrialized countries	61,5	88,2	100,1	185,5	212,2	221,0
Countries in transition	42,5	46,2	60,7	156,6	159,1	178,7

Nota: * Excludes South Africa

Source: FAOSTAT, 2003.

Urbanization has also strongly influenced the global demand for food stuffs of animal origin. The urbanization stimulated some infrastructure developments, which allowed the creation of cold chains of food transport and conservation, which allowed a modern trade with perishable goods. Compared to the less diversified diets of rural communities, city dwellers have more varied diets, richer in animal protein and fat and characterized by higher consumption of meat, milk and dairy products. Table 4 presents the consumption trends per inhabitant of animal products in different regions and groups of countries. In this regard, there has been a remarkable increase in consumption in countries such as Brazil and China, although levels are still well below

---

[1] Global Burden of Diseases Nutrition and Chronic Diseases Expert Group (NutriCoDE) (2014)

the level of consumption in North America and in most industrialized countries. Over time, there has been a general tendency for diets to become richer and more diverse, because of the high-value protein that the livestock sector has offered. Animal products provided high-value proteins, while being important sources of a wide range of essential micronutrients, especially minerals such as iron and zinc, but also vitamins such as vitamin A. However, for a large part of the world's population, especially in the developing countries, the products of animal origin are still deficient foods from the perspective of the balance of the diet. În the same time, the statistical consumption of products of animal origin in some countries and social classes has allowed, however, an excessive intake of fats in the diet of very large categories of population.

The growing demand for animal products also had an adverse impact on the environment. The continuously growing production of the food industry, often located close to urban centers, also involved several risks to the environment and public health. It has been tried to estimate the environmental impact of the food industries. Thus, it has been estimated that the number of people fed per year per hectare varies from 22 for potatoes and 19 for rice to 1 and 2, respectively for beef and lamb (FAOSTAT, 2003).

Consumption of fish evolution

Despite the changes in demand and supply of fish determined by the dynamics of such resources, the economic climate and environmental conditions, fishing, including aquaculture, has traditionally been and remains an important source of food, jobs and incomes in many countries and communities. Following the massive increase of both inland and marine fish catches in the 1950s and 1960s, world fishery production has declined massively. This reduction followed the general tendency of most of the fishing areas in the world to exploit the maximum available fishing potential. As a result, there was very little opportunity to increase the production of fish caught. In contrast, aquaculture (inland and marine) production, starting from insignificant values, increased at a remarkable rate, offsetting some of the reduction in fish catches in the ocean (Lewis B, Assmann G, eds. 1990; Pimental D. et. al., 1997). Under such conditions, the total supply of fish food and, consequently, the consumption, increased with rates of around 3.6% per year from 1961, while the population of the world increased by 1.8-2% per year. Proteins derived from fish, crustaceans and molluscs accounted for 13.8% to 16.5% of the animal protein intake from the diet of the global population. The average consumption/ inhabitant increased from about 9 kg per year in the beginning of 1960 to 16 kg in 1997 and exceeding 20 kg of fish in 2016. The availability of fish and fishery products per capita has doubled in almost 40 years, surpassing the population growth (FAOSTAT, 2003; Ion Monica, 2016).

However, although some progress has been made in regenerating marine fish resources, the overall state of marine resources in the world has not improved radically. The FAO report *(FAO, 2016)* mentions that almost one third of commercial fish stocks are fished at biologically unsustainable levels, which is a triple percentage point to 1974. The overall fish production captured in 2014 was 93.4 million tons, including inland water production, which is slightly higher than two years ago. Alaska's black cod was the top

species, replacing anchovies for the first time in 1998. Record-breaking catches were reported for four extremely valuable groups in 2014 - tuna, lobsters, shrimps, and cephalopods, when there were around 4.6 million fishing vessels worldwide in 2014, of which 90% in Asia and Africa. Globally, fish provided 6.7% of all human-consumed protein, providing a rich source of omega-3 fatty acids, vitamins, calcium, zinc and iron.

At global level, about 57 million people were employed in the primary fish production sectors, one third of them in aquaculture. Fishery products accounted for a percentage of the total value of global trade in goods, which is equivalent to more than 9% of total agricultural exports. Worldwide exports totaled $ 148 billion in 2014 compared to $ 8 billion in 1976. Developing countries were the source of US $ 80 billion worth of fish exports, delivering net trade revenues higher than those of meat, tobacco, rice, and sugar added.

The role of fish in food models is different from one continent to another, but also at regional and national level. In industrialized countries, where diets generally contain a more diverse range of animal protein, there has been an increase in fish intake per inhabitant from 19.7 kg to 27.7 kg. This means a growth rate of close to 1% per year. In this group of countries, the fish contributed with an increasing share to the total protein intake until 1989 (representing between 6.5% and 8.5%), but since then its relative importance has gradually decreased, and by 1997, that contribution reached again the values of the mid-80s.

At the beginning of the 1960s, the supply of fish, per inhabitant, in countries with a food deficit, because of the low incomes was, on average, only 30% of that of to the richest countries. This gap was gradually reduced, so that in 1997 the average consumption of fish in such countries was 70% of that of the richer economies. Despite the relatively low consumption of food in countries with deficit due to relatively low incomes, the total contribution of animal protein from fish was considerable (almost 20%). Over the last five decades, however, the share of fish protein in animal protein has decreased slightly, due to the faster increase in consumption of other animal products. Currently, two thirds of the total fish supply come from the catch fishery in inland and marine waters, while the remaining one third is derived from aquaculture. The contribution of inland and marine capture fisheries to food supply per inhabitant has stabilized, around 10 kg per inhabitant in the period 1984-1998. Any more recent increase in availability per inhabitant was, therefore, obtained from the production of traditional, rural aquaculture, but also from intensive commercial aquaculture of high-value species.

In general, fish contribute up to 180 kcal per capita per day, but reach such high levels only in a few countries where locally grown alternative protein foods are lacking or where there is a strong preference for fish (in Iceland, Japan and some small states). Typically, fish provide about 20-30 kcal per inhabitant per day.

Fish proteins are essential in the diet of densely populated countries, where the total level of protein intake is relatively low. Worldwide, about one billion people rely on fish as their main source of animal protein. Fish dependence is generally higher in coastal areas than in inland areas. About 20% of the world's population accounts for at least a

fifth of the animal protein intake on fish production, and some small island states depend almost exclusively on it. The recommendation for increased consumption - very common a few decades ago - has become more balanced, because a significant proportion of the world's fish catches are transformed into fish meal and used as feed for industrial animal production and, therefore, it is no longer available for human consumption.

Consumption of fruits and vegetables still lower than recommended

Fruits and vegetables play an essential role in ensuring a diversified and nutritious diet. Global trends in vegetable production and supply indicate that vegetable production and consumption vary widely across regions (Table 5).

Reduced fruit and vegetable consumption in many regions of the developing world is, however, a persistent phenomenon, even in countries where such food production can be very high (India, China and so on). A nationally representative surveys in India[1] for example, indicated a constant level of consumption of only 120-140 g per capita per day, with about another 100 g per capita from roots and tubers and about 40 g per inhabitant. This is especially true for rural populations in India, who have relatively low incomes. In China, average quantities of fruits and vegetables consumed have increased, especially until 2000 to over 370 g per inhabitant.

Table 5. Provision of vegetables at regional level, 1979 and 2000
(kg per capita per year)

Region	1979	2000	Regiunea	1979	2000
Global level	66,1	101,9	South America	43,2	47,8
Developed countries	107,4	112,8	Asia	56,6	116,2
Developing countries	51,1	98,8	Europe	110,9	112,5
Africa	45,4	52,1	Oceania	71,8	98,7
North and Central America	88,7	98,3			

Source: FAOSTAT, 2003.

Generally, only a small minority of the world's population achieves higher average consumption at this point. Until 1998, only 6 of the 14 WHO regions had a fruit and vegetable availability equal to or greater than the recommended intake of 400 g per inhabitant per day. The relatively favorable situation in 1998 seems to have evolved from a significantly less favorable position in previous years, a fact evidenced by the large increase in the availability of vegetables registered between 1990 and 1998 for most regions. In contrast, fruit availability generally declined between 1990 and 1998 in most regions of the world.

---

[1] *** India nutrition profile (1998). New Delhi

The intensification of urbanization at a global level has removed an increasing proportion of the world's population from areas with primary food production, which has had a negative impact on the availability of a varied and nutritious diet, with sufficient fruits and vegetables, but also on the access of the poor from cities on such a diet.

However, when the urbanization has acted in the sense of the general increase in the level of income of the urban population it determined implicitly the raise of the access of the respective population to slightly more diverse dietary diets. On the other hand, investments in peri-urban horticulture on a larger scale also offered some opportunities for increasing food consumption and for maintaining healthier diets.

In 2000, the annual average supply of vegetables per capita was 102 kg, with the highest level in Asia (116 kg), and the lowest levels in South America (48 kg) and Africa (52 kg)

The evolution and forecasting of prices

After the sharp rise of the prices for almost all the food commodities during 2007-2012, the world has seen several years of strong supplies, associated with slow growth in demand (Graph 2). This phenomenon has exerted a downward pressure on the international prices of most agricultural commodities, with cereal, beef and sheep meat prices showing short-term rebounds [1]

Graph 2. Evolution of prices for food commodities

Source: OECD–FAO Agricultural Outlook 2019–2028

For nearly all commodities covered in the *OECD–FAO Agricultural Outlook 2019–2028,* real prices are projected (2019) to remain at or below current levels over the coming

---

[1] *** OECD–FAO Agricultural Outlook, 2019–2028

decade, as productivity improvements continue to outpace demand growth. But global food prices rose in October 2019 for the first time in five months, as international quotations for sugar and key cereals increased significantly, according to the Food and Agriculture Organization of the United Nations (FAO).

The FAO Food Price Index averaged 172.7 points in October 2019, some 1.7 percent higher than the previous month and 6.0 percent higher than during October 2018.

World cereal utilization in 2019/20 was forecasted at 2 709 million tons, a record high, while world cereal stocks by the end of the 2020 seasons are seen at 849.5 million tons, down 1.5 percent from their opening levels. FAO anticipates the global cereal stock-to-use ratio declining modestly to 30.4 percent, still judged a comfortable level. Wheat inventories are expected to rise, while those of maize and rice to decline. [1]

Conclusions

The main data regarding the consumption of food from medium or high-developed societies mean large-scale changes in dominant or traditional food consumption patterns, which clearly indicate the outline of a *"nutrition transition" phenomenon.*

This phenomenon refers to some quantitative but also qualitative changes in the eating habits of the majority of the population, in the sense of adopting diets with higher energy density, with a greater role of fats and sugars added in foods, with a higher contribution of saturated fats (especially from animal sources), with reduced intakes of complex carbohydrates and dietary fiber, and reduced intakes of fruits and vegetables. Such dietary changes are accompanied by some modifications of the lifestyles, in the sense of practicing reduced physical activities at work, but also during leisure. This type of nutritional transition did not delay to show some adverse effects on the health of some broad categories of the population, by manifesting nutritional diseases, such as obesity, correlated with an increased incidence of type II diabetes, or with some cardiovascular diseases.

For different reasons, the demand growth for agricultural products has also slowed, especially in some large regions, on the background of the declining growth rates of the population, and also because many countries have reached saturation consumption of food per person, beyond which further rises will be limited.

On the other hand, many poor countries are still facing major food deficits and deficiencies of essential nutrients in the dominant diets of the population. This is because, the mankind still registers a high share of the world's population in poverty which lacks the necessary income for meeting its basic needs. Malnutrition in all its forms remains widespread across the world.

The recent years came with the slowing growth rates of world agricultural production related with the climate changes. In these conditions, all over the world there is high expectation that the agriculture may not be able to grow enough food and commodities of the sort, in order to ensure the needs on long run.

---

[1] *** October rise for global food (2019)

For the next decade, a still growing global population continue to use increasing amounts of agricultural products as food, feed and for industrial purposes. Much of the additional food demand over the coming decade will originate in regions with high population growth, in particular Sub-Saharan Africa, South Asia, and the Middle East and North Africa.

All these will happen in the conditions of a steady productivity growth in agriculture, anyway expected to stay ahead of food demand, and dominant dietary patterns will continue to evolve due to rising incomes and ongoing urbanization.

In future, agriculture will remain a significant contributor to global greenhouse gas emissions, mostly from livestock, as well as rice and synthetic fertilizers, which are expected to grow even if on a declining carbon intensity as productivity increases.

The international trade will remain essential for food security in a growing number of food-importing regions. It also will remain an important source of incomes and livelihoods in exporting regions such as Latin America and the Caribbean region. The Black Sea region will consolidate its position as a leading exporter of wheat and coarse grains, with most exports going to the Middle East and North Africa.

World agricultural markets will face different new uncertainties that add to the traditionally high risks facing agriculture. On the supply side, these include the spread of diseases such as African Swine Fever, growing resistance to antimicrobial substances, regulatory responses to new plant breeding techniques and responses to increasingly likely extreme climatic events. On the demand side, they include evolving diets, reflecting perceptions with respect to health and sustainability issues, and policy responses to alarming trends in obesity. The coronavirus pandemic will also produce a high impact both on the side of supply/demand and on the price evolution for the most food (and not only) production. Uncertainty will influence all the trading agreements between the most important players on world agricultural markets. New opportunities of demand and the escalation of ongoing trade tensions have the potential to reduce and redirect trade,[1] with strong consequences for the international availability of food products on the domestic markets

References

Drewnowski A., Popkin B.M. (1997). The nutrition transition: new trends in the global diet. *Nutrition Reviews,* p. 31-43.

Ion M. (2016) *Pentru prima data în istorie, consumul global de pește pe cap de locuitor se ridică mai sus de 20 de kilograme anual, Radio România*, 08/07/2016, available at http://www.rador.ro/2016/07/08/pentru-prima-data-in-istorie-consumul-global-de-peste-pe-cap-de-locuitor-se-ridica-mai-sus-de-20-de-kilograme-anual/

Guo X et a.l. (2000) *Structural change in the impact of income on food consumption in China 1989-1993. Economic Development and Cultural Change*, p.737-760

Ritchie H., Roser M. (2020) *Diet Compositions*. available at https://ourworldindata.org/diet-compositions

---

[1] OECD–FAO Agricultural Outlook 2019–2028

Lewis B, Assmann G, eds. (1990) *The social and economic contexts of coronary prevention.* London, Current Medical Literature

Pimental D et al. (1997). Water resources: agriculture, the environment and society. *Bioscience*, 47:97-106.

OECD–FAO Agricultural Outlook 2019–2028

Food and Agriculture Organization of the United Nations (2002) World agriculture: towards 2015/2030. Summary report. Rome

FAO (2003) Global and regional food consumption patterns and trends, available at http://www.fao.org/3/ac911e/ac911e05.htm

FAO (2016). The state of world fisheries and aquaculture contributing to food security and nutrition for all, available http://www.fao.org/3/a-i5555e.pdf

Global Burden of Diseases Nutrition and Chronic Diseases Expert Group (NutriCoDE) (2014) *Global, regional, and national consumption levels of dietary fats and oils in 1990 and 2010: a systematic analysis including 266 country-specific nutrition surveys*, available at https://www.bmj.com/content/348/bmj. g2272

Ministry of Human Resource Development, Government of India, Department of Women and Child Development (1998). India nutrition profile

World Health Organization, Nutrition (2003). Available at https://www.who.int/nutrition/ topics/ 3_foodconsumption/en/index6.html

*** October rise for global food (2019), available at priceshttp://www.fao.org/ news/story/en/item/ 1246478/icode/

*** Food Molecules (2020), available at https://www.worldofmolecules.com/foods/

REGIONAL INEQUALITY IN INDIA: A STATE LEVEL ANALYSIS

Aviral PANDEY[1]
Richa GAUTAM[2]

Abstract: This paper tries to understand the nature and extent of inequality across states of India with special reference to Bihar. The study is based on secondary data collected from various sources, including NSSO, NFHS and other government/non-government documents and reports. The study analyzes inequalities under four themes: livelihood, education, health and gender. The analysis finds that, however, some positive changes can be seen in terms of enrolment in case of primary education, but still, productivity of education is the lowest in Bihar. The state government has invested money in attracting students to government schools, but because of a low per capita expenditure on education, access to facilities like computers in schools is the lowest in Bihar. In the case of health expenditure, the people of Bihar have to bear significantly higher per capita out of pocket expenditure. Though, Bihar has achieved higher growth in the last couple of years but the level of female empowerment is still very low in the state. Thus, this study finds that Bihar is still at lowest position in all four themes across states of India and, people of this state are facing grim challenges related to livelihood, quality education and health.

Keywords: Bihar, education, health, India, inequality, livelihood, empowerment index

Introduction

India is a country marked by contrasts and diversity (some of these are geographical in nature, and others are caste, religion and class). India obtained its independence in the year 1947. The size of population was around 361 Million in 1951, around 14 percent of the total world population. At present, India constitutes around 17.7 percent of total world population. The increase in population has not only opened new challenges in the country, but it has also been seen as dividend. The size of the economy has also changed tremendously. In 1951 per capita income was Rs. 7114, while in 2013-2014 (at 2004-05 prices) it was Rs. 39904 and Rs. 100151 in 2017-18 (at 2011-12 prices)[3]. Still,

---

[1] Assistant Professor, A N Sinha Institute of Social Studies, Patna. Email: aviral.ansiss@ gmail.com, Mob: 8987100796.

[2] Assistant Professor, M. R. M. College, Lalit Narayan Mithila University, Darbhanga, Email: gautam.richa01@gmail.com

[3] http://mospi.nic.in/data, http://www.mospi.gov.in/sites/default/files/press_release/Press% 20Note% 20PE%202018-19-31.5.2019-Final.pdf.

challenges lie in terms of rising inequality in India. It is also true that India is no stranger to income inequality, but the inequality is widening at faster rate in the country. Previous year's OXFAM survey had showed that India's richest 1% held 58% of the country's total wealth, which was higher than the global figure of about 50%. Between 2006 and 2015, ordinary workers saw their incomes rise by an average of just 2% a year, while billionaire wealth raised almost six times faster (OXFAM, 2018). Similarly, one can also see emerging inequalities within states of India. There are cities like Mumbai, in the state of Maharashtra, where 233 billionaire people live. On the contrary, in Mumbai, millions of people live in slums. It is known that Bihar has one of the lowest per capita incomes among all states of India. This shows some of the emerging dimensions of inequality within states of India. Such situations not only affect the development of the concerned state, but also the development of the country. For inclusive growth/ development, it is essential that every sector (economics, services etc.) and every state should perform equally well. But, the situation is gloomy in a state like Bihar, where more than 50 percent of workers are dependent on the agriculture sector, which in the last couple of years did not perform well. A World Bank analysis (2018) shows that populated states, including Bihar, are home of poor people in India (See Figure 1).

Figure 1. **State Share in India's Poor and India's Population**
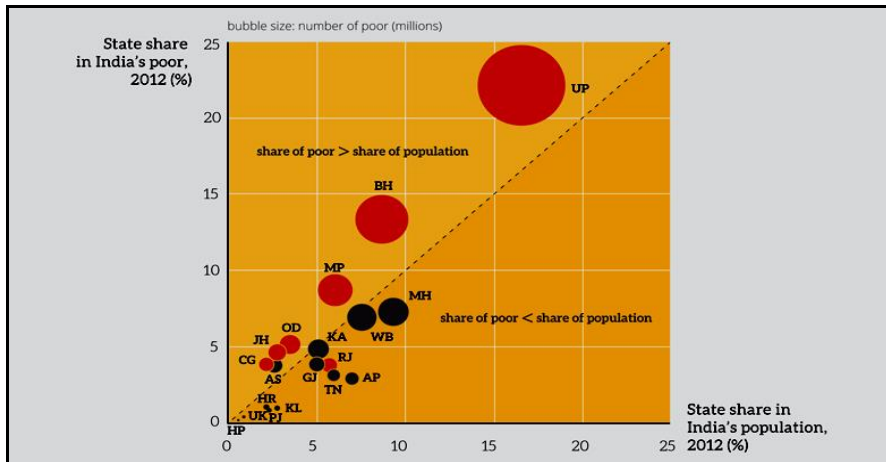
Source World Bank (2018)[1]

One possible reason for such a situation is that most of the households in these states are highly dependent on the agriculture sector. So, even if Bihar has achieved higher growth in overall state's income, a large chunk of population are not getting benefit out of this growth, as they are dependent on a slow growing sector (agriculture). Thus, it can be said that economic growth in Bihar has been less inclusive than in India as a

---

[1] https://www.worldbank.org/en/news/feature/2016/05/26/india-states-briefs.

whole. In the case of Bihar, data also shows that construction activities, and government expenditure on administration (that can be seen in terms of increasing amount of expenditure on salary also), are two major sectors which have increased rapidly in the state. Unfortunately, most of the people who are in non-farm sector in Bihar are working mainly as low paid wage labour/worker in tertiary sector (Anubandhit, Niyojit, and outsourced workers are emerging categories of workers in Bihar). So, growth in the tertiary sector cannot be said to be inclusive in nature in Bihar.

It is also seen that poor states need high government investment on sectors like health and education. But, an analysis of the states' budgets shows that in a state like Bihar, per capita investment by government on education and health is the lowest across states of India (Suhag, Tiwari, 2018). Due to low government expenditure on health and education, people of Bihar are spending higher amounts of their income on private education/tuition and private health care (either in the state or outside the state). Among all states, the share of OOPE (out of Pocket Expenditure) on health against the overall expenditure was highest in Bihar, at 77.6 per cent, against the national average of 60.6 per cent. On the other hand, central and State governments spent Rs. 5740 crore on healthcare in Bihar, where OOPE stood at Rs. 20857 crore in Bihar (NHA 2016-2017). Studies have also tried to explain the factors responsible for inequality in India. It cannot be denied that to some extent situations promoting inequality are already rooted in the history and administrative legacy of India. Just after the independence, the art of governance was highly influenced by the colonial legacy and emphasis was given on the role of government. After the 1980's it can be seen that processes of liberalisation in different areas have been progressing at faster speed in India. Liberalisation has redefined the nature of governance in India as well. There has been a decline in the role of the state and the role of market has gained in importance in India. Thus, changes in nature and extent of inequality over the period are a combined result of internal and external factors and India's excessive income inequality is associated with both market and non-market factors. Inequality is also likely to be present in India as large numbers of the work force are employed in sectors with low productivity, such as agriculture, which provides jobs to around 50 percent of the workforce, but the sector is contributing with only 17 per cent to the GDP of India. On the other hand, after the introduction of LPG regime, labour movements (Labour Union) are weakening day by day and are also affecting the share of labour in total production. It is also true that the privatisation of education and health also forces the poor to expend more on these services. This may affect the wealth creative capacity of poor people and thus it also contributes to a growing wealth inequality. On the opposite, tax benefits to corporate and NPAs (Non Performing Assets) may promote inequality.

On this background, this paper tries to understand the nature and extent of inequality across state of India and also tries to identify the position of Bihar in India in terms of inequality. This study is based on secondary data collected from various sources including NSSO, NFHS and other government/non-government documents and reports. Simple tabular and statistical tools have been used to fulfil the objectives of this study. This work is divided into five parts. Detailed methodology used in any particular section is explained in the concerned section.

Section I: Livelihood Inequality

Rising out migration from some states shows that situation of development is not as good as it is reported via GDP. Thus, growth in GDP data cannot be considered as indicator of inclusive development. Recent migration data released by the Census shows the emerging situation of livelihood crisis faced by households in some states and can be understood through analysing changing dimensions of migration in India. The analysis of Census data shows that the "Hindi Belt" is the main source of migrants in India. According to the 2011 Census, four states (Uttar Pradesh, Bihar, Rajasthan and Madhya Pradesh) accounted for 50 per cent of India's total inter-state migrants. Uttar Pradesh and Bihar are responsible for most of the migrants in India. According to the 2011 Census, 20.9 million people migrated outside the state from these two states. This is 37% of the total number of people who were inter-state migrants according to that enumeration. The major destination states for migrants are Delhi, Maharashtra, Tamil Nadu, Gujarat, Andhra Pradesh and Kerala. Interestingly, Uttar Pradesh figures in both lists (emigration and immigration). Unfortunately, the situation of Bihar is different from any other state in India. The extent of emmigration (work or business is one of the most significant reasons behind this situation) shows how limited/good livelihood options are available to the people in Bihar. Although Bihar has experienced higher growth between 2005 and 2015, it seems that growth in income could not able to generate good livelihood options for its people.

One important section of academia believes that the growth outcome has not been very inclusive in nature in India, thus inequality can be witnessed between rural and urban areas and between different states of India. In this backdrop, an analysis has been done to see existing inequality across states. Inequality has been seen under physical capital, human capital and natural capital (as these are important for generating livelihood options in any particular location/region/state).

Physical Capital at Household Level: Inequality in Access to Assets in states of India

Assets are one of the important factors that are correlated with livelihood options. Correlation analysis between per capita income and value of households' assets score at state level shows that asset scores are positively correlated with income level at state level in India. Including other sources, NFHS also provides data on household asset. Comparison of reports of different rounds of NFHS (National family Health Survey) shows the changing dimensions of inequality in India. Recently Mishra and Joe (2020) have estimated composite household assets score to see inequality in access to assets across households in India. Interestingly, the comparison of two data points (2005-06 and 2015-16) shows that access to assets has increased at overall level in India. The study also points out that the inequality has increased across states in terms of household economic well-being and ownership of assets (few exceptions are there). Still, Bihar is at the lowest level across states in India. In the case of Bihar, very small progress can be seen, as the value of composite household assets score has increased from 0.212 in 2005-06 to 0.227 in 2015-16. The Gini coefficient for the assets score has declined from 0.446 in 2005-06 to 0.401 in 2015-16. Bihar is at the top in terms of level

of inequality in asset score in India. On the other hand, one can find significant decline in inequality in asset score in case of Odisha, Tamil Nadu, Uttar Pradesh, and West Bengal (See Table 1).

Wealth quintiles wise distribution of assets also provides a way to understand interstate inequality in terms of distribution of economic well-being of households. In Jharkhand, Chhattisgarh and Odisha, more than 40 percent of the households were identified in the lowest income quintile in 2005-06. By 2015-16, the situation has improved in Odisha, Jharkhand and Chhattisgarh. On the other hand, more than 45 percent of the households are still in the group of lowest quintile in Jharkhand and Bihar. Thus, it seems that the situation has deteriorated in Bihar, and every second household in Bihar belongs to the lowest wealth quintile group category.

Table 1: Statewise Mean and Gini Coefficient for Household Asset Scores, NFHS 2005–06 and 2015–16

States	Mean Asset Score		Gini Coefficient	
	2005–06	2015–16	2005–06	2015–16
Andhra Pradesh(including Telangana)	0.286	0.357	0.394	0.270
Arunachal Pradesh	0.294	0.331	0.426	0.306
Assam	0.282	0.313	0.413	0.289
Bihar	0.212	0.227	0.446	0.401
Chhattisgarh	0.231	0.312	0.460	0.342
Delhi	0.594	0.533	0.236	0.194
Goa	0.560	0.576	0.263	0.180
Gujarat	0.399	0.410	0.333	0.269
Haryana	0.416	0.516	0.331	0.200
Himachal Pradesh	0.448	0.491	0.277	0.200
Jammu and Kashmir	0.405	0.444	0.322	0.256
Jharkhand	0.212	0.255	0.535	0.396
Karnataka	0.331	0.410	0.396	0.257
Kerala	0.495	0.577	0.241	0.169
Madhya Pradesh	0.247	0.316	0.498	0.376
Maharashtra	0.376	0.408	0.375	0.275
Manipur	0.360	0.403	0.307	0.256
Meghalaya	0.292	0.326	0.366	0.270
Mizoram	0.433	0.458	0.278	0.252
Nagaland	0.311	0.355	0.332	0.274
Odisha	0.223	0.274	0.486	0.360
Punjab	0.505	0.580	0.272	0.164
Rajasthan	0.279	0.355	0.481	0.340
Sikkim	0.366	0.396	0.293	0.163
Tamil Nadu	0.317	0.435	0.404	0.237
Tripura	0.288	0.326	0.336	0.263
Uttar Pradesh	0.264	0.319	0.460	0.363
Uttarakhand	0.410	0.434	0.351	0.254
West Bengal	0.261	0.311	0.455	0.312
All India	0.307	0.365	0.431	0.323

Source: Mishra and Joe (2020)

Table 2: Statewise Distribution of Households by Wealth Quintile,
As per NFHS 2005–06 and 2015–16

States	Lowest		Second		Middle		Fourth		Highest	
	2006	2016	2006	2016	2006	2016	2006	2016	2006	2016
Andhra Pradesh (including Telangana)	12	7	18	17	29	29	25	28	16	19
Arunachal Pradesh	21	19	24	24	20	26	17	22	18	9
Assam	20	25	30	38	22	18	15	13	13	6
Bihar	31	53	30	22	18	13	13	9	9	3
Chhattisgarh	43	35	26	24	13	16	8	12	9	13
Delhi	0	0	3	2	10	15	20	22	67	61
Goa	3	0	6	5	14	12	22	28	55	55
Gujarat	7	9	15	16	19	20	27	25	32	30
Haryana	4	2	13	8	25	18	28	26	30	46
Himachal Pradesh	1	2	9	10	23	23	31	33	35	32
Jammu and Kashmir	3	7	13	19	28	24	29	24	28	26
Jharkhand	52	48	15	20	10	13	11	10	12	9
Karnataka	11	7	22	20	23	26	22	26	21	21
Kerala	1	0	5	3	13	14	37	35	45	48
Madhya Pradesh	38	33	24	22	13	15	12	14	13	16
Maharashtra	12	10	16	16	18	22	23	25	32	26
Manipur	3	10	17	31	34	30	31	19	15	9
Meghalaya	12	12	22	35	23	31	26	16	16	7
Mizoram	2	6	6	11	19	21	36	29	37	33
Nagaland	7	12	22	31	30	27	26	20	15	10
Odisha	42	38	20	26	17	18	12	11	9	7
Punjab	1	1	7	4	17	12	30	22	45	61
Rajasthan	25	18	17	24	21	21	17	18	20	19
Sikkim	2	1	10	7	22	41	31	40	35	12
Tamil Nadu	12	5	16	15	29	27	23	31	19	22
Tripura	11	13	25	42	40	23	16	15	8	6
Uttar Pradesh	28	32	25	22	18	16	16	14	13	16
Uttarakhand	7	5	16	18	21	25	23	23	33	29
West Bengal	25	24	24	29	19	20	18	17	15	9
All India	20	20	20	20	20	20	20	20	20	20

Source: Mishra and Joe (2020)

Table 2 also points out that around 40 percent households with low wealth score in India are found in Bihar and Jharkhand. In terms of wealth score, 40 percent of the households are poor (at least relatively poor) in Bihar. On the other hand, between 2004-05 and 2014-15, Bihar emerged as one of the fastest growing states of India,

clocking over 10 per cent annual growth for the past decade. Thus, it can be concluded that economic growth has not affected the asset based economic well-being situation of households in Bihar (as around 50 percent of households are still in the lowest wealth quintile group). Here, we have also tried to understand how inequality in terms of human capital and natural capital can explain the existing nature on livelihood inequality across states of India.

Human Capital

India is the second populated country of world. The human capital index prepared by the World Bank points out towards some important facts. This index is supposed to present the value of productivity of the next generation workers. It covers three major dimensions, including survival, expected years of quality adjusted school and health environment. Recent report on this index (2018) shows that only 8% of the population is expected to be 75% as productive as they could be. The value of this index for India has been estimated at 0.44. This shows that a child born in India today will be only 44 percent as productive as she/he could be (if he/she enjoyed complete education and full health facilities/situation). Unfortunately, data related to all variables (those are used to measure human capital index) at state level is not available. So we have used proxies to understand the situation of human capital in the states of India using the ASER report[1] and NFHS reports. Stunted percentage is one of the important variables of human capital index. NFHS 4 (2015-16) shows some emerging trend of child healthy growth in India. In states like Bihar, Uttar Pradesh, Jharkhand, Meghalaya, Madhya Pradesh, Dadar Nagar Haveli, more than 40 percentage of children below five years are stunted. In terms of percentage of children stunted, Bihar is at the lowest rank (see Table 3).

Table 3: Statewise Child Stunted Rate in India

Name of State	Stunted	Name of State	Stunted
Bihar	48.3	Sikkim	29.6
Uttar Pradesh	46.3	Arunachal Pradesh	29.4
Jharkhand	45.3	Manipur	28.9
Meghalaya	43.8	Nagaland	28.6
Madhya Pradesh	42	Telangana	28.1
Dadar Nagar Haveli	41.7	Mizoram	28
Rajasthan	39.1	Chandigarh	27.6
Gujarat	38.5	Jammu & Kashmir	27.4
Chhattisgarh	37.6	Tamil Nadu	27.1
Assam	36.4	Lakshadweep	27
Karnataka	36.2	Himachal Pradesh	26.3
Maharashtra	34.4	Punjab	25.7
Odisha	34.1	Tripura	24.3
Haryana	34	Puducherry	23.7

[1] The ASER survey is a nationwide household survey, covering 596 districts in rural India. A total of 354,944 households and 546,527 children between ages three and 16 were surveyed to evaluate learning outcomes.

Name of State	Stunted	Name of State	Stunted
Uttarakhand	33.5	**Daman & Diu**	23.4
West Bengal	32.5	**Andaman and Nicobar**	23.3
NCT Delhi	32.3	**Goa**	20.1
Andhra Pradesh	31.4	**Kerala**	19.7

Source: NFHS4

There is no such data related to quality of education at overall level for states of India. But ASER provides data on the quality of students of schools in India. It can be used to understand the situation of quality of education in school education in India and its probable effect on productivity. Table 4 and Table 5 show reading and analytical capacity of students (of Fifth Class) for enrolled students (of year 2018). If we consider the learning levels of children as an indicator of productivity of the education system, then the levels of productivity in 2008 and 2018 show that productivity of education has declined by nearly 9 percentage points, or about 17 percent (in terms of reading capacity) and nearly 12 percentage points, or about 34 percent (in terms of analytical capacity). Table 4 and Table 5 show significant disparities in terms of learning outcomes, progress made with reference to RTE Act 2009 and facilities at schools across states of India.

Table 4 and Table 5 show how each state has performed over the years in terms of productivity of education system. Overall, the performances of Bihar, Jharkhand, and Rajasthan have not been found very satisfactory during 2008 to 2018. Thus, parameters of malnutrition and education show that productivity of children in Bihar, Jharkhand and Rajasthan is lower than other states of India. These states are already at lower rank in terms of per capita income. Further, low productivity of children in these states in comparison to other states will increase the gap between the rich and poor states of India. The situation is more disastrous for Bihar, as more than 37 per cent of Bihar's current population is below the age of 14 and productivity level of state's education and health system (in terms of IMR and situation of malnutrition) system are in bad situation in India.

Table 4: Percentage of Children in Government Schools
in Std. V who can read Std. II level text, 2008-2018

	2008	2010	2012	2014	2016	2018
India	53.1	50.7	41.7	42.2	41.7	44.2
Kerala	73.3	74	59.9	61.3	63.3	73.1
Maharashtra	74.3	71	55.3	51.7	63.1	66
Punjab	61.3	68.7	69.5	60.9	64	68.7
Uttarakhand	64.6	63.7	52.2	52	55.9	58
Haryana	61.1	60.7	43.5	53.9	54.6	58.1
Chhattisgarh	74.1	61	44	47.1	51	57.1
Assam	40.9	42.6	33.3	30.6	32.2	33.5
Madhya Pradesh	86.8	55.2	27.5	27.5	31.4	34.4
Karnataka	42.9	42.9	47.2	45.7	41.9	47.6
Himachal Pradesh	73.6	75.7	71.2	71.5	65.3	74.5
Odisha	59.6	45.5	46.1	49.1	48.8	56.2

	2008	2010	2012	2014	2016	2018
Uttar Pradesh	33.4	36	25.6	26.8	24.3	36.2
Jharkhand	51.9	48.4	32.5	29.1	31.4	29.4
West Bengal	45.2	54.2	48.7	51.8	50.2	50.5
Gujarat	43.8	43.5	46.3	44.6	52.3	52
Rajasthan	45.1	44.2	33.3	34.4	42.5	39.1
Tamil Nadu	26.7	30.9	30.2	49.9	49.4	46.3
Bihar	62.8	57.9	43.1	44.6	38	35.1

Source: ASER (2018)

Table 5: Percentage of Children in Government Schools
in Std. V who can do Division, 2008-2018

India	**34.4**	**33.9**	**20.3**	**20.7**	**21.1**	**22.7**
Himachal Pradesh	57.4	61.8	40.7	37.9	47.4	51.5
Punjab	39.7	70.8	48.6	37.1	42.4	50.1
Uttar Pradesh	15.8	18.7	9.1	12.1	10.4	17
Kerala	38.3	43.1	38	25.6	27.1	33.5
Chhattisgarh	59.5	37.8	13.1	14.1	18.6	26.1
Maharashtra	46.9	39.9	20.2	16.6	19.7	31.7
Madhya Pradesh	77.5	38	8.9	10	15.3	16.5
Gujarat	24.1	19.6	12.4	13.9	14.5	18.4
Uttarakhand	38.4	48.7	27.3	21.4	25.5	26.7
Assam	15.5	22.6	8.9	9	9.1	14.4
West Bengal	29.4	38.1	28.7	31.3	28.6	29.2
Haryana	45.7	50.5	25.4	30.8	30.1	34.4
Karnataka	14.9	18.7	17.4	16.7	17.2	19.6
Tamil Nadu	9	14.1	9.6	25.6	21.4	27.1
Bihar	50.9	51	30	31.4	28.9	24.1
Jharkhand	30.5	40.1	20.1	17.6	20	15.6
Rajasthan	25.9	25.2	9.9	12	15.6	14.1
Odisha	36	31.3	17.2	19.9	23.8	23.8

Source: ASER (2018)

Natural Capital

Normally, inequality seen in terms of income and consumption ignores the aspect of natural capital. Thus, it underestimates the existing level of inequality. This is true if some states are using natural capital faster than others. Like financial savings, the possibility of future growth also depends on the level of natural capital that one state or region keeps for use in future. If a region uses natural capital at a faster rate it will lead to another crisis that the region may have to face in near future. So, the importance of natural capital must not be ignored.

Table 6: Level of change in Natural Capital during year 2005 and 2015 in India

Level of change in natural capital during 2005-15	States
Increase greater than 5%	Madhya Pradesh, Maharashtra, Manipur and Rajasthan
Increase between 0-5%	Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Nagaland, Odisha, Sikkim, Uttar Pradesh and West Bengal
Negative change	Assam, Bihar, Gujarat, Jharkhand, Karnataka, Kerala, Mizoram, Punjab, Tamil Nadu, Tripura and Uttarakhand

Source: EnviStats-India 2018

Natural (or ecological) capital is an outcome of the natural system (ecological system). The natural system provides goods that depletes due to production of goods and services, and we ignore to depreciate the value of such depletion during estimation of GDP. It means that if we reduce the amount of the natural capital at higher rate it will affect the future ability to produce goods and services. A report on environment accounts released by the MoSPI (The Ministry of Statistics and Programme Implementation) shows that during 2005-15 for almost all states the average growth rate of gross state domestic product (GSDP) was around 7-8 per cent. During same years, 11 states registered a decline in their natural capital, 13 states showed a marginal growth in the range 0-5 per cent, and only four states saw their natural capital increase by more than 5 per cent (See Table 6). It seems that the present model of economic growth may not be sustainable for some states in India.

The report also reveals that states like Andhra Pradesh, Gujarat, Jharkhand, Kerala, Maharashtra and Odisha show an increase in parameters such as transition of fallow land to farmland, increase in forest cover along with growing carbon stock and new sources of minerals. The report shows 24% decline in the area under snow and glacier in some states and also shows the impact of climate change on wetlands/water bodies in Himachal Pradesh, Sikkim and Jammu Kashmir. Unsustainable extraction of groundwater resources is resulting into decline in the water levels in Tamil Nadu, Chhattisgarh, Goa, Odisha and Rajasthan. Down to Earth's State of India's Environment 2018 had also talked about increasing dependency and unsustainable use of groundwater resources. It had revealed that in 2013, the country used 62 per cent of the net available annual groundwater, which is a 58 per cent increase from 2004.

In the last 6 years, the rate of growth of forest stock has reduced by more than 10% in almost all states. From 2006-07 to 2010-11, all states, except Goa and Sikkim, have shown such a decline. However, from 2010-11 to 2015-16, even though there was a marginal change in forest coverage in Assam and Uttarakhand, growing stock (of forest) has reduced by more than 10 per cent. But in the case of Jharkhand, Madhya Pradesh, Maharashtra and Rajasthan, despite a marginal change in forest cover, growing stock has significantly increased by more than 10 per cent. Conversion of agricultural land to meet needs of urban population also affects its productive capacity. The report says that high rate of urban growth is likely to affect a productive capacity (of

agriculture) in states like Punjab, Haryana, Karnataka, Telangana and West Bengal. Livelihood options in agriculture may be affected in Punjab, Haryana, Karnataka, Telangana and West Bengal in upcoming years. Because natural capital is one of the important sources of livelihood in most of the states India, an analysis of access to natural capital across state level is important. We have analysed the situation of states as per two most important natural capitals (forest and wetland) and these are also very important for livelihood diversification in states of India, mostly in states where those are highly dependent on primary sector. Table 7 and Table 8 show distribution of states as per forest coverage in India. We can see that with reference to population the forest coverage is low in almost 20 states of India. States like Jharkhand, Uttar Pradesh and Bihar are also included in the list of these 20 states.

Table 7: Forest Coverage in India (A)

Per thousand area under tree (Sq.KM/Person)	Name of States
less than 1	Jharkhand, Kerala, Karnataka, Dadra & Nagar Haveli ,Telangana, Andhra Pradesh, Maharashtra, Lakshadweep, Tamil Nadu, Gujarat, Rajasthan, West Bengal, Daman & Diu, Uttar Pradesh, Bihar, Punjab, Haryana, Puducherry, Chandigarh, Delhi.
1 to less than 10	Nagaland, Manipur, Meghalaya, Sikkim, Uttarakhand, Himachal Pradesh, Chhattisgarh, Tripura, Goa, Odisha, Madhya Pradesh
Greater than 10	Arunachal Pradesh, Andman & Nicobar is.. Mizoram

Source: EnviStats-India 2018

Table 8: Forest Coverage in India (B)

Area under Forest Coverage (Area in percentage)	Name of States
Greater than 75	Lakshadweep, Mizoram, Andman & Nicobar is., Arunachal Pradesh, Meghalaya, Manipur, Nagaland
Less than 75 and greater than 50 percent	Tripura, Goa, Kerala
50 to greater than 25	Sikkim, Uttarakhand, Dadra & Nagar Haveli, Chhattisgarh, Assam, Odisha, Jharkhand, Himachal Pradesh, Madhya Pradesh
0-25	Tamil Nadu, Karnataka, Chandigarh, West Bengal, Daman & Diu, Telangana. Andhra Pradesh, Maharashtra, Delhi, Puducherry, Bihar, Gujarat, Uttar Pradesh, Rajasthan, Punjab, Haryana

Source: EnviStats-India 2018

In terms of area under forest coverage, states like Bihar and Uttar Pradesh are poor performer states in India. Similarly, in case of availability of wetland (see Table 9 and Table 10) Bihar is the poor performer. Significantly, one third of the countrys population is living in Bihar and Uttar Pradesh. And more than 50 percent of population of these two states are dependent on primary sector in India. Wetland and forest coverage is important for the reduction in the impacts of floods. They also absorb pollutants and improve water quality. Unfortunately, the situation of wetland and forest coverage is very poor in Bihar and Uttar Pradesh. Such situations may

further lead to decrease in livelihood potential in states like Bihar and Uttar Pradesh and, thus inequality may further lead to increase across states of India in near future.

Table 9: Wetlands in India (A)

Per lakh Population number of Wetland	States
Higher than 100	Andaman & Nicobar Is.
100 to 10	Arunachal Pradesh, Tripura, Mizoram, Chhattisgarh, West Bengal, Sikkim, Madhya Pradesh
less than 10 and greater than 5	Nagaland, Odisha, Meghalaya, Maharashtra, Manipur, Gujarat, Rajasthan, Assam, Jharkhand
Less than 5	Goa, Karnataka, Telangana, Andhra Pradesh, Uttarakhand, Tamil Nadu, Himachal Pradesh, Dadra & Nagar Haveli, Uttar Pradesh, Kerala, Puducherry, Punjab, Chandigarh, Haryana, Bihar, Delhi

Source: EnviStats-India 2018

Table 10: Wetlands in India (B)

Area under Wetland (in percentage)	Name of States
Greater than 10	Puducherry, Gujarat, West Bengal, Andaman & Nicobar is.
10 to 3	Chandigarh, Haryana, Punjab, Uttar Pradesh
less than 3 to 1	Assam, Uttarakhand, Tamil Nadu, Maharashtra, Kerala, Andhra Pradesh, Madhya Pradesh, Karnataka, Rajasthan, Dadra & Nagar Haveli, Odisha, Chhattisgarh, Meghalaya, Nagaland, Arunachal Pradesh, Telangana
Less than 1	Sikkim, Jharkhand, Goa, Manipur, Tripura, Bihar, Mizoram, Himachal Pradesh, Delhi

Source: EnviStats-India 2018

Section II: Inequality in Education

It can be seen that situation of enrolment in educational institutions in state like Bihar has improved after implementation of RTE (Table 11). Bihar and Jharkhand are performing well in case of primary and upper primary education. But as the level of education increases, we see a fall in the ranks of these states (as per gross enrolment ratio). In terms of access to facilities like computers, the situation has deteriorated in Bihar and Chhattisgarh in the last couple of years. As per the ASER report 2018, Bihar stands at lowest rank in terms of schools with computers. Figure 2 also shows the level of inequality across states in terms of availability of computers in schools. The situation of higher education is also gloomy in Bihar. Table 12 shows that Bihar is at lowest rank (excluding union territory) in terms of GER (Gross Enrolment Ratio) in higher educational institutions.

Table 11: State wise Gross Enrolment Rates in India (2015-16)

Sl. No.	Level of Education State/UT	Primary			Upper-Primary			Secondary			Senior Secondary			Higher Education		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Male	Female	Total	Male	Female	Total
1	A&N Islands	91.13	86.76	88.93	86.35	81.97	84.14	89.07	84.28	86.69	72.92	76.40	74.62	22.3	24.7	23.5
2	Andhra Pradesh	84.88	84.05	84.48	81.12	81.56	81.33	74.63	76.48	75.51	58.28	62.27	60.16	34.7	26.9	30.8
3	Arunachal Pradesh	127.61	125.88	126.76	127.14	133.20	130.13	91.66	87.58	89.63	62.02	61.60	61.81	28.8	28.5	28.7
4	Assam	104.70	107.59	106.11	87.65	98.75	93.05	72.48	83.04	77.59	38.22	39.47	38.81	16.2	14.7	15.4
5	Bihar	104.35	111.30	107.67	98.21	119.39	107.89	72.42	85.43	78.37	34.76	36.66	35.62	15.8	12.6	14.3
6	Chandigarh	77.42	86.57	81.44	90.42	102.40	95.53	85.23	89.84	87.19	80.86	86.75	83.28	48.4	70.4	57.6
7	Chhattisgarh	100.17	99.87	100.02	101.62	103.08	102.33	89.44	94.48	91.93	53.89	54.11	54.00	15.7	14.6	15.1
8	D&N Haveli	84.69	80.21	82.53	93.71	87.97	90.96	91.56	85.17	88.57	45.29	52.60	48.49	7.8	11.3	9.1
9	Daman & Diu	79.68	84.95	82.03	74.86	84.64	79.15	67.05	81.44	72.97	16.32	32.27	21.54	4.6	9.2	5.7
10	Delhi	108.04	113.93	110.71	118.86	140.55	128.12	103.23	111.27	106.81	73.25	83.60	77.90	43.0	48.2	45.4
11	Goa	100.89	104.45	102.57	96.83	100.93	98.74	103.03	105.44	104.16	70.79	81.59	75.84	25.0	30.9	27.6
12	Gujarat	95.64	99.11	97.24	94.70	96.99	95.73	80.26	66.82	74.13	45.17	41.42	43.43	22.9	18.3	20.7
13	Haryana	89.96	93.21	91.41	87.39	99.22	92.39	84.20	84.23	84.22	59.68	59.48	59.59	25.9	26.4	26.1
14	Himachal Pradesh	97.97	99.73	98.80	103.37	105.47	104.36	108.44	105.53	107.08	94.58	96.60	95.53	29.6	35.5	32.5
15	Jammu and Kashmir	84.86	87.24	85.98	68.77	71.85	70.20	67.55	65.88	66.81	61.01	55.98	58.60	23.5	26.2	24.8
16	Jharkhand	108.56	109.92	109.22	97.75	108.19	102.73	70.70	76.93	73.65	47.75	48.98	48.32	16.2	14.8	15.5
17	Karnataka	102.93	103.04	102.98	92.43	94.39	93.37	82.35	84.19	83.22	37.12	42.87	39.86	26.3	25.9	26.1
18	Kerala	95.45	95.44	95.44	94.55	96.28	95.39	102.31	102.58	102.44	72.88	82.44	77.56	26.6	35.0	30.8

Sl. No.	Level of Education State/UT	Primary			Upper-Primary			Secondary			Senior Secondary			Higher Education		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Male	Female	Total	Male	Female	Total
19	Lakshadweep	77.90	69.90	73.80	92.53	75.67	83.26	105.39	102.06	103.66	93.23	102.35	98.16	4.1	10.2	7.1
20	Madhya Pradesh	95.35	93.52	94.47	90.49	98.13	94.02	81.54	79.30	80.49	47.04	43.24	45.25	21.1	17.9	19.6
21	Maharashtra	97.86	97.60	97.74	97.44	101.38	99.24	91.97	87.62	89.95	68.74	66.74	67.81	31.9	27.6	29.9
22	Manipur	128.91	132.90	130.85	127.00	132.94	129.89	93.61	92.52	93.07	71.10	64.81	67.95	35.3	33.1	34.2
23	Meghalaya	138.75	143.12	140.90	126.00	146.20	135.89	80.73	93.94	87.27	39.77	47.03	43.35	20.4	21.1	20.8
24	Mizoram	124.91	121.00	122.99	135.90	133.60	134.78	107.26	110.85	109.02	53.57	57.86	55.68	25.2	23.0	24.1
25	Nagaland	98.14	100.96	99.50	98.55	106.40	102.28	68.90	74.57	71.62	36.42	36.44	36.43	14.2	15.6	14.9
26	Odisha#	104.91	102.50	103.73	94.86	93.63	94.26	79.40	79.83	79.61	-	-	-	21.5	17.8	19.6
27	Puducherry	80.20	90.23	84.79	82.41	92.57	87.04	83.59	95.38	88.95	64.74	86.95	74.80	44.2	42.1	43.2
28	Punjab	99.87	103.99	101.70	95.01	102.92	98.38	87.12	86.97	87.06	69.03	71.69	70.19	25.8	28.5	27.0
29	Rajasthan	101.27	99.48	100.43	91.46	91.21	91.34	81.15	70.12	76.06	66.09	51.59	59.31	21.8	18.5	20.2
30	Sikkim	107.27	98.32	102.87	143.72	157.85	150.61	113.52	126.14	119.78	60.72	75.88	68.23	36.7	38.5	37.6
31	Tamil Nadu	103.39	104.43	103.89	92.55	95.65	94.03	91.86	96.18	93.92	74.14	90.60	82.03	46.3	42.4	44.3
32	Telangana	103.13	102.90	103.02	88.61	90.27	89.41	80.73	84.44	82.53	57.99	64.88	61.32	39.3	33.4	36.3
33	Tripura	107.58	108.36	107.96	125.75	130.33	127.97	116.17	120.91	118.49	45.24	41.53	43.46	19.9	14.0	16.9
34	Uttar Pradesh	88.63	96.16	92.15	68.24	83.49	75.08	67.65	67.86	67.75	62.21	59.26	60.78	24.2	24.9	24.5
35	Uttarakhand	98.87	99.76	99.29	85.84	88.07	86.89	85.71	85.73	85.72	73.36	78.54	75.83	33.6	32.9	33.3
36	West Bengal	103.13	104.26	103.68	97.90	112.64	105.00	74.92	92.65	83.56	48.98	54.36	51.54	19.1	16.2	17.7
	All India	97.87	100.69	99.21	88.72	97.57	92.81	79.16	80.97	80.01	55.95	56.41	56.16	25.4	23.5	24.5

Source: Educational statistics at a Glance, MHRD 2018

Table 12: Rank wise distribution of State as per Gross Enrolment Ratio

Primary	Upper Primary	Secondary	Upper Secondary	Higher Education
Meghalaya	Sikkim	Sikkim	Lakshadweep	Chandigarh
Manipur	Meghalaya	Tripura	Himachal Pradesh	Delhi
Arunachal Pradesh	Mizoram	Mizoram	Chandigarh	Tamil Nadu
Mizoram	Arunachal Pradesh	Himachal Pradesh	Tamil Nadu	Puducherry
Delhi	Manipur	Delhi	Delhi	Sikkim
Jharkhand	Delhi	Goa	Kerala	Telangana
Tripura	Tripura	Lakshadweep	Goa	Manipur
Bihar	Bihar	Kerala	Uttarakhand	Uttarakhand
Assam	West Bengal	Tamil Nadu	Puducherry	Himachal Pradesh
Tamil Nadu	Himachal Pradesh	Manipur	A & N Islands	Andhra Pradesh
Odisha	Jharkhand	Chhattisgarh	Punjab	Kerala
West Bengal	Chhattisgarh	Maharashtra	Sikkim	Maharashtra
Telangana	Nagaland	Arunachal Pradesh	Manipur	Arunachal Pradesh
Karnataka	Maharashtra	Puducherry	Maharashtra	Goa
Sikkim	Goa	Dadra & Nagar Haveli	Arunachal Pradesh	Punjab
Goa	Punjab	Meghalaya	Telangana	Haryana
Punjab	Gujarat	Chandigarh	Uttar Pradesh	Karnataka
Rajasthan	Chandigarh	Punjab	Andhra Pradesh	Jammu and Kashmir
Chhattisgarh	Kerala	A & N Islands	Haryana	Uttar Pradesh
Nagaland	Odisha	Uttarakhand	Rajasthan	Mizoram
Uttarakhand	Tamil Nadu	Haryana	Jammu & Kashmir	Andaman & Nicobar Islands
Himachal Pradesh	Madhya Pradesh	West Bengal	Mizoram	Meghalaya
Maharashtra	Karnataka	Karnataka	Chhattisgarh	Gujarat
Gujarat	Assam	Telangana	West Bengal	Rajasthan
Kerala	Haryana	Madhya Pradesh	Dadra & Nagar Haveli	Odisha
Madhya Pradesh	Rajasthan	Odisha@	Jharkhand	Madhya Pradesh
Uttar Pradesh	Dadra & Nagar Haveli	Bihar	Madhya Pradesh	West Bengal
Haryana	Telangana	Assam	Tripura	Tripura
A & N Islands	Puducherry	Rajasthan	Gujarat	Jharkhand
Jammu & Kashmir	Uttarakhand	Andhra Pradesh	Meghalaya	Assam
Puducherry	A & N Islands	Gujarat	Karnataka	Chhatisgarh
Andhra Pradesh	Lakshadweep	Jharkhand	Assam	Nagaland
Dadra & Nagar Haveli	Andhra Pradesh	Daman & Diu	Nagaland	Bihar
Daman & Diu	Daman & Diu	Nagaland	Bihar	Dadra & Nagar Haveli
Chandigarh	Uttar Pradesh	Uttar Pradesh	Daman & Diu	Lakshadweep
Lakshadweep	Jammu & Kashmir	Jammu & Kashmir		Daman & Diu

Notes: Name of state has been given on the basis of ranks as per Gross Enrolment ratio. Names of states have been mentioned in descending order.

Source: Author's Calculation based on data given in Educational statistics at a Glance, MHRD 2018.

Table 13: Inequality among Male in School Attendance Rate (6–17) Years

State	SC/gen	State	ST/gen	State	OBC/gen
Mizoram	-	Mizoram	-	Mizoram	-
Arunachal Pradesh	1.06	Punjab	-	Meghalaya	1.14*
Goa	1.05*	Arunachal Pradesh	1.12	Assam	1.07
Maharashtra	1.04	Assam	1.11	Nagaland	1.05*
Assam	1.04	Nagaland	1.09	Goa	1.03
West Bengal	1.01	Meghalaya	1.01	Jammu & Kashmir	1.03
Telangana	1.01	Sikkim	0.99	Maharashtra	1.03
Sikkim	1.01	Manipur	0.99	Telangana	1.02
Tripura	1.00	Jammu & Kashmir	0.99	Himachal	1.01
Jammu & Kashmir	1.00	Himachal	0.99	Sikkim	1.00
Chhattisgarh	0.97	Haryana	0.98*	Tripura	1.00
Manipur	0.96	Goa	0.97	Manipur	0.99
Uttarakhand	0.96	Telangana	0.96	West Bengal	0.99
Himachal	0.96	Karnataka	0.95	Kerala	0.99
Andhra Pradesh	0.96	West Bengal	0.95	Bihar	0.99
Meghalaya	0.96	Tripura	0.95	Karnataka	0.98
Karnataka	0.95	Bihar	0.94	Andhra Pradesh	0.98
Haryana	0.95	Uttarakhand	0.93	Tamil Nadu	0.98
Kerala	0.95	Chhattisgarh	0.91	Chhattisgarh	0.98
Nagaland	0.94	Maharashtra	0.91	Odisha	0.98
Uttar Pradesh	0.94	Jharkhand	0.91	Jharkhand	0.97
Tamil Nadu	0.94	Uttar Pradesh	0.91	Haryana	0.96
Odisha	0.93	Kerala	0.90	Uttar Pradesh	0.96
Madhya Pradesh	0.92	Tamil Nadu	0.90	Madhya Pradesh	0.96
Bihar	0.92	Rajasthan	0.88	Rajasthan	0.95
Punjab	0.91	Andhra Pradesh	0.88	Punjab	0.95
Rajasthan	0.91	Odisha	0.86	Arunachal Pradesh	0.94
Gujarat	0.91	Gujarat	0.85	Uttarakhand	0.90
Jharkhand	0.90	Madhya Pradesh	0.82	Gujarat	0.90

* Based on 25-49 unweighted cases.

Note: Here, inequality is defined as the ratio of indicators for relevant groups and values are ranked.

Source: Author's Calculation based on NFHS-4, State Reports (2017)

Table 14: Inequality among Female in School Attendance Rate (6–17) Years

State	SC/gen	State	ST/gen	State	OBC/gen
Arunachal Pradesh	1.10	Nagaland	1.12	Nagaland	1.12
Sikkim	1.04	Arunachal Pradesh	1.11	Arunachal Pradesh	1.06
Maharashtra	1.03	Assam	1.06	Maharashtra	1.04
Manipur	1.00	Sikkim	1.01	West Bengal	1.03
Assam	1.00	Manipur	1.01	Himachal	1.02
Tripura	0.99	Meghalaya	0.98	Tripura	1.01
West Bengal	0.99	Tripura	0.97	Sikkim	1.01
Telangana	0.98	Himachal	0.97	Bihar	1.01
Goa	0.98*	Uttarakhand	0.96	Telangana	1.00
Kerala	0.97	West Bengal	0.96	Goa	1.00

State	SC/gen	State	ST/gen	State	OBC/gen
Chhattisgarh	0.96	Goa	0.95	Kerala	0.99
Nagaland	0.96	Karnataka	0.94	Assam	0.99
Jammu & Kashmir	0.95	Bihar	0.93	Jammu & Kashmir	0.99
Tamil Nadu	0.95	Telangana	0.91	Karnataka	0.98
Uttarakhand	0.95	Tamil Nadu	0.90	Tamil Nadu	0.98
Haryana	0.94	Maharashtra	0.90	Manipur	0.97
Karnataka	0.94	Jammu & Kashmir	0.89	Jharkhand	0.97
Himachal	0.94	Uttar Pradesh	0.89	Chhattisgarh	0.95
Odisha	0.93	Jharkhand	0.88	Uttar Pradesh	0.95
Andhra Pradesh	0.93	Andhra Pradesh	0.86	Odisha	0.94
Uttar Pradesh	0.92	Chhattisgarh	0.85	Punjab	0.94
Bihar	0.92	Kerala	0.85	Madhya Pradesh	0.93
Meghalaya	0.91	Gujarat	0.84	Haryana	0.93
Madhya Pradesh	0.90	Odisha	0.84	Andhra Pradesh	0.93
Punjab	0.89	Rajasthan	0.83	Rajasthan	0.91
Rajasthan	0.89	Madhya Pradesh	0.79	Uttarakhand	0.87
Jharkhand	0.88	Haryana	0.76*	Gujarat	0.86
Gujarat	0.87	Mizoram	-	Meghalaya	-
Mizoram	-	Punjab	-	Mizoram	-

* Based on 25-49 unweighted cases.

Note: Here, Inequality is defined as the ratio of indicators for relevant groups and values are ranked.

Source: Author's Calculation based on NFHS-4, State Reports (2017).

If we assume that productivity of worker/population increases with the increase in level of education, then cross state data of GER shows that productivity of worker/population is lowest in Bihar in comparison to other states of India. It is observed that sates with low income have low and uneven educational participation and attainments. This is essentially because of the income of people (which is also linked with the occupation structure) and the level of existing literacy play contrasting roles for different states.

The data used in this paper also tries to identify how different states are succeeding in their learning (under the given element of inequality). In this work we have also focused on inequalities in access, attainment and outcomes (like attendance rates, dropout rates, enrolment rates and literacy rates) across caste categories. By using secondary data provided by national sample survey (NFHS), we have examined whether social inequality are entrenched in education inequality. The inequality for groups like SCs, STs, OBCs population and interpreted as relative to general category. NFHS data shows that educational attainment at the household level has increased substantially between the years 2005-06 and 2015-16. Among females, the median number of years of schooling increased from 1.9 years in NHFS-3 (2005-06) to 4.4 years in NHFS-4 (2015-16). The median number of years of schooling completed by males increased from 4.9 years in NHFS-3 to 6.9 years in NHFS-4. Over the same period, the

percentage of females and males with no schooling decreased from 42 percent of females and 22 percent of males to 31 percent of females and 15 percent of males. Table 13 and Table 14 show inequality between general and SC, General and ST and General and OBC in case of attendance rate among 6-17 years of age group of students. We find inequality between SC and General and ST and general categories of students. Bihar is among the list of high inequality states of India, especially in case of male SC and male General categories of students. Significantly, in case of female students we find low inequality between OBC and General category in comparison to male students in Bihar. In case of female we find equality between OBC and General category of students in Bihar. Table 15 shows situation of inequality at overall (male and female) level. Here, we find that situation of Gujarat is worst in India in case of inequality between SC and General Students (measured in terms of attendance rates). Table 16 shows inequality between SC and General Categories of students and Table 17 shows the inequality between OBC and General Categories of students. Both tables show that inequality between General and SC and General and OBC increase as the level of education increases in Bihar. Bihar has the highest inequality between SC and General Students at Upper Primary and Secondary & Higher Secondary level.

Table 15: Inequality in School Attendance Rate (6–17) Years

State	SC/gen	State	ST/gen	State	OBC/gen
Arunachal Pradesh	1.08	Arunachal Pradesh	1.11	Meghalaya	1.11
Maharashtra	1.03	Nagaland	1.10	Nagaland	1.08
Sikkim	1.02	Assam	1.08	Maharashtra	1.03
Goa	1.02	Sikkim	1.00	Assam	1.03
Assam	1.01	Manipur	1.00	Goa	1.02
West Bengal	1.00	Meghalaya	0.99	Himachal	1.01
Telangana	1.00	Himachal	0.98	Telangana	1.01
Tripura	0.99	Goa	0.96	West Bengal	1.01
Manipur	0.98	Tripura	0.96	Jammu & Kashmir	1.01
Jammu & Kashmir	0.98	West Bengal	0.96	Tripura	1.00
Chhattisgarh	0.97	Karnataka	0.95	Sikkim	1.00
Kerala	0.96	Uttarakhand	0.95	Arunachal Pradesh	1.00
Uttarakhand	0.96	Jammu & Kashmir	0.94	Bihar	1.00
Nagaland	0.95	Telangana	0.94	Kerala	0.99
Himachal	0.95	Bihar	0.93	Manipur	0.98
Karnataka	0.95	Maharashtra	0.90	Karnataka	0.98
Haryana	0.95	Tamil Nadu	0.90	Tamil Nadu	0.98
Tamil Nadu	0.94	Uttar Pradesh	0.90	Jharkhand	0.97
Andhra Pradesh	0.94	Jharkhand	0.89	Chhattisgarh	0.96
Uttar Pradesh	0.93	Haryana	0.88	Odisha	0.96
Meghalaya	0.93	Chhattisgarh	0.88	Uttar Pradesh	0.96
Odisha	0.93	Kerala	0.87	Andhra Pradesh	0.95
Bihar	0.92	Andhra Pradesh	0.87	Haryana	0.95
Madhya Pradesh	0.91	Rajasthan	0.86	Madhya Pradesh	0.94
Punjab	0.90	Odisha	0.85	Punjab	0.94
Rajasthan	0.90	Gujarat	0.84	Rajasthan	0.93

State	SC/gen	State	ST/gen	State	OBC/gen
Jharkhand	0.89	Madhya Pradesh	0.81	Uttarakhand	0.89
Gujarat	0.89	Mizoram	-	Gujarat	0.88
Mizoram	-	Punjab	-	Mizoram	-

Note: Here, Inequality is defined as the ratio of indicators for relevant groups and values are ranked.

*Source: Author's Calculation based on NFHS-4, State Reports (2017).*

Table 16: Inequality in Level of Education A

Sl. No.	SC/General			
	Illiterate	Primary	upper primary	secondary & higher Secondary
1	Dadra & N. Haveli	Daman & Diu	Daman & Diu	Puducherry
2	Kerala	Sikkim	Delhi	Arunachal Pradesh
3	Puducherry	Chandigarh	Nagaland	Goa
4	Tamil Nadu	Haryana	Kerala	Daman & Diu
5	Chhattisgarh	Chhattisgarh	Jammu & Kashmir	Dadra & N. Haveli
6	Manipur	Puducherry	Uttarakhand	Jammu & Kashmir
7	Jharkhand	Himachal Pradesh	Telangana	Assam
8	Bihar	Delhi	Maharashtra	Chandigarh
9	Chandigarh	Madhya Pradesh	Tamil Nadu	Uttarakhand
10	Sikkim	Tamil Nadu	Jharkhand	Delhi
11	Odisha	Gujarat	Rajasthan	Meghalaya
12	Gujarat	Odisha	Himachal Pradesh	Nagaland
13	Madhya Pradesh	Jharkhand	Meghalaya	Sikkim
14	Andhra Pradesh	Punjab	Assam	Tamil Nadu
15	Punjab	Tripura	Punjab	Maharashtra
16	Delhi	Bihar	Madhya Pradesh	Tripura
17	Rajasthan	West Bengal	Karnataka	Kerala
18	Uttar Pradesh	Maharashtra	Puducherry	Telangana
19	Haryana	Uttar Pradesh	Manipur	Himachal Pradesh
20	Meghalaya	Nagaland	Goa	Gujarat
21	Telangana	Karnataka	West Bengal	Karnataka
22	Karnataka	Kerala	Haryana	Manipur
23	Maharashtra	Jammu & Kashmir	Odisha	West Bengal
24	Tripura	Rajasthan	Uttar Pradesh	Andhra Pradesh
25	Uttarakhand	Assam	Gujarat	Haryana
26	West Bengal	Telangana	Chandigarh	Punjab
27	Himachal Pradesh	Andhra Pradesh	Tripura	Uttar Pradesh
28	Goa	Uttarakhand	Chhattisgarh	Rajasthan
29	Jammu & Kashmir	Meghalaya	Dadra & N. Haveli	Madhya Pradesh
30	Assam	Manipur	Andhra Pradesh	Chhattisgarh
31	Nagaland	Goa	Sikkim	Jharkhand
32	Arunachal Pradesh	Arunachal Pradesh	Arunachal Pradesh	Odisha
33	Daman & Diu	Dadra & N. Haveli	Bihar	Bihar

Source: Authors' calculation based on NSS (2014).

Figure 2. *Computer Available For Children in Schools* (in Rural Areas)*
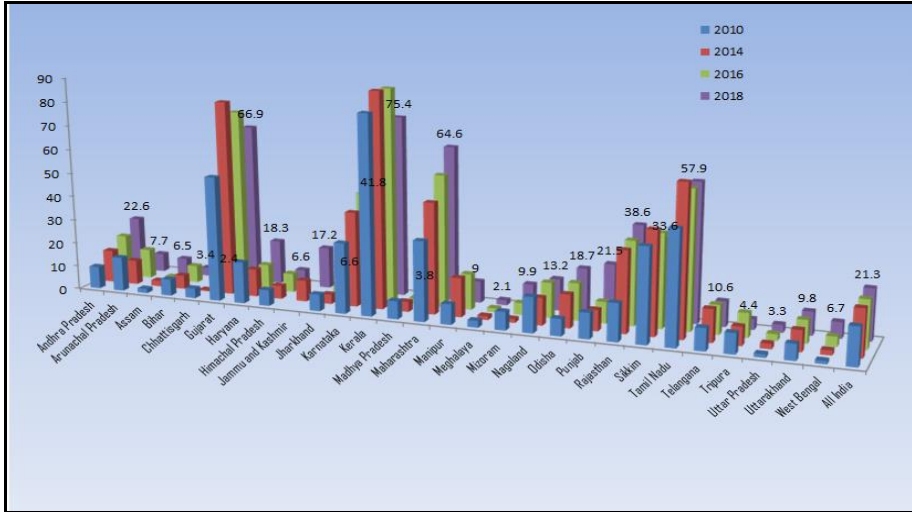
Source: ASER 2018. Note: *As part of the ASER survey, one government school with primary sections was visited in each sampled village. Preference was given to a government upper primary school (Std. I-VII/VIII) if one exists in the village.

Table 17: Inequality in Level of Education B

Sl. No.	Illiterate	OBC/General Primary	Upper primary	Secondary & Higher Secondary
1	Mizoram	Sikkim	Daman & Diu	Puducherry
2	Dadra & N. Haveli	Chandigarh	Nagaland	Arunachal Pradesh
3	Puducherry	Chhattisgarh	Mizoram	Nagaland
4	Chhattisgarh	Puducherry	Delhi	Dadra & N. Haveli
5	Gujarat	Meghalaya	Punjab	Goa
6	Jharkhand	Gujarat	Telangana	Meghalaya
7	Tamil Nadu	Odisha	Karnataka	Sikkim
8	Kerala	Daman & Diu	Chandigarh	Daman & Diu
9	Delhi	Mizoram	Jharkhand	Uttarakhand
10	Meghalaya	Madhya Pradesh	Himachal Pradesh	Delhi
11	Bihar	Uttarakhand	Kerala	A & N Islands
12	Madhya Pradesh	Kerala	Tamil Nadu	Assam
13	Sikkim	Jammu & Kashmir	Maharashtra	Manipur
14	Andhra Pradesh	Tamil Nadu	Odisha	Maharashtra
15	Uttar Pradesh	Bihar	Madhya Pradesh	Tamil Nadu
16	Rajasthan	Delhi	Meghalaya	Karnataka
17	Manipur	Himachal Pradesh	Chhattisgarh	Tripura
18	Telangana	Haryana	Tripura	Haryana
19	Odisha	A & N Islands	West Bengal	Chandigarh
20	Haryana	West Bengal	Rajasthan	Jammu & Kashmir
21	Tripura	Punjab	Assam	Punjab
22	Uttarakhand	Maharashtra	Gujarat	Himachal Pradesh

| Sl. No. | Illiterate | OBC/General | | Secondary & Higher Secondary |
		Primary	Upper primary	
23	Punjab	Uttar Pradesh	Puducherry	Kerala
24	Himachal Pradesh	Rajasthan	Jammu & Kashmir	Telangana
25	Karnataka	Jharkhand	Goa	West Bengal
26	West Bengal	Karnataka	Haryana	Uttar Pradesh
27	Maharashtra	Goa	Uttar Pradesh	Odisha
28	Jammu & Kashmir	Andhra Pradesh	Arunachal Pradesh	Jharkhand
29	Assam	Tripura	Sikkim	Rajasthan
30	Chandigarh	Telangana	Manipur	Andhra Pradesh
31	Goa	Assam	Bihar	Chhattisgarh
32	A & N Islands	Manipur	Andhra Pradesh	Madhya Pradesh
33	Daman & Diu	Arunachal Pradesh	A & N Islands	Bihar
	Nagaland	Nagaland	Uttarakhand	Gujarat
	Arunachal Pradesh	Dadra & N. Haveli	Dadra & N. Haveli	

Source: Authors' calculation based on NSS (2014).

Table 18: Percentage of Students Taking Private Coaching in State/UT

Students taking private coaching for levels other than school education for each State/UT rural + urban					
Sl. No.	State	Percentage	Sl. No.	State	Percentage
1	Tripura	81.2	19	Gujarat	19.4
2	West Bengal	78.4	20	Madhya Pradesh	18.9
3	Daman & Diu	50.8	21	Tamil Nadu	17.4
4	Chandigarh	50	22	Uttarakhand	16.2
5	Bihar	49.5	23	Uttar Pradesh	15.2
6	Odisha	47.9	24	Haryana	15
7	Manipur	35.5	25	Sikkim	13.7
8	Jharkhand	35	26	Karnataka	12.7
9	Delhi	34	27	Andhra Pradesh	10.3
10	Jammu & Kashmir	29.2	28	Rajasthan	10
11	Kerala	26.1	29	Lakshadweep	8.7
12	Maharashtra	25	30	Chhattisgarh	8.1
13	A & N Islands	24	31	Arunachal Pradesh	7.8
14	Goa	23.1	32	Himachal Pradesh	7.6
15	Puducherry	22.4	33	Meghalaya	6.1
16	Punjab	21.3	34	Telangana	5
17	Dadra & Nagar Haveli	20.6	35	Nagaland	3.8
18	Assam	19.6	36	Mizoram	1.9

Source: Authors' calculation based on NSS (2014).

Privation in education is another important feature of education system in India. Thus, it is important to analyse the extent of privation of education across states of India. We have also analysed the pattern of expenditure (as an indicator of extent of private sectors' role in education) by students on coaching. Table 18 shows who bears the burden of education in different states of India. We find that more than 30 percent of

students have to take private coaching even in poor states like Bihar, Odisha and Jharkhand etc. Bihar is among the top five states in terms of percentage of students who take coaching in India. Unfortunately, private coaching can only be accessed by households who are not poor. Thus, the increasing role of private coaching can further lead to a rise in inequality between poor and rich in Bihar (that is already on higher side). Also, in absence of quality education in government schools, students from poor states have to bear higher expenditure on education in terms of expenditure on coaching to compete with students of other states.

Section III: Gender Inequality

Inequality in India can also be seen in terms of gender. India is home of 121 crore population and among them around 48 percent are female/women. Female constitute half of the world's population. However, gender equality is also one of the important agenda of sustainable development, unfortunately gender inequality can be seen in every sphere of the society. Female population continue to be underrepresented at the level of politics and governance in India and states. One can find that females are not able to enjoy similar opportunities and benefits that male population enjoy in India. Women are paid unequally in India compared to men when it comes to hourly wages for labour. As per a recent report by the International Labour Organization (ILO, 2019) on average, women are paid 34 per cent less than men. The gap in wages, known as the gender wage gap, is the highest among 73 countries studied in the report. Studies also show that sometimes women cannot take decisions for themselves. Around 40 percent of women aged 20 to 24 were married before their 18th birthday. Their participation in social, economical and political sphere is highly dependent on factors highly associated with male related situations (e.g. literacy of father). That is why the concept of empowerment has evolved and policies have been designed to empower female population so that they can get equal opportunities to excel in their life.

The lack of women's empowerment is basically a critical form of inequality. At overall level sex ratio is 933. But the level of sex ratio is not similar across states of India and some states are lagging behind. The child sex ratio for 0 to 6 years of age group (918) is lower than overall sex ratio in India. The level of child sex ratio is also not similar across states of India and some states are lagging behind. We also find differences across states in case of age of marriage. We also find difference between male and female in terms of literacy rate. Thanks to government interventions and other factors, literacy rate for female has improved in last couple of years, but around 35 per cent of female population is still illiterate and only 20 per cent of male population are illiterate. We also find differences in terms of literacy rates. Literacy among female is around 91 per cent in Kerala, while it is only 61 per cent in Bihar. Across states, females do work for which they do not get any remuneration (unpaid work). Females have to face inequality starting from birth that continues during their whole lives. In some states, females are deprived of access to proper nutrition, and health care facility and this lead to high mortality rate among female members (either in terms of high Infant

Mortality Rate among girl child or high Mother Mortality Rate). The case of Bihar is given in Table 19.

Table 19: Infant Mortality rate by Sex and Residence

Bihar	Total	Male	Female
2015	42	36	50
2014	42	39	46
2013	43	42	45
Rural			
		Male	Female
2015	42	36	49
2014	43	39	46
2013	44	43	46
Urban			
		Male	Female
2015	44	37	52
2014	37	37	38
2013	34	33	36

Source: Authors' compilation using various years reports of Vital Statistics of SRS Bulletin

Females in most of the states have to face sexual violence and domestic violence. The physical, mental and sexual violence affects women (female) of different ages, and it can be seen in terms of numbers of dowry death cases, domestic violence cases, lower participation of females in labor market, lower participation of female members in social events and low literacy levels. The situation is serious in Bihar. Recent reports of NSS (national sample Survey) and PLFS (2019) on employment-unemployment show continuous decline in female work force participation since 2004-05. It is also seen that age of marriage affects the girls' education. Low education translates into lack of access to technical knowledge and skills and lack of opportunities in the labour market. Thus, a deeper analysis of is required to understand the situation of case of women across states of India.

Women Empowerment Index

To identify that which state is better in terms of women empowerment, the "Women Empowerment Index" (WEI) has been calculated. This index has been calculated using data of NFHS. This index is based on the assumption that women empowerment is inclusive of female' mental, social, household and physical situations. Thus, we have tried to cover variables related to female mental, social, household and physical situations to measure WEI. Women Empowerment index has been calculated using following twelve variables/indicators:

- Women with 10 or more years of schooling (%)
- Women age 20-24 years married before age 18 years (%)
- Women age 15-19 years who were already mothers or pregnant at the time of the survey (%)
- Women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m2)14 (%)

- Currently married women who usually participate in household decisions (%)
- Women who worked in the last 12 months who were paid in cash (%)
- Ever-married women who have ever experienced spousal violence (%)
- Ever-married women who have experienced violence during any pregnancy (%)
- Women owning a house and/or land (alone or jointly with others) (%)
- Women having a bank or savings account that they themselves use (%)
- Women having a mobile phone that they themselves use (%)
- Women age 15-24 years who use hygienic methods of protection during their menstrual period (%).

To calculate the value of WEI, we have compiled data of all twelve variables for all states collected data from NFHS fact sheets. Variables have been transformed to a uniform (0,1) scale to make them comparable using HDI method of normalization of variable. Reciprocals have been taken in the case of negative indicators such as violence to make all indicators unidirectional. Then, the values of all twelve variables have been averaged to arrive at the state's score for WEI. Table 20 and Figure 3 show rank-wise distribution of states of India as per calculated value of WEI. The Table 20 also shows that there is huge inequality across states in terms of value of WEI. Women those are living in Bihar are 550 percent less empowered than women who are living in Sikkim. We find high inequality in case of participation of married women in household decisions, women's access to house and/or land (alone or jointly with others), women's access to mobile phone that they themselves use and women's (of age 15-24 years) access to hygienic methods of protection during their menstrual period.

Table 20: Value of Sate's WEI and their Respected Ranks

State	WEI Value	Rank	State	WEI Value	Rank
Sikkim	0.67	1	Daman and Diu	0.36	19
Lakshadweep	0.61	2	Telangana	0.36	20
Kerala	0.58	3	Karnataka	0.33	21
Chandigarh	0.57	4	Andhra Pradesh	0.31	22
Goa	0.55	5	Maharashtra	0.30	23
Meghalaya	0.48	6	Tripura	0.28	24
Himachal Pradesh	0.48	7	Dadra and Nagar Haveli	0.28	25
Manipur	0.48	8	Gujarat	0.27	26
Puducherry	0.47	9	Haryana	0.27	27
Mizoram	0.47	10	Chhattisgarh	0.25	28
Andaman and Nicobar Islands	0.46	11	Odisha	0.25	29
Punjab	0.45	12	Assam	0.22	30
Tamil Nadu	0.43	13	Jharkhand	0.22	31
Delhi	0.42	14	Uttar Pradesh	0.22	32
Nagaland	0.39	15	Rajasthan	0.21	33
Arunachal Pradesh	0.39	16	West Bengal	0.20	34
Uttarakhand	0.38	17	Madhya Pradesh	0.18	35
Jammu and Kashmir	0.37	18	Bihar	0.10	36

Source: Author's Calculation based on data collected from NFHS 4 Fact Sheets.

Figure 3. *State as Per Women Empowerment Index in India*
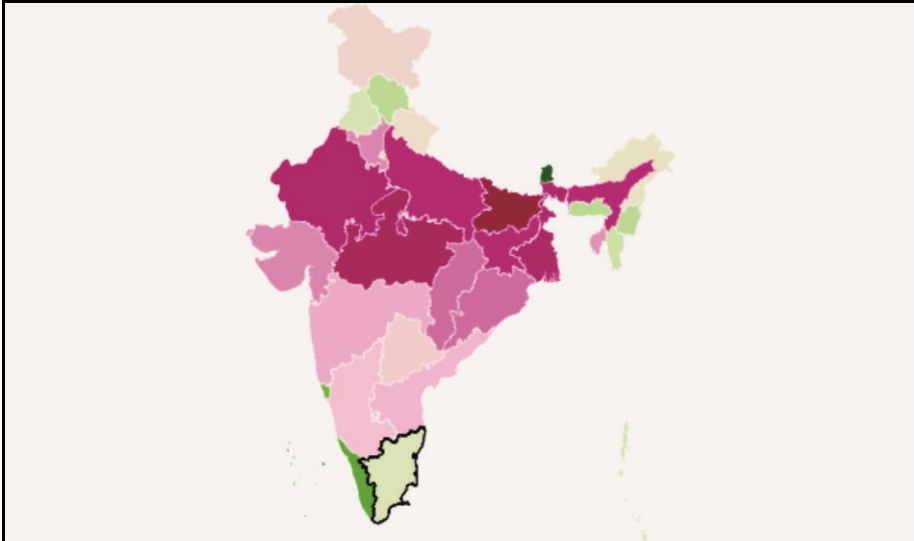
Source: Author's Compilation using NFHS 4 Data. Note: Colour indicates rank, green is on better side and violet is on bad side. Darker of violet is worse and darker of green is best.

Section IV: Health Inequality

Rising health inequality is another important dimension of inequality in the world and India. World Bank country wise data on expenditure on health of year 2017 shows high inequality across countries in terms of per capita current health expenditure on PPP basis (current international $). The value of per capita current health expenditure (on PPP basis and current international $) is 10246 in USA and it is lowest with 37 in D.R. Congo. Neither the situation of India is very good in terms of health expenditure, with a value of only 253 $ (on PPP basis) per capita. We see increase in expenditure on health between 2000 and 2016 at world level. Unfortunately, we find high variability in case of percentage of GDP expenditure on health at the overall world level. We also find a huge inequality across countries in terms of percentage of GDP expenditure on health. This varies from 17 per cent in USA to about 1 per cent in Venezuela. The situation of India is also not satisfactory, as this ratio is only 3.53 per cent. The situation is better in terms of percentage of GDP expenditure on health in Nepal (5.55 per cent) and Sri Lanka (3.81) in comparison to India. As per the W.H.O. governments in countries (at overall level) provide an average of 51% of a country's health spending, while more than 35% of health spending per country comes from out-of-pocket expenditure. Unfortunately, this ratio is very high in case of India (around 62 percent in year 2017). The poor health conditions also can be

seen in terms of availability of health personnel in India. The Employment and Unemployment Survey of 2017–18 reveals some important points related to availability of total health personals in India and states: total personnel in all human health activities working in institutions with some inpatient facility is around 26.3 lakh, of which 72% works are working in urban areas. Only 44% or 11.6 lakh workers are working in public sectors. This shows high inequality between rural and urban areas in India. The employment figures also show inequality in terms of availability of health personnel per 10,000 people. It is 19.6 for all India. But, it varies from 49 for Kerala to 26 for Punjab and 6.8 for Bihar and 8.9 for Uttar Pradesh.

NITI Aayog has released a report on the health index in June 2019 highlighting the extreme disparity across states. This report shows that while the health situation in Kerala is comparable to Brazil or Argentina, the situation in Odisha is similar to that in Sierra Leone. The top five states are Kerala, Andhra Pradesh (undivided), Maharashtra, Gujarat, and Punjab, and the bottom five states are Uttarakhand, Madhya Pradesh, Odisha, Bihar, and Uttar Pradesh in that order. Regional inequality often hides the social inequality in healthcare, especially in policy formulation and planning, if there is any. The worst sufferers—both in access to and outcome in healthcare—are those belonging to the Scheduled Caste (SC) and Scheduled Tribe (ST) social categories.

Here, we have analysed health inequality across states of India in terms of health expenditure as a percentage of total state expenditure, per capita health expenditure, health expenditure as a percentage of GSDP (Gross State Domestic Product). We find that Bihar is the worst performer in the case of per capita health expenditure, and second worst performer in case of health expenditure as a percentage of total state expenditure (Table 21). We have also tried to see how lowest per capita expenditure on health is affecting the availability of government hospitals and number of beds in government hospitals in Bihar. Table 22 shows that in terms of per crore numbers of hospitals, Delhi is worst performer in India. But in terms of numbers of beds available in government hospitals, Bihar is the worst performer across states of India. Table 23 shows availability of doctors per crore in rural areas of states of India. We find that Bihar is among top five lowest in terms of number of specialists at CHCs in India. The overall dimensions shows that even there is growth in SDP (State Domestic Product), still expenditure on health per population is very low in Bihar. Thus people who are in Bihar are getting low health security than other states of India.

Table 21: Ranks of State as per Expenditure on Health: Per Capita, as share of Total State Expenditure and as share of GSDP for all State & Union Territories, 2015-16

Rank	State/UT	Health Expenditure as a % of Total State Expenditure	State/UT	Per Capita Health Expenditure (Rs)	State/UT	Health Expenditure as a % of GSDP
1	Delhi	11.45%	Andaman & Nicobar	6201	Andaman & Nicobar	5.23%
2	Puducherry	8.82%	Lakshadweep	6018	Mizoram	4.20%
3	Mizoram	8.34%	Mizoram	5862	Arunachal Pradesh	3.29%
4	Assam	7.08%	Arunachal Pradesh	5177	Nagaland	2.97%
5	Meghalaya	6.73%	Sikkim	5126	Manipur	2.79%
6	Himachal Pradesh	6.67%	Goa	3643	Jammu & Kashmir	2.46%
7	Tripura	6.62%	Puducherry	3540	Tripura	2.41%
8	Goa	6.07%	Himachal Pradesh	2667	Meghalaya	2.40%
9	Uttarakhand	6.07%	Dadra & Nagar Haveli	2451	Assam	2.21%
10	Jammu & Kashmir	5.93%	Nagaland	2450	Puducherry	2.13%
11	Punjab	5.87%	Jammu & Kashmir	2359	Sikkim	1.81%
12	Gujarat	5.86%	Chandigarh	2224	Himachal Pradesh	1.68%
13	Kerala	5.85%	Meghalaya	2225	Rajasthan	1.44%
14	Nagaland	5.79%	Tripura	2183	Uttar Pradesh	1.42%
15	Arunachal Pradesh	5.73%	Daman & Diu	2073	Goa	1.34%
16	Sikkim	5.66%	Manipur	2061	Bihar	1.33%
17	Rajasthan	5.61%	Delhi	1992	Chhattisgarh	1.33%
18	Manipur	5.45%	Uttarakhand	1785	Chandigarh	1.32%
19	West Bengal	5.33%	Assam	1546	Jharkhand	1.25%
20	Chhattisgarh	5.28%	Kerala	1468	Odisha	1.19%
21	Maharashtra	5.08%	Rajasthan	1360	Uttarakhand	1.06%
22	Uttar Pradesh	5.07%	Chhattisgarh	1334	Madhya Pradesh	1.04%
23	Karnataka	5.03%	Telangana	1322	Kerala	0.95%
24	Tamil Nadu	4.99%	Tamil Nadu	1238	Punjab	0.87%
25	Jharkhand	4.82%	Gujarat	1189	Andhra Pradesh	0.82%
26	Telangana	4.80%	Punjab	1173	Telangana	0.82%
27	Odisha	4.80%	Karnataka	1124	Delhi	0.78%
28	Andhra Pradesh	4.70%	Haryana	1119	Tamil Nadu	0.74%
29	Madhya Pradesh	4.17%	Andhra Pradesh	1013	Gujarat	0.72%
30	Bihar	3.94%	Maharashtra	1011	Karnataka	0.69%
31	Haryana	3.59%	Odisha	927	Haryana	0.63%
32	Andaman & Nicobar	N.A	Jharkhand	866	Maharashtra	0.60%
33	Chandigarh	N.A	West Bengal	778	West Bengal	N.A
34	Dadra & Nagar Haveli	N.A	Uttar Pradesh	733	Dadra & Nagar Haveli	N.A
35	Daman & Diu	N.A	Madhya Pradesh	716	Daman & Diu	N.A
36	Lakshadweep	N.A	Bihar	491	Lakshadweep	N.A

Note: (Rank 1 shows best and Rank 36 shows worst across 36 States/UT)

Source: Authors' Calculation based on data collected from National Health Profile 2019.

Table 22: Ranks of State as per Number of Government hospitals and Number of beds in Government Hospitals per lakh Population

Rank	Hospitals	Beds	Rank	Hospitals	Beds
1	Arunachal Pradesh*	Lakshadweep	19	Telangana*	West Bengal
2	Lakshadweep	Chandigarh	20	Uttar Pradesh*	Uttarakhand
3	Himachal Pradesh*	Puducherry	21	Daman & Diu	Rajasthan *
4	Mizoram*	A&N Island	22	Nagaland	Punjab*
5	A&N Island	Sikkim*	23	West Bengal	Telangana*
6	Sikkim*	Goa*	24	Tamil Nadu*	Jammu & Kashmir
7	Meghalaya*	Mizoram*	25	Jharkhand	Assam *
8	Karnataka*	Himachal Pradesh*	26	Jammu & Kashmir	Manipur
9	Uttarakhand	D&N Haveli*	27	Puducherry	Andhra Pradesh
10	Odisha*	Arunachal Pradesh*	28	Bihar	Maharashtra
11	Tripura*	Meghalaya*	29	Manipur	Haryana*
12	Rajasthan *	Delhi	30	Chandigarh	Odisha*
13	Assam *	Tripura*	31	Chhattisgarh	Madhya Pradesh
14	Kerala	Karnataka*	32	Gujarat	Uttar Pradesh*
15	D&N Haveli*	Kerala	33	Delhi	Chhattisgarh
16	Goa*	Tamil Nadu*	34	Madhya Pradesh	Gujarat
17	Haryana*	Daman & Diu	35	Maharashtra	Jharkhand
18	Punjab*	Nagaland	36	Andhra Pradesh	Bihar

Note: (Rank 1 shows best and Rank 36 shows worst across 36 States/UT).

*Source: Authors' Calculation using data collected from National Health Profile 2019 and Census 2011. Notes: Government hospitals include Central Government, State Government and Local Government bodies * PHCs are also included in the number of hospitals.*

Table 23: Rank wise Distribution of State as per Numbers of Doctors at PHC and Specialists at CHCs in Rural Areas as Per Crore Population

S. No.	No. of Doctors^ at PHCs	Total Specialists at CHCs	S. No.	No. of Doctors^ at PHCs	Total Specialists at CHCs
1	Maharashtra	Rajasthan	19	Chhattisgarh	Uttarakhand
2	Tamil Nadu	Karnataka	20	Jharkhand	Haryana
3	Rajasthan	Maharashtra	21	Uttarakhand	Goa
4	Karnataka	Andhra Pradesh	22	Manipur	Meghalaya
5	Andhra Pradesh	Jammu & Kashmir	23	Meghalaya	Nagaland
6	Bihar	Odisha	24	Arunachal Pradesh	Puducherry
7	Assam	Madhya Pradesh	25	Tripura	Arunachal Pradesh
8	Uttar Pradesh	Tamil Nadu	26	Nagaland	Himachal Pradesh
9	Gujarat	Uttar Pradesh	27	Mizoram	Manipur
10	Kerala	Assam#	28	Goa	Daman & Diu

S. No.	No. of Doctors^ at PHCs	Total Specialists at CHCs	S. No.	No. of Doctors^ at PHCs	Total Specialists at CHCs
11	Madhya Pradesh	West Bengal	29	Puducherry	Tripura
12	Telangana	Gujarat	30	A& N Islands	
13	West Bengal	Telangana	31	Sikkim	
14	Odisha	Punjab	32	Delhi	
15	Jammu & Kashmir	Jharkhand	33	D & N Haveli	
16	Himachal Pradesh	Bihar	34	Lakshadweep	
17	Haryana	Chhattisgarh	35	Daman & Diu	
18	Punjab	Kerala			

Note: ^Allopathic Doctors. (Rank 1 shows best and Rank 35/29 shows worst across States/UT).

Source: Authors' Calculation based on data collected from National Health Profile 2019.

Conclusions

Overall, this paper tried to analyse the nature and extent of inequality across states of India and tries to indicate the position of Bihar in India. This study is based on secondary data collected from various sources including NSSO, NFHS and other government/non-government documents and reports. The study analysed inequality under four themes: livelihood, education, health and gender. Overall the analysis found that even some positive changes can be seen in terms of enrolment in primary education but productivity of education is lowest in Bihar. State government has invested money in attracting students to schools but because of low per capita expenditure on education the access to facilities like computer among students is lowest in Bihar. And inequality can also be seen in education attainments across caste categories in Bihar. In case of health expenditure people of Bihar has to bear very high per capita out of pocket expenditure. However, Bihar has achieved higher growth in last couple of years, but, still the level of female empowerment is very low in Bihar. Overall, we find that growth have not reduced inequality across states in India. And, still poor state like Bihar is facing serious challenge related to livelihood, education, women empowerment and health and, due to this out migration from this state is highest across states in India.

References

ASER (2018). *Annual Status of Education Report* (ASER).

EnviStats - India (2018). *EnviStats - India.* Prepared by Ministry of Statistics and Programme Implementation.

Health Index (2019). *Healthy States Progressive India: Report on Rank of States and Union Territories.* Ministry of Health & Family Welfare, Niti Aayog.

Health Sector Financing by Centre and States/UTs in India 2015-16 to 2017-18, National Health Accounts Cell, Ministry of Health & Family Welfare.

ILO (2019). *Global Wage Report 2018/19, What Lies Behind Gender Pay Gaps.* International Labour Office.

Mishra, U. S., & William, J. (2020). Household Assets and Wealth Quintiles, India 2006–16. *Economic & Poilitical Weekly*, 55(6), 77.

NSS (2014). Education in India. National Sample Survey Organisation, 71st Round, Report number 575(71/25.2/1).

NSS (2019). Key Indicators of Household Social Consumption in India: Health. National Sample Survey Organisation.

OXFAM (2018). *Reward work, not wealth*. Oxfam Briefing Paper Summary.

PLFS (2019). Annual Report Periodic Labour Force Survey (PLFS) (July 2017 and June 2018). Ministry of Statistics and Programme Implementation. N.S.O.

State Finances (2019): A Study of Budgets, Reserve Bank of India.

Suhag, R., & Tiwari, S. (2018). *State of State Finances*. PRS Legislative Research Institute for Policy Research Studies.

THE IMPACT OF OCCUPATIONAL SEGREGATION ON OCCUPATIONAL GENDER PAY GAP IN THE EUROPEAN UNION

Bianca BULIGESCU[1]
Lex BORGHANS[2]
Didier FOUARGE[3]

Abstract*: The aim of this paper is to analyse the relationship between wages and the fraction of women in an occupation, using variation in the female participation in occupations across European countries. Using data from the European Structure of Earnings Survey 2006 with information about the wages in 93 occupations in 10 countries, we investigate how the wages of men and women and therefore the gender wage gap varies when the fraction of women increases. We allow for non-linearities in this relationship. In the raw data we find that mixed occupations pay better than occupations in which mainly men or mainly women are working, but controlling for occupation the picture reverses and we find that especially occupations with a high fraction of women pay more than mixed occupations. Female earnings are almost similar to male earnings when the fraction of women goes down and vice versa, but the effect is stronger in the female occupations, giving men an advantage in the labour market..*

Keywords: *gender segregation, gender wage gap, occupational wages*

Introduction

The gender wage gap, the difference in pay between women and men, is for a substantial part explained by the different occupation men and women work in (occupational segregation). This leads to the question whether on the one hand women self-select into occupations that require fewer skills or are intrinsically more attractive

---

and therefore require less pay as compensation, or on the other hand wages in female jobs are lower because of the presence of many women. Since it is impossible to fully characterize occupations in order to control for such variation, more insight could be gained when the fraction of women in occupations could be varied. To answer this question this paper uses data from the European Structure of Earnings Survey 2006 with information about the wages in 93 occupations in 10 countries. We investigate how the wages of men and women and therefore the gender wage gap varies when the fraction of women increases. This paper brings to the existing literature three novelties: first, the research strategy used to rely on cross country variation is new, second, it allows for non-linearity in the effect of occupational segregation on the gender wage gap as most papers find a negative effect and third, the study is conducted at a detailed occupational ISCO 3 digits, while few studies in the world are conducted like this due to the fact that they require a huge sample (Strawinski, et al., 2018).

First, the research strategy relies on cross-country variation in order to find a causal effect which is new to the literature. We assume that occupational characteristics are the same across European countries and therefore the quality of the occupation and skills associated with it are held fixed. Further we assume that skills differences are similar across countries for each gender and we control for skills and all possible occupational characteristics. The tastes and preferences for a certain occupation can vary across countries. However, we assume that, on average, selection of women into occupations would be similar across European countries given common past and shared values. All these assumptions allow us to recover the causal effect.

Second, the functional form of the relationship between occupational segregation and the gender wage gap is not straightforward (Strawinski et al., 2018). Most papers argue that the relationship is linear, meaning that female occupations pay less than male occupations (for a review see Perales, 2010). Few other papers find a non-linear relationship between sex composition and wages where the highest wages for both men and women are earned in mixed or integrated occupations (Cotter et al., 2004; Hakim, 1998 cited in Strawinski et al., 2018; Magnusson, 2013).

Third, due to lack of comparable data across countries, few studies look at gender differentials due to occupational segregation in an international perspective (Burchell et al., 2014; Plasman, Sissoko, 2004; Hook, Petit 2008, Oostendorp, 2004). In the raw data we find that mixed occupations pay better than occupations in which mainly men or mainly women are working, but controlling for occupation the picture reverses and we find that especially occupations with a high fraction of women pay more than mixed occupations.

This paper contributes to the literature about the role of segregation in the gender wage gap. Despite a significant reduction in the differences in pay between males and females in a number of European Countries over the past decades, the differential in pay is still significant and the occupational segregation large (Burchell et al., 2014, Plasman, Sissoko 2004). Occupational segregation has been identified as one of the important factors responsible for the persistence of gender pay gap and therefore investigating the relationship between occupational segregation and gender pay gap is important from a policy perspective (Gupta, 1993).

The remainder of this paper is organized as follows. Section 2 provides a brief overview of the theories and recent empirical findings concerning the relationship between occupational segregation and gender pay gap. Section 3 provides a description of the methodology used in this study, its main assumptions and the implications. Section 4 describes the European structure of earnings data, its strengths and limitations. Section 5 discusses the results. And section 6 concludes by discussing the relevance of this study in light of the previous literature.

A Brief Literature Review

The gender pay gap is the differential in pay between men and women. The unadjusted gender pay gap shows the difference between average gross hourly earnings of women paid employees as a percentage of average gross hourly earnings of men paid employees. According to Blau and Kahn (2017: 791), in the USA, by 2014, women full-time workers earned about 79 percent of what men did on an annual basis and about 83 percent on a weekly basis. In the EU, in 2020, the gender pay gap accounted for 85.2% in the unadjusted form: that is, women earn 14.8% less than men for both full-time and part-time workers[1]. The gender wage gap has significantly decreased during the last three decades. Brynin and Perales (2016:163) link the narrowing of the gender wage gap as the result of the growth in female skills, the spread of egalitarian gender ideologies and mainstreaming policies.

Blau and Kahn (2017: 826) report that while the Duncan Segregation Index[2] declined by over 10 percentage points in the 1970s and 1980s, it declined by just over 3 percentage points in the following two decades (Baker, Cornelson, 2018). The index tells us that the overall segregation of males and females remains substantial: in recent years, over half of men (or women) in the USA would need to change occupations for the occupational distributions of male and female employment to be the same (Baker, Cornelson, 2018). In the EU 27, the index was 50.9 in 2007, lower by almost 2% compared to the USA, however there are substantial country differences. Austria, the Czech Republic, Denmark, Norway, Sweden and the United Kingdom experienced relatively fast de-segregation. In contrast, segregation increased in Bulgaria, Ireland, Italy, Latvia, Romania and Spain (Bettio, Verashchagina 2009). Blau and Kahn (2017) find that, since the 1970s, in the USA, women have reduced (but not eliminated) their overrepresentation in administrative support and service jobs like teaching and nursing and made significant inroads into management and male professions. In the EU, the women's share within some occupations is still minor, for example in constructions, engineering, ICT, building and related trades, electrical and electronic trades, metal, machinery and related trades, agriculture, machinery mechanics etc. (Council of the European Union, European Institute for Gender Equality, 2017). Professions in

---

[1] The USA figure and the EU figure are not directly comparable as they are calculated differently, but they give an indication of the importance of the gender pay gap.

[2] The Duncan Segregation Index measures occupational segregation. It ranges from 0 to 100, where 0 indicates no segregation and 100 complete segregation. It calculates the percentage of women who would have to change jobs for the occupational distribution of women and men to be the same.

healthcare, law and human resources are examples of higher-level occupations in which women's presence has greatly increased (Council of the European Union, European Institute for Gender Equality, 2017). Female dominated occupations are in pre-primary education, nursing or midwifery, secretarial and personal care work, domestic and related help etc.[1] (Council of European Union, European Institute for Gender Equality, 2017). Burchell et al. (2014) find that 18% of women work in mixed occupations, 69% of women work in female dominated occupations and 13% work in male dominated occupations. By contrast, 15% of men work in mixed occupations, 59% work in male dominated occupations and 26% work in female dominated occupations. Therefore, there is still substantial occupational segregation in the European Union.

Despite the decrease, changes in the occupational structure have benefited exclusively high educated women having graduate jobs (Blau, Kahn, 2017; Brynin, Perales, 2016). Conventional human capital variables taken together explain little of the wage gap, due to a convergence in education between men and women (ILO, 2018), while gender differences in occupation and industry[2] continue to be important and they explain substantially more than newer explanations based on psychological attributes and non-cognitive skills (Bettio, Verashchagina, 2009; Blau and Kahn 2017; Goldin, 2014; Levanon, Grusky, 2016). Blau and Kahn (2017: 827) find that occupations explain 1/3 of the gender wage gap and together with industry they explain half of the gender wage gap. The gender wage gap is for a substantial part explained by the different occupation men and women work in.

There are seven theories which can explain the relationship between occupational segregation and the gender wage gap: human capital, discrimination, compensating wage differentials, non-compensating wage differentials, crowding, devaluation and the role of the trade unions as institutions which have a role in reducing the gender pay gap.

The first theory is that of human capital. In a nutshell, Polacheck (1981) extends the basic human capital theory using a hedonic price approach to incorporate occupational choice in order to make predictions about the occupational distribution (occupational segregation). Polacheck argues that women would purposefully choose those occupations with the smallest loss of human capital during periods of out of the labor market career interruptions. Gorlich and de Grip (2009) look at occupational depreciation rates by type of occupation (female, male and integrated) and by skill level (low skilled, high skilled) in Germany. The study takes into account the penalty in the short run and in the long run for maternal leave. The authors find evidence supporting Polacheck's thesis for the short run depreciation in high skilled occupations suggesting that human capital depreciation rates are lower in female occupations than in male occupations. This result does not hold for low-skilled occupations however, suggesting that gender roles may explain segregation in low skilled occupations between men and women. England (1982), Corcoran et al. (1984) and Blau and Ferber (1991) argued that career interruptions are not responsible for occupational segregation. Even if women

---

[1] http://data.consilium.europa.eu/doc/document/ST-14624-2017-ADD-2/en/pdf
[2] See Table A1 and Graph A1 measuring occupational segregation in EU countries using the Duncan Index of dissimilarity and proportion females by occupation.

seek jobs that require less training, that is not a reason to expect them to cluster in a particular group of occupations since many male occupations also require less training or skills. Furthermore, women's rates of depreciation and wage growth are similar in female and male dominated occupations. Human capital variables refer to education and experience like job tenure. These variables are included in the models tested. Moreover, we control for part-time in the models since a large part of women have part-time employment in order to be able to combine work with raising children.

Others have investigated the gender pay gap between occupations from a discrimination perspective. Discrimination can arise from: 1) prejudice, 2) market power (monopsonies or trade unions), and 3) imperfect information. All these are obstacles to perfect competition. The presence of discrimination can be linked to: a) an aversion felt by employer towards a certain group (Becker, 1957), b) the unobservability of individual characteristics which can provoke discriminatory firm's behavior (Arrow, 1973; Phelps 1972), or c) the use of supplementary information or beliefs on the average quality of a demographic group or another. The effects of discrimination can accumulate over the life cycle model. It can occur in training, promotion, or pre-market conditions such as schooling and occupational choice. Traditionally, engineering, physics, the judiciary, law and health service administration are considered "male" jobs and library work, nursing and teaching (especially in primary education) are considered "female" jobs (ILO, 2004). There is evidence showing that women who choose non-traditional jobs can face special constraints in the workplace, not least of which are isolation, limited access to mentoring and sexual harassment (ILO, 2004). The study of discrimination has been based on using Blinder-Oaxaca decompositions of the wage into an explained part and an unexplained part. For a recent decomposition of the gender pay gap into an explained part and an unexplained part using the Blinder-Oaxaca decomposition on Structure of Earnings data see Boll and Lagemann (2018: 22).

Occupations differ in many aspects from one another such as: the education and training required, the pleasantness or disagreeability of the work, the status and prestige in which the occupation is held, the probability of success in that line of work and the level of wages in the occupation. Occupational gender pay differentials could be a result of a compensating wage mechanism. According to this theory, women prefer occupations with good working conditions and therefore receive less compensating wage premiums, or they prefer jobs with good fringe benefits and therefore receive less pay. This theory makes several predictions: a) the size of the compensating wage differential for a particular occupation depends on the strength of demand for that occupation, b) the productivity of every job is an increasing and concave function of effort and wages increase with effort, therefore perfect competition ensures that these differences in difficulty of work will be compensated for by wage differentials, c) a competitive market should generate a trade-off between the amount of wages and benefits received by workers of equal productivity if the total dollar value of compensation per hour is to be equal. More recently, Goldin (2014), using a compensating wages theoretical model, and the O*Net database on occupational characteristics coupled with information from Census for the USA have highlighted the linearity of the wage schedule with respect to hours worked as a measure of family-friendly professions. Goldin (2014) argues that the gender pay gap would entirely

vanish if firms did not have an incentive to disproportionately reward individuals who labored long hours and worked particular hours and if they would enhance temporal flexibility. She argues that some workers want the amenity of flexibility or of lower hours and some firms may find it cheaper to provide. Looking at top earning occupations, she demonstrates that some occupations have high penalties for even small amounts of time out of the labor force and have nonlinear earnings with respect to hours worked, while other occupations, however, have small penalties for time out and almost linear earnings with respect to hours worked. She argues that this is due to information costs and the easiness of substituting workers one for the other.

McPherson and Hirsch (1995) and Baker and Fortin (2001) incorporate in their models controls for occupational physical demands, strength physical demands and environmental hazards in order to control for compensating wage differentials. When McPherson and Hirsch (1995) control for job characteristics, they obtain a substantial reduction in the wage penalty for female jobs in the US and they interpret this as evidence that the relationship between occupational segregation and wages is weak and driven by other job characteristics and differences in the unobserved skills of workers in female and male jobs. Baker and Fortin (2001) replicate and improve on their study, finding even stronger results for Canada. When they control for occupational characteristics, the penalties for female work are driven to zero.

To control for compensating wage differentials we introduce occupational dummies in the models that capture all the occupational characteristics.

Another market based explanation views gender differentials as a result of non-compensating wage differentials that serve to reflect the changing conditions in the economy. If labor is scarce in particular occupation, then this should be reflected in a higher wage rate, whilst abundance of labor will drive the wages down. If the skills required for a particular occupation can be acquired quickly and easily then the supply of labor will be abundant. Low wages reflect therefore the abundance of supply relative to demand for this particular occupation. Non-compensating wage differentials should disappear if labor is sufficiently mobile between occupations. Occupational mobility is difficult to achieve due to: the fact that it takes time to acquire new skills and qualifications, many professions have entry barriers, and some workers may not have the necessary ability to acquire the qualifications for a certain profession. If there are barriers impeding the movement of labor between men's' and women's' jobs, then the labor market is effectively divided into two sections. Wage differentials cannot perform their allocative function redistributing labor between occupations. Men's' higher earnings will persist if their occupation is one in which women find it difficult to move to.

Bergmann's (1974) crowding model is based on the assumption that employers discriminate against women by excluding them from occupations considered men's work. This model does not assume discrimination against the individual but rather against certain types of occupations. The model predicts that wage discrimination is rather across occupations and industries (Boeri, Van Ours, 2013: 105). Given that the demand is limited in "male" occupations, women are crowded in "female" occupations, thereby increasing the supply and reducing their wage. If women are not allowed to enter certain occupations, they will crowd in other occupations driving the wages down

(Boeri, Van Ours, 2013: 105). The barriers to enter certain occupations may come from unions, customs or self-selection (Boeri, Van Ours, 2013: 105). This model predicts that those doing women's' work earn less than those doing men's' work, despite similar education qualifications, as a result of occupational segregation.

The result of occupational segregation is that the women dominated occupations are overcrowded, in the sense that the marginal productivity of labor is lower in that occupation and the total output could be increased by lowering employment in the female dominated occupations and shifting some labor to the other occupation (Bergmann, 1975).

Crowding may occur because individuals prefer a particular occupation as utility maximizers or because employers behave in a way that excludes individuals from a certain type of occupation (Solberg, Laughlin, 1995). If this hypothesis is true, there should be a gap across occupations but no gap within occupations (Solberg, Laughlin, 1995). There is both a gap across occupations which we look at and within occupations due to glass ceiling.

This hypothesis has been tested by incorporating the proportion of female in human capital earnings reduced form equation. Two levels of analysis have been used: occupational wage models or individual wage models (Sorensen, 1990). Other tests for this hypothesis had relied on occupational switchers using panel data models, however occupational changes in household panels are often spurious and there is a significant measurement bias which can hide effects. Contrary to previous work which assumed the effect to be linear, we hypothesize that the effect is in fact non-linear and we introduce the percentage women square in the models.

The seventh theory is the devaluation theory which argues that wage inequality is socially constructed and work in female-dominated occupations is undervalued as a result of institutionalized bias against women (Perales, 2013). Devaluation theory argues that work in female-dominated occupations is undervalued: "the higher the percentage of females in an occupation, the less the job pays" (England, 1992: 125 cited in Magnusson, 2013). In other words, women's' jobs require similar skills to males' jobs, but they are undervalued. The comparable worth literature suggests the devaluation of caring and nurturing skills traditionally associated with women (Perales, 2010). This institutionalized bias against women leads to wages being lower in women occupations as a result (England, 1992 cited in Perales, 2010). Magnusson (2013) tests the devaluation theory using the Swedish register data and finds that men and women wages are the highest in integrated occupations; she also finds a nonlinear effect of the occupational segregation on the wages. The author also studies the wage payoffs of people moving across occupations with varying sex compositions and finds that both sexes gain by moving to relatively sex-integrated occupations (about 25 to 54% female).

The role of trade unions on the wage structure and gender pay gap is well researched in the literature. Card et al.(2020) find that there has been a rise in the share of women among the unionized workers and that currently half of the unionized workers in North America are women. Moreover, the authors find that once they disaggregate by sector, the effect of unions on male and female inequality no longer differs, and that the key

difference in union impacts are between the public and the private sector, not between males and females. Card et al. (2020) state that historically, both in the USA and Canada, union jobs were held largely by unskilled or semi-skilled men working in sectors such as manufacturing, transportation, construction, forestry and mining, but that changed with the steady decline in private sector unionization and rising union influence in the public sector, union coverage rates are now five times higher in the public sector. Moreover this changed the profile of the union worker being a female teacher or nurse with a university degree than a male factory worker with only a high school education (Card et al. 2020). The authors argue that a consistent finding in Canada, the US and the UK is that unions tend to reduce wage inequality among men but not among women. Therefore, we add as controls in the wage regressions on gender pay gap trade union coverage.

The Econometric Model

The main aim of this paper is to estimate the relationship between the fraction of men and women in a job and the wage controlling for differences between occupations. As far as skills determine wages, there could be occupations in which typical male skills are needed. This will be due to self-selection the occupations with low fractions of women. On the other side of the spectrum there will be occupation with many women in which female skills are required. Other jobs will require skills that can be acquired by both men and women. To capture these three relevant segments in the comparison of occupations, we apply a quadratic term when including the fraction of women in a job.

Drawing on human capital theory and compensating wage differentials, we include both individual and occupational characteristics in our model of wages. However, contrary to previous attempts which try to distinguish between types of occupational hazards and physical strength, our approach relies on cross-country variation. The assumption made to ensure identification is that at the same moment in time the characteristics that cause women to enter occupations are the same in every country. Therefore, we implicitly assume that European countries are similar in terms of technological advances and tools used in an occupation, in other words, that being a nurse in the Czech Republic is going to be as difficult as being a nurse in Sweden. Further, we assume that wages have different starting levels across countries as some countries are wealthier than others. We also assume that the relative position of occupational wages in the occupational structure is the same across European countries, in other words, that nurses earn 22% less compared to computer professionals in every European country. These assumptions are verified by the data at hand as can be seen from Graph A1 in the Appendix.

Wages in an occupation can be seen as being dependent on both observable and unobservable (to the econometrist) characteristics as follows:

$$\ln W_{of} = \alpha_{of} + \sum \beta_{kf} x_{okf} + \delta FEM_{of} + \phi FEM_{of}^2 + \sum \lambda CNTRY_{of} + \sum \tau OCC_{of} + e_{of}$$

$$\ln W_{om} = \alpha_{om} + \sum \beta_{km} x_{okm} + \delta FEM_{om} + \phi FEM_{om}^2 + \sum \lambda CNTRY_{om} + \sum \tau OCC_{om} + e_{om}$$

$$\ln(W_{of}/W_{om}) = \alpha_{og} + \sum \beta_{kg} x_{okg} + \delta FEM_{og} + \phi FEM_{og}^2 + \sum \lambda CNTRY_{og} + \sum \tau OCC_{og} + e_{om}$$

where:

- W_o are the wages in profession O of gender j,
- α_o is a constant,
- X_o are workers average observable characteristics in occupation O, such as average experience required in an occupation proxied by age, average education, tenure, density of union coverage, average part-time work in an occupation,
- β_o are prices related to the remuneration of (observable) characteristics for gender j in occupation O. Prices can be time specific or not, gender specific or not,
- FEM_o is the ratio of female total employment in the workers occupation,
- δ_o is the price related to remuneration of the composition of females in occupation O,
- $CNTRY_o$ are country dummies,
- OCC_o are occupational dummies which cover occupational characteristics such as hazards and characteristics of tasks such as physical strength,
- e_o are errors, including the effects of all unobservable characteristics of Occupation O on wages.

Since the precision of our wage data depends on the size of occupational cells, we use a weighted least squares approach in our estimations. The weighting yields more precise coefficient estimates as equally weighting would place a higher weight on very small occupations and too little weight on large occupations for that gender.

The weighted least-squares estimator for the regression of yoi on xoi with the weights woi is given by:

$$\hat{\beta}_w = (\sum_{i=1}^{N} w_i x_i x_i')^{-1} \sum_{i=1}^{N} w_i x_i y_i$$

We weight female wages by the number of women in an occupation and male wages by the number of men in an occupation using analytical weights[1]. Occupational gender pay gaps are weighted by the total number of workers in that occupation. Weighting the grouped data by the occupational size, we obtain similar coefficients to individual level regressions (Angrist, Pischke, 2008: 66).

---

[1] We also tried specifications using total occupational sizes but the results did not differ significantly when changing the weight.

The ESES Data

We use the European Structure of Earnings Survey (ESES)[1] data for 2006. This is a comparative matched employer-employee survey carried on by national member states of the European Union. The data collection follows a common methodology which makes the comparative dimension very appealing, especially the common denomination of occupations that follows ISCO 88 classification.

The common methodology employed by the European Structure of Earnings makes international comparisons easier. The information is collected from the management of the establishments which makes it highly reliable. The information for the following countries is available for detailed 3 digits occupational level: Czech Republic, Hungary, Poland, Slovakia, Lithuania, Latvia, Spain, France, Norway and Sweden. The data has the following strengths: large sample sizes (the smallest sample is 83884 observations for Lithuania, the largest is Czech Republic 624031 observations), comparable methodology useful for international comparisons, detailed information about wage components and establishments, and high reliability.

There are two truncations in ESES data: the firm sizes smaller than 10 are missing (for France, Italy, Portugal and Sweden). The second truncation is the missing data on L sector of public administration and compulsory social security contributions (for Spain, France, Italy, Portugal, Norway). The first truncation on small firms could have an impact for the estimates of some countries, particularly if more women are sorting into small firms. Schmitt and Lane (2009) provide an indication of the importance of small firms across European countries. This truncation is expected to be important especially for firms from Italy, Spain and Portugal. Evidence from the European Community Household Panel seems to suggest that this would bias downward the estimate of gender pay gap for these countries (Dupuy et al., 2009). The second truncation on public administration sector could bias the estimates upwards. This is because those jobs are predominantly occupied by women and the gender pay gap is smaller in the public sector as wages are fixed for positions. In 2006, in Hungary, this sector represented 26% of employees and for Czech Republic, this sector was about 13%, for Lithuania 8%, Poland 7%, and Slovakia 7%. We would expect that the effect would be quite big in Hungary as a large part of the population is employed in public administration. However, for analytical purposes, excluding the public administration jobs should not matter that much as we still have information about public sector jobs such as nurses, doctors or teachers.

The data has been aggregated at ISCO level 3 digits level and represents occupational averages. The unit of analysis is the profession. We use aggregated data as we are not able to control for individual heterogeneity since we only have a cross-section available for 2006. Therefore, to diminish the importance of individual heterogeneity, we use aggregated data. The data retrieved occupational averages by gender and it offers a picture of European Union professions.

---

[1] Data access has been provided by EUROSTAT within its premises.

Table 1: Descriptive Statistics

	Men	Women	T test	P value
Logarithm of average wage	1.87	1.71	-25.03	0.00
Average employment in an occupation	1709	1948		
Age	31	32	7.44	0.00
ISCED 0-1	.057	.057	-2.27	0.02
ISCED 2	.140	.153	-5.94	0.00
ISCED 3-4	.479	.451	5.64	0.00
ISCED 5-6	.322	.338	-0.02	0.97
Tenure	7.02	7.39	6.07	0.00
National agreement coverage	.015	.019	-3.03	0.00
Industry agreements coverage	.209	.211	-3.27	0.00
Individual agreements coverage	.046	.046	0.92	0.35
Enterprise agreements coverage	.284	.287	-1.01	0.31
Local agreements coverage	.002	.003	-0.73	0.46
Other agreements coverage	.014	.011	2.55	0.01
No agreements coverage	.321	.316	3.46	0.00
Average Part-time	.07	.15	18.28	0.00
Average Private sector	.74	.70	6.61	0.00
Average Fixed contract	.127	.134	-1.33	0.18
Average actual Hours worked without overtime	163	159	14.57	0.00
Average actual Hours worked including overtime	166	161	16.81	0.00
Average Firm size 10-49	.266	.233	7.00	0.00
Average Firm size 50-249	.296	.288	1.97	0.04
Average Firm size 250-449	.103	.109	-2.45	0.01
Average Firm size 500-999	.097	.105	-3.44	0.00
Average Firm size >1000	.235	.264	-5.86	0.00
Average Percent women in employment	.420	.465		
N sample	889	837		

Source: occupational averages calculated from ESES 2006 data

Table 1 provides descriptive statistics of the data used in the analysis. Wages are deflated by the exchange rate and transformed into Euros. They represent average hourly wages without overtime and shift work bonuses. Overall men earn significantly more than women do and this difference is statistically significant. On average, women are one year older than men across occupations. The average employment of women in an occupation seems to be higher than the average employment of men, which could also be due to the fact that women are employed in fewer occupations compared to men. Men have a higher human capital for ISCED level 3-4 compared to women, however for ISCED level 5-6 this difference is not statistically significant. Contrary to expectations, the average tenure of women in an occupation is higher than the men's' tenure over the European Union countries investigated. There are slightly more women covered by national agreements, by industrial agreements and by other agreements.

There is no statically significant difference between men and women covered by enterprise agreements and individual agreements. On average, there are more men not covered by union agreements than women. Women tend to work more in part-time jobs than men and because the part-timers are counted in the average hours worked, women work on average fewer hours than men. When overtime is included, we see that men also tend to work more hours overtime than women. Men tend to be overrepresented in smaller firm sizes compared to women and women tend to be overrepresented in larger firm sizes. We further try to see whether these associations hold by looking at the variation by proportion female within occupations.

Table 2 provides the means of variables by gender and occupational composition. As we can see, on average, women earn less than men across occupation types except in women dominated professions when, on average, they earn more. Averages can hide important information, therefore we also provide evidence from kernel densities plots which show the distribution of wages. As seen in graph 1-4 Panel A, women have on average lower starting wages in both male and female dominated professions compared to men. Despite the fact that women have higher modal wages in mixed occupations, across the distribution more men earn higher wages compared to women in this type of professions. In female dominated professions, the difference between men and women is predominant at the tails of the distribution and not so much at the average. This means that in female dominated professions women earn a lower starting wage compared to men and they earn a lower top wage compared to men. The differences between men and women remain consistent even when bonuses for shift work and overtime bonuses are taken into account (See Panel B graph 1-4). This suggests that glass ceilings and floor effects cannot be accounted for by access to fringe benefits. Therefore, this evidence does not offer support for the hypothesis that women have lower wages which are compensated for by access to fringe benefits. However, one must note that not all the fringe benefits are present in the ESES data, but the ones that are present are valuable as very few datasets collect information about the amount of fringe benefits.

Going back to Table 2, we see that male dominated professions seem to require a lower level of educational attainment as the two highest frequencies are ISCED level of education 2 and ISCED level of education 3-4. Mixed and female dominated professions seem to require quite a high level of education, as more than 50% of men and women have ISCED level 3-4 or above. On average, women have a higher tenure than men and interestingly mixed occupations have a lower tenure compared to female and male dominated professions. There is a higher proportion of non-coverage by unions in female dominated professions and the lowest non-coverage is in male dominated professions. The pattern of union density coverage looks quite similar for men and women. Therefore, it seems that trade union power benefits more male dominated professions than female dominated ones. Across professions, women take up more part-time employment compared to men suggesting that household responsibilities are not equally shared. The incidence of part-time is higher particularly in female dominated professions and in mixed professions. Not surprisingly, male dominated professions are more in the private sector whereas female dominated ones are more in the public sector. We see however a difference between men and women as

less women work in the private sector across professions compared to men. Even for female dominated professions, around 55% of men are in the private sector compared to 48% of women. In terms of working hours, male dominated professions require more hours of work compared to mixed occupations and the lowest hours of work are in female dominated professions. Men work on average more hours and do more overtime hours compared to women across types of professions except in female professions where overtime hours is on average 2 hours for each gender.

Table 2: Means of selected variables by Gender composition

Variable	Value of proportion female				
	0-.25	.25-.50	.50-.75	.75-1.0	All
Means for women					
Logarithm of average wage	1.84	1.78	1.73	1.43	1.71
Average employment in an occupation	386	1032	2338	4734	1948
Age	32	32	32	32	32
ISCED 0-1	.097	.064	.034	.019	.057
ISCED 2	.235	.162	.109	.080	.153
ISCED 3-4	.472	.417	.386	.541	.451
ISCED 5-6	.194	.356	.469	.358	.338
Tenure	7.55	7.24	6.90	7.94	7.39
National agreement coverage	.010	.013	.023	.033	.019
Industry agreements coverage	.246	.239	.202	.138	.211
Individual agreements coverage	.066	.045	.046	.022	.046
Enterprise agreements coverage	.309	.286	.260	.292	.287
Local agreements coverage	.003	.004	.003	.002	.003
Other agreements coverage	.009	.008	.016	.012	.011
No agreements coverage	.211	.328	.358	.401	.316
Average Part-time	.110	.137	.180	.178	.15
Average Private sector	.824	.768	.679	.489	.70
Average Fixed contract	.138	.139	.139	.116	.134
Average actual Hours worked without overtime	161	159	157	156	159
Average actual Hours worked including overtime	164	161	159	158	161
Average Firm size 10-49	.192	.239	.255	.254	.233
Average Firm size 50-249	.274	.283	.295	.303	.288
Average Firm size 250-449	.129	.112	.099	.089	.109
Average Firm size 500-999	.127	.110	.093	.083	.105
Average Firm size >1000	.275	.254	.255	.269	.264
N sample	245	205	212	175	837
Means for men					
Logarithm of average wage	2.00	1.90	1.84	1.55	1.87
Average employment in an occupation	2469	1684	1330	754	1709
Age	32	32	31	31	31
ISCED 0-1	.090	.055	.037	.022	.057
ISCED 2	.203	.139	.098	.075	.140
ISCED 3-4	.542	.461	.392	.498	.479
ISCED 5-6	.163	.344	.471	.404	.322
Tenure	7.71	6.98	6.60	6.26	7.02
National agreement coverage	.004	.010	.021	.033	.015

	Value of proportion female				
Variable	**0-.25**	**.25-.50**	**.50-.75**	**.75-1.0**	**All**
Industry agreements coverage	.245	.224	.191	.141	.209
Individual agreements coverage	.058	.050	.043	.022	.046
Enterprise agreements coverage	.295	.283	.267	.288	.284
Local agreements coverage	.003	.002	.003	.001	.002
Other agreements coverage	.011	.012	.019	.014	.014
No agreements coverage	.241	.342	.363	.396	.321
Average Part-time	.033	.069	.102	.124	.07
Average Private sector	.849	.792	.695	.555	.74
Average Fixed contract	.111	.129	.132	.149	.127
Average actual Hours worked without overtime	166	163	161	158	163
Average actual Hours worked including overtime	170	166	163	160	166
Average Firm size 10-49	.274	.281	.263	.237	.266
Average Firm size 50-249	.292	.294	.3026	.300	.296
Average Firm size 250-449	.110	.107	.095	.092	.103
Average Firm size 500-999	.107	.096	.090	.092	.097
Average Firm size >1000	.214	.219	.249	.277	.235
N sample	313	205	212	159	889

Source: occupational averages calculated from ESES 2006 data

PANEL A: AVERAGE OCCUPATIONAL WAGES CENTERED AT THE COUNTRY MEAN

Graph 1. *Kernel densities for Men and Women wages in male dominated occupations*
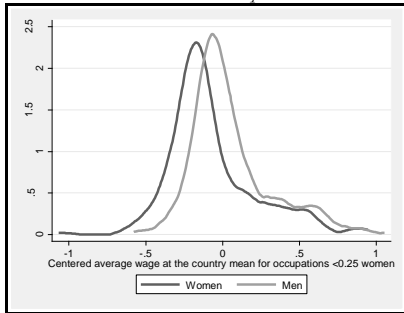
Graph 2. *Kernel densities for Men and Women wages in moderately mixed occupations*
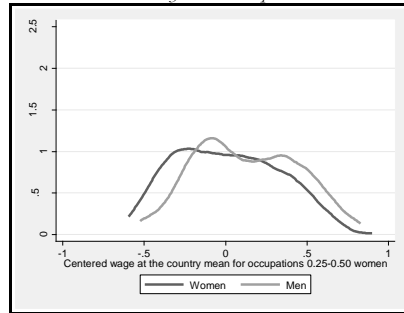
Graph 3. *Kernel densities in mixed occupations*
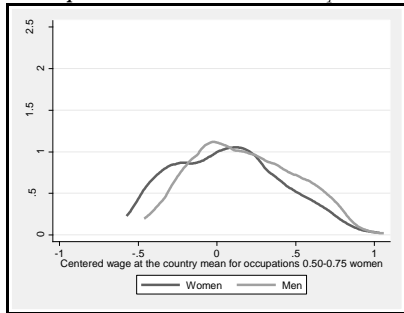
Graph 4. *Kernel densities in female dominated occupations*
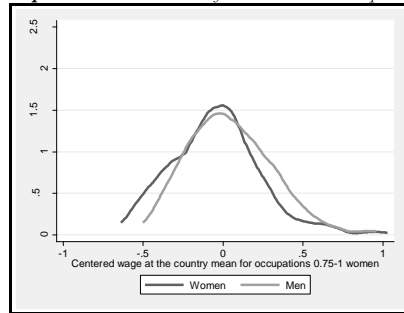
PANEL B: AVERAGE TOTAL OCCUPATIONAL WAGES INCLUDING OVERTIME AND SHIFT WORK BONUSES CENTERED AT THE COUNTRY MEAN

Graph 1. Kernel densities for Men and Women wages in male dominated occupations
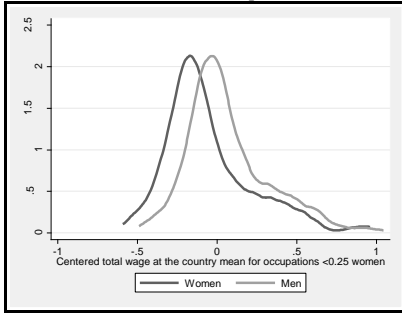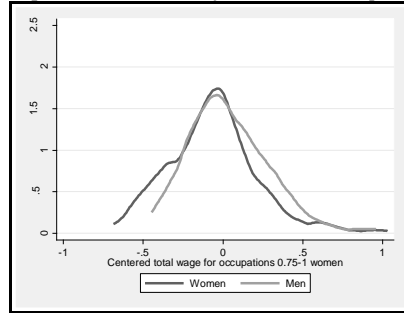

Graph 2. Kernel densities for Men and Women wages in moderately mixed occupations
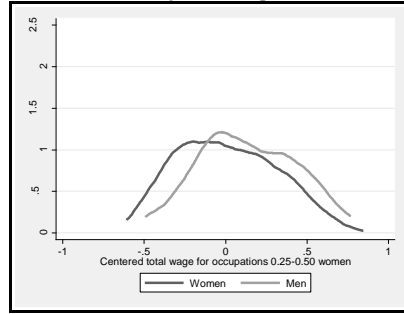
Graph 3. Kernel densities in mixed occupations
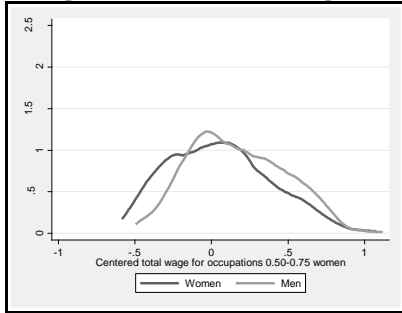
Graph 4. Kernel densities in female dominated occupations

Estimation Results

We have three wage measures: female occupational average wages, male occupational average wages and the occupational gender pay gap which is a logarithmic ratio of female wages divided by male wages.

Table 3F presents the estimates for the female wages and 3M for the male wages. The quadratic patterns are depicted in Panel C. In the models in which we do not control for occupational or individual characteristics, wages for males and females are highest in mixed occupations, with men earning more than women (See Panel C Graph 1 and 1, Panel E Graph 9 and 10). The question this results leads to is whether the characteristics of these occupations or the act that employ both men and women explain the higher wages. To disentangle effects of characteristics of the occupation and the fraction women we include occupational dummies to the specification. The non-linear relationship between percentage of female and male occupational wages becomes inverted (See Panel C Graph 1 and Graph 2), with mixed occupations having lower wages for men, and female occupations having lower wages for women (See table 3F and 3M). This therefore implies that indeed the character of the occupation and not the gender ratio accounted for these high wages. A potential explanation is that

occupations that require a lot of education can be occupied by both men and women because these skills acquired at school are less gender specific. When occupational dummies are added as controls, we see that female wages are lower than male wages across the distribution, the gender pay gap being larger in female occupations. There can be several explanations for these differences. First, part of these differences could be caused by human capital investment differences between men and women. We measure human capital as educational investment and experience, proxied by age and tenure. When we control for human capital investment, the effect of proportion female on female and male wages becomes rather similar in magnitude (Table 3F and Table 3M Model 2), however differences between men and women are quite wide for female dominated occupations (Panel C Graph 2 and 3). Controlling for human capital, men earn less than in male dominated occupations but significantly more than in mixed occupations (Panel C Graph 3). Controlling for human capital, women earn less than women working in mixed or male dominated occupations (Panel C Graph 3). A second explanation is part-time work. When we control for the percent of women in part-time work and the percent of men in part-time work, we see that the penalty for the feminization of an occupation becomes larger for women and slightly larger for men suggesting that part time is well paid (Table 3F and 3M Model 3). Controlling for part-time, women's returns in male occupations seem to be higher than those of men, but the opposite is true for female dominated professions (Panel C Graph 4). A third explanation could be trade unions. When we control for the percent of women covered by bargaining agreements we see that trade union coverage increases the returns for occupations across the distribution, and particularly women in female occupations seem to be earning more now than in mixed occupations (Panel C Graph 5). Adding bargaining controls for men also shifts the returns across occupational types up, suggesting that men covered also earn more (Panel C Graph 5). The bargaining institutions manage to make the differences between men and women working in female occupations smaller in magnitude compared to models which did not include these variables. Once we control for union coverage for both men and women, mixed occupations are the ones with lower returns and the gender pay gap seems to be larger for male or female occupations (Panel C Graph 5). Controlling for the characteristics women earn relatively more in male occupations and men earn relatively more in female occupations. Since the fraction of women in an occupation is on average below 0.5, this still leads to higher wages for men compared to women on average.
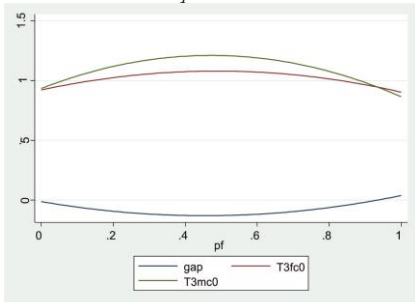
Table 3F: The effect of proportion female on female wages controlling for country and occupational dummies

	Basic women wages				
	Model 1	Model 2	Model 3	Model 4	Model 5
Percentage women	-0.339	-0.438**	-0.687***	-0.693***	-0.710***
Sd. Err	(0.217)	(0.211)	(0.221)	(0.214)	(0.211)
Percentage women square	0.100	0.251	0.406**	0.474***	0.541***
Sd. Err	(0.169)	(0.164)	(0.168)	(0.163)	(0.161)
Country dummies	YES	YES	YES	YES	YES
Occupation dummies	YES	YES	YES	YES	YES
Human capital variables		YES	YES	YES	YES

|	Basic women wages				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Part-time dummy			YES	YES	YES
Union density dummies				YES	YES
Occupation size					YES
R square	0.980	0.982	0.982	0.984	0.984
N	771	771	771	771	771
EU 25 Women Labor Force Participation	57.6	57.6	57.6	57.6	57.6

Notes: Reference categories are: Czech Republic, computer professionals, ISCED 5-6 level of
education, not covered by bargaining agreements. Human capital variables include: age -
40-tenure, tenure, ISCED 0-1, ISCED 2, ISCED 3-4 educational categories. Bargaining
coverage includes: national, industry, enterprise, local, individual and other agreements.
Occupational dummies are defined at ISCO 3 digits level and per country are 87
occupations observed, completely male and female dominated occupations are excluded.
Regressions are weighted by the number of working women in that occupation.

Table 3M: The effect of proportion female on female wages controlling for country
and occupational dummies

	Basic male wages				
	Model 1	Model 2	Model 3	Model 4	Model 5
Percentage women	-0.602***	-0.586***	-0.630***	-0.616***	-0.608***
Sd. Err	(0.121)	(0.115)	(0.116)	(0.115)	(0.115)
Percentage women square	0.477***	0.512***	0.556***	0.552***	0.539***
Sd. Err	(0.128)	(0.121)	(0.123)	(0.121)	(0.121)
Country dummies	YES	YES	YES	YES	YES
Occupation dummies	YES	YES	YES	YES	YES
Human capital variables		YES	YES	YES	YES
Part-time dummy			YES	YES	YES
Union density dummies				YES	YES
Occupation size					YES
R square	0.987	0.989	0.989	0.989	0.989
N	771	771	771	771	771
EU 25 Male Labor Force Participation	72.1	72.1	72.1	72.1	72.1

Notes: Reference categories are: Czech Republic, computer professionals, ISCED 5-6 level of
education, not covered by bargaining agreements. Human capital variables include: age -
40-tenure, tenure, ISCED 0-1, ISCED 2, ISCED 3-4 educational categories. Bargaining
coverage includes: national, industry, enterprise, local, individual and other agreements.
Occupational dummies are defined at ISCO 3 digits level and per country are 87
occupations observed, completely male and female dominated occupations are excluded.
Regressions are weighted by the number of working men in that occupation.

PANEL C. THE EFFECT OF OCCUPATIONAL SEGREGATION ON MALE DOMINATED, MIXED AND FEMALE DOMINATED PROFESSIONS UNDER DIFFERENT SPECIFICATIONS
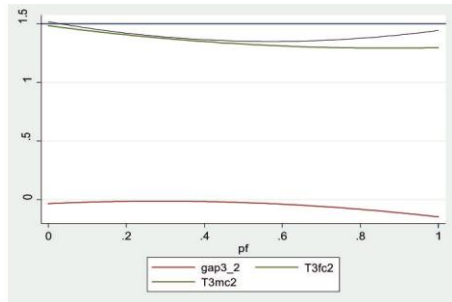
Graph 1. The effect of proportion female on female wages, male wages and gender pay gap without occupational controls
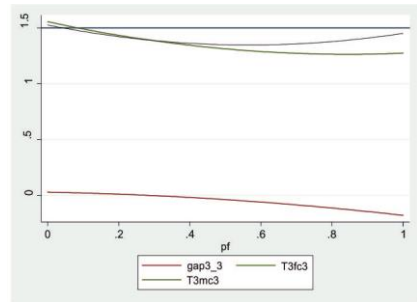

Graph 2. The effect of proportion female on female wages, male wages and gender pay gap with occupational controls
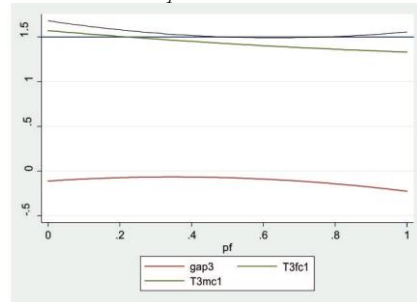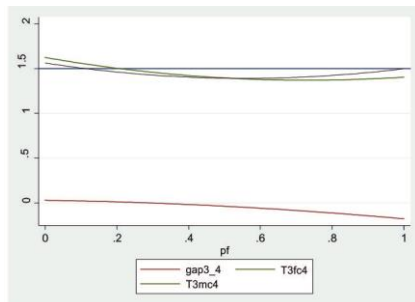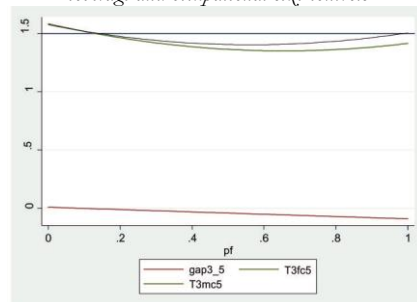

Graph 3. The effect of proportion female on female wages, male wages and gender pay gap with occupational and human capital controls

Graph 4. The effect of proportion female on female wages, male wages and gender pay gap with occupational and human capital and part-time controls

Graph 5. The effect of proportion female on female wages, male wages and gender pay gap with occupational, human capital, part-time and bargaining coverage controls

Graph 6. The effect of proportion female on female wages, male wages and gender pay gap with occupational, human capital, part-time, bargaining coverage and occupational size controls

In Panels D and E we present the relationship between the percentage females and the wages of men and women varying the order in which controls are included. This provides support for the hypothesis that the high wages for mixed occupations is due to high investments in education there. If occupational dummies are not included then the strong positive effect of mixed occupations on wages disappears once we control for education.

PANEL D. THE EFFECT OF ADDING VARIABLES ON FEMALE AND MALE WAGES CONTROLLING FOR OCCUPATION AND COUNTRY EFFECTS

Graph 7. The effect of proportion female on female wages with occupational, human capital, part-time, bargaining coverage and occupational size controls

Graph 8. The effect of proportion female on male wages with occupational, human capital, part-time, bargaining coverage and occupational size controls
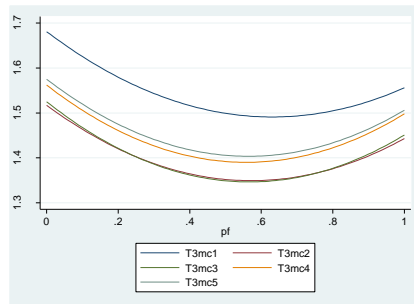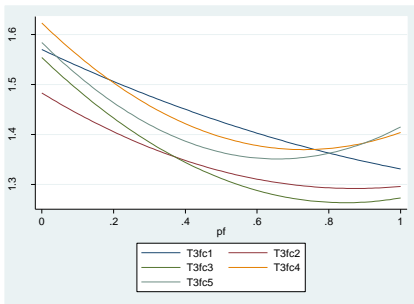
PANEL E. THE EFFECT OF ADDING VARIABLES ON FEMALE AND MALE WAGES CONTROLLING ONLY FOR COUNTRY EFFECTS WITHOUT OCCUPATIONAL DUMMIES CONTROLS

Graph 9. The effect of proportion female on female wages with all other controls except occupational dummies

Graph 10. The effect of proportion female on male wages with all other controls except occupational dummies
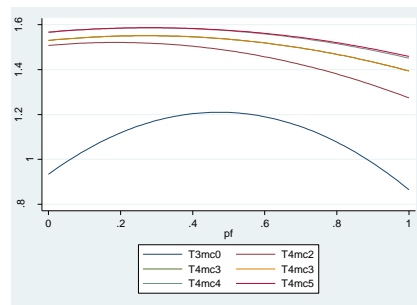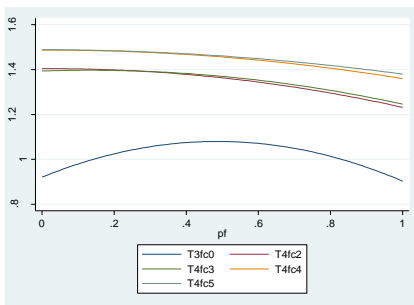

Table 4 provides estimates for the relationship between the gender wage gap and the fraction women in an occupation. Panel F shows the patterns graphically. It shows that the gender pay gap depends substantially on the fraction of women in a job. When few controls are added, women earn less in all occupations, but this difference is larger in female

occupations. When human capital variables are added, the effect of occupational segregation becomes even larger on the gender pay gap. The more controls are added, the smaller the average gender wage gap, with, in the end, a smaller gender wage gap (women earn slightly less than men) in male occupations and a larger gender wage gap in female occupations.

Table 4: The effect of proportion female on gender pay gap ratio controlling for country and occupational dummies

	Gap basic wages				
	Model 1	Model 3	Model 4	Model 5	Model 6
Percentage women	-0.228***	-0.234***	-0.249***	-0.210**	-0.205**
Sd. Err	(0.080)	(0.082)	(0.083)	(0.084)	(0.084)
Percentage women square	0.133*	0.123*	0.132*	0.099	0.102
Sd. Err	(0.071)	(0.073)	(0.074)	(0.075)	(0.075)
Country dummies	YES	YES	YES	YES	YES
Occupation dummies	YES	YES	YES	YES	YES
Human capital variables		YES	YES	YES	YES
Part-time dummy			YES	YES	YES
Union density dummies				YES	YES
Occupation size					YES
R square	0.651	0.682	0.684	0.698	0.698
N	771	771	771	771	771

Note: Reference categories are: Czech Republic, computer professionals, ISCED 5-6 level of education, not covered by bargaining agreements. Human capital variables include: age ratio women to men, age ratio women to men squared, tenure ratio women to men, ISCED 0-1, ISCED 2, ISCED 3-4 educational categories for each gender. Bargaining coverage includes: national, industry, enterprise, local, individual and other agreements for each gender. Occupation size includes the number of women employed in that occupation out of the total women working in the sample, and the number of men employed in that occupation out of the total men working in the sample. Occupational dummies are defined at ISCO 3 digits level and per country are 87 occupations observed. Regressions are weighted by the number of working individuals in that occupation.

PANEL F. THE EFFECT OF ADDING VARIABLES ON THE GENDER PAY GAP CONTROLLING FOR COUNTRY EFFECTS AND OCCUPATIONAL DUMMIES CONTROLS

Graph 9. The effect of proportion female on gender pay gap with all other controls
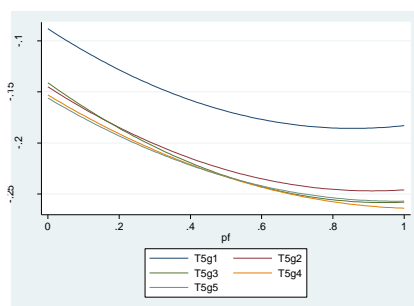
Concluding remarks

The aim of this paper was to investigate whether the fraction of women in a job has an impact on male and female wages in occupations are therefore if it can account for the gender pay gap. Previous papers suggested that both men and women earn less in female occupations. These studies, however, assumed this relationship to be linear and could account for differences between occupation only by controlling for detailed occupational characteristics. The measurement of these characteristics is limited and shifts the discussion further to the questions whether characteristics for female occupations are paid relatively low. By using data for different countries we are able to estimate the relationship between the fraction of women and wages, including occupational dummies. In that way we are able to estimate the pure effect of the fraction of women in an occupation. By including a quadratic specification we account for potential non-linearities.

We use the European Structure of Earnings data for 2006 to retrieve occupational wages at a detailed three digits level and we use the grouped data in a weighted least square estimation. We assume that the relative position of occupational wages in the occupational structure is the same across European countries and that being employed in a certain occupation implies the same tasks in each country. Based on this assumptions we are able to identify the effect of the proportion female on female and male occupational wages exploring the cross-country variation.

Our results show that the relationship between the proportion of female in an occupation and occupational average wages for men and women is non-linear. Most of the literature emphasizes a negative effect of the composition of wages on male and female wages. However, Perales (2010) finds also a non-linear relationship using the British Household Panel Survey augmented with Labour Force Survey and 2006 Skills Survey. His estimations show an inverted U relationship similar to the one we find when we do not control for occupational characteristics. When we fully control for all occupational characteristics by adding occupational dummies, we show that there is a U relationship between occupational segregation and occupational wages. This finding is new in the literature. Magnusson using Swedish register data (2013) also finds a non-linear relationship between the percent female in an occupation and wages. She finds the highest wages are earned for both men and women in integrated mixed occupations.

Further, our results show that – controlling for occupational characteristics – for men the relationship between the fraction of women and wages is U-shaped. Men earn relatively high wages in occupations with either very few or many women. Women follow a similar pattern, but with a slightly downward trend added to this when moving to the female occupations. Adding controls with characteristics like part-time work, education and union coverage, removes this downward trend and leads to U-shaped patterns for both men and women, with men earning relatively high wages in the female occupations and women earning relatively high wages in male occupations. Further research is needed into the shape of the relationship; future research should use panel data at the individual level for several countries with more variables as controls. Given our survey data and research design the current article is limited in its scope.

References

Angrist, J. D., & Pischke, J. S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.

Arrow, K. J. (1973).The theory of discrimination. In: Ashenfelter, O., & Rees, A. (Eds.), Discrimination in labour markets (pp. 3-33), Princeton, N.J.: Princeton University Press.

Altonji, J., & Blank, R. (1999). Race and Gender in the labour market. In: Ashenfelter, O., & Card, D. (Eds.), Handbook of Labor Economics, Vol. 3, Part C (pp. 3143-3259), Elsevier.

Baker, M., & Cornelson, K. (2018). Gender-based occupational segregation and sex differences in sensory, motor, and spatial aptitudes. Demography, 55(5), 1749-1775.

Baker, M., & Fortin, N. M. (2001). Occupational gender composition and wages in Canada, 1987–1988. Canadian Journal of Economics/Revue canadienne d'économique, 34(2), 345-376.

Becker, G. S. (1957). The economics of discrimination, Chicago, IL: University of Chicago Press.

Bergmann, B. R. (1974). Occupational segregation, wages and profits when employers discriminate by race or sex. *Eastern Economic Journal*, 1(2), 103-110.

Bettio, F., Verashchagina, A., Mairhuber, I., & Kanjuo-Mrčela, A. (2009). Gender segregation in the labour market: Root causes, implications and policy responses in the EU. Luxembourg: Publications Office of the European Union (pp. 90-94).

Blinder, A. S. (1973). Wage discrimination: reduced form and structural estimates. Journal of Human Resources, 8(4), 436-455.

Blau, F. D., & Ferber, M. A. (1991). Career plans and expectations of young women and men: The earnings gap and labor force participation. Journal of Human Resources, 26(4), 581-607.

Blau, F., & Kahn, L. M. (2017). The Gender Wage Gap: Extent, Trends, and Explanations. Journal of Economic Literature, 55(3), 789-865.

Blau, F. D., & Kahn, L. M. (1996). International differences in male wage inequality: institutions versus market forces. Journal of Political Economy, 104(4), 791-837.

Blau, F., & Kahn, L. M. (2003). Understanding International Differences in the Gender Pay Gap. Journal of Labor Economics, 21(1), 106-144.

Boeri, T., & Van Ours, J. (2013). The economics of imperfect labour markets. Second Edition. Priceton University Press.

Boll, C., & Lagemann, A. (2018). Gender pay gap in EU countries based on SES (2014). Luxembourg, Publication Office of the European Union.

Brynin, M., & Perales, F. (2016). Gender wage inequality: The de-gendering of the occupational structure. European Sociological Review, 32(1), 162-174.

Burchell, B., Hardy, V., Rubery, J., & Smith, M. (2014). "A New Method to Understand Occupational Gender Segregation in European Labour Markets". European Commission, Luxembourg, 2014, available at: http://ec.europa.eu/justice/gender-equality/files/documents/150119_segregation_report_web_en.pdf

Card, D., Lemieux, T., & Riddell, W. C. (2020). Unions and wage inequality: The roles of gender, skill and public sector employment. *Canadian Journal of Economics/Revue canadienne d'économique*, 53(1), 140-173.

Council of the European Union, "Gender segregation in education, training and the labour market Review of the implementation of the Beijing Platform for Action in the EU Member States", Report prepared by European Institute for Gender Equality (EIGE) at the request of the Estonian Presidency, 2017, http://data.consilium.europa.eu/doc/document/ST-14624-2017-ADD-2/en/pdf

Corcoran, M., Duncan, G. J., & Ponza, M. (1984). Work Experience, Job Segregation, and Wages. In: Reskin, B. F. (Ed.): Sex Segregation in the Workplace: Trends, Explanations, Remedies (pp. 171-179).Washington, D.C.: National Academy Press.

Cotter, D. A., Hermsen, J. M., & Vanneman, R. (2004). *Gender inequality at work*. New York: Russell Sage Foundation.

Dupuy, A, Fourage, D., & Buligescu, B. (2009). Development of econometric methods to evaluate the Gender Pay Gap using the European Structure of Earnings Data. Eurostat methodologies and Working papers, Luxembourg Office for Official Publications of the European Communities.

England, P. (1982). The failure of human capital theory to explain occupational sex segregation. *Journal of Human Resources*, 18, 358-370.

England, P. (1992). *Comparable Worth. Theories and Evidence*. New York, NY: Aldine de Gruyter.

European Institute for Gender Equality (EIGE) (2017). Gender segregation in education, training and the labour market. Review of the implementation of the Beijing Platform for Action in the EU Member States. Available at URL: https://data.consilium.europa.eu/doc/document/ST-14624-2017-ADD-2/en/pdf

Freeman, R. B., & Oostendorp, R. (2000). Wages around the world: pay across occupations and countries (No. w8058). National Bureau of Economic Research.

Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review*, 104(4), 1091-1119.

Goldin, C., Kerr, S. P., Olivetti, C., & Barth, E. (2017). The expanding gender earnings gap: Evidence from the LEHD-2000 Census. *American Economic Review*, 107(5), 110-14.

Gorlich, D., & de Grip, A. (2009). Human capital depreciation during family-related career interruptions in male and female occupations. *Oxford Economic Papers*, 61, i98-i121.

Gupta, N. D. (1993). Probabilities of job choice and employer selection and male-female occupational differences. The American Economic Review, 83(2), 57-61.

Hook, J. L., & Pettit, B. (2008). *Reproducing occupational inequality: Marriage, parenthood and the gender divide in occupations* (No. 481). LIS Working Paper Series.

ILO (2004). World Employment and Social Outlook 2004.

ILO (2018). World Employment and Social Outlook – Trends 2018.

Kim, M. K., & Polachek, S. W. (1994). Panel estimates of male-female earnings functions. Journal of Human Resources, 29(2), 406-428.

Kunze, A. (2000). The Determination of Wages and the Gender Wage Gap: A Survey. *IZA DP*, 193, 1-67.

Kunze, A. (2008). Gender wage gap studies: consistency and decomposition. *Empirical Economics*, 35(1), 63-76.

Levanon, A., & Grusky, D. B. (2016). The persistence of extreme gender segregation in the twenty-first century. *American Journal of Sociology*, 122(2), 573-619.

Magnusson, C. (2013). More women, lower pay? Occupational sex composition, wages and wage growth. *Acta Sociologica*, 56(3), 227-245.

Macpherson, D. A., & Hirsch, B. T. (1995). Wages and gender composition: why do women's jobs pay less?. *Journal of Labor Economics*, 13(3), 426-471.

Neumark, D., Bayard K., Hellerstein J. K., & Troske, K. R. (2004). New evidence on sex segregation and sex differences in ages from matched employer-employee data. In: Newmark, D. (Ed.), *Sex differences in labor markets* (pp. 299-332). Routlege Research in Gender and Society, Routledge.

Oostendorp, R., (2004). *Globalization and the gender wage gap.* Amsterdam Institute for Development, Mimeo.

Perales, F., (2010). Occupational feminization, Specialized Human Capital and Wages: Evidence from the British Labour Market. *ISER Working Paper Series*, No. 2010-31, 1-49.

Perales, F. (2013). Occupational sex-segregation, specialized human capital and wages: evidence from Britain. *Work, Employment and Society*, 27(4), 600-620.

Plasman, R., & Sissoko, S. (2004). Comparing apples with oranges: Revisiting the gender wage gap in an international perspective. Available at SSRN: https://ssrn.com/abstract=644322

Phelps, E. S. (1972). The statistical theory of racism and sexism. *The American Economic Review*, 62(4), 659-661.

Polachek, S. W. (1981). Occupational self-selection: A human capital approach to sex differences in occupational structure. The review of Economics and Statistics, 63(1), 60-69.

Rosen, S. (1974). Hedonic prices and implicit markets: product differentiation in pure competition. *Journal of Political Economy*, 82(1), 34-55.

Schmitt, J., & Lane, N. (2009). *An international comparison of small business employment*. Washington, DC: Center for Economic and Policy Research.

Solberg, E., & Laughlin, T. (1995). The gender pay gap, fringe benefits, and occupational crowding. *ILR Review*, 48(4), 692-708.

Sorensen, E. (1990). The crowding hypothesis and comparable worth. Journal of Human Resources, 25(1), 55-89.

Strawinski, P., Majchrowska, A., & Broniatowska, P. (2018). Occupational segregation and wage differences: the case of Poland. *International Journal of Manpower*, 39(3), 378-397.

Appendix

Table A1: Duncan and Duncan (1955) Index of dissimilarity measuring occupational segregation

	1997 (occupational)	2007 (occupational)	1997 (sectoral)	2007 (sectoral)
Austria	56.4	52.8	40.5	37
Belgium	55	52.2	37.2	37.7
Bulgaria	n.a	58.9	n.a	41.7
Cyprus	n.a	58.4	n.a	40.7
Czech Republic	60.8	58	38.6	40.1
Germany	56	53.8	36.4	37
Denmark	56.3	51.7	39.1	37.9
Estonia	61.8	64.3	43.5	52.2
Greece	45.3	47.2	32	33.4
Spain	52.5	56.7	41.6	42.8
Finland	59.9	59.2	44	46
France	55.4	53.6	35	36.8
Hungary	56.4	58.1	37.9	40.5
Ireland	52.4	57	41.8	47.6
Island	58.3	55.4	44.2	46.3
Italy	46.6	49.4	32.2	37.2
Lithuania	57.4	58.4	37.7	46.8
Luxembourg	53.7	54.9	40.6	38.7
Latvia	53.9	60.3	33.2	47
Malta	n.a.	53.5	n.a	33.9
Netherlands	53.1	50.8	39.6	37.9
Norway	59.3	54.5	44.1	45.6
Poland	49.8	52.2	n.a.	38.9
Portugal	50.2	53.3	40.8	41.4
Romania	43.1	46.8	29.4	32.4
Sweden	59.7	54.1	43.8	42.7
Slovenia	54.7	53.6	35.8	35
Slovakia	63	61.4	42.9	47
UK	55.3	50.9	38.4	37.5
EU-27	n.a.	50.99	n.a.	37.2

Source: Bettio & Verashchagina (2009)

Notes: The Duncan Segregation index is an example of an index of dissimilarity and is calculated using the following formula:

$$ID = \frac{1}{2} \sum_{i=1}^{N} \left| \frac{mi}{M} - \frac{fi}{F} \right|$$

where:

mi = the male population of the ith occupation

M = the total male population of the country or labor force of interest.

fi = the female population of the ith occupation

F = the total female population of the country or labor force of interest.

It is interpreted as "the percentage of females who would have to change jobs for the occupational distribution of women and men to be the same with a value of 0 indicating no segregation and a value of 100 indicating complete segregation" (Blau and Kahn, 2017).

Graph A1. *Histogram of the proportion of women by country and overall sample*

Graphs by Country
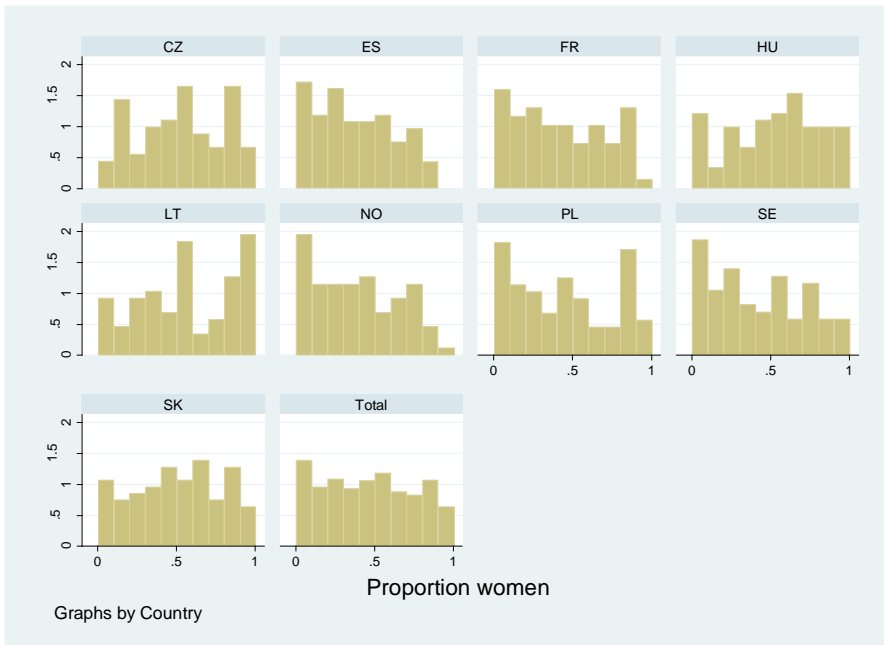
Proportion women

Note: The graph depicts the proportion of women variability between 0.01 and 1. Occupations with zero proportion of women (male dominated occupations) have been excluded (44 occupations).

BOOK REVIEW
Bonea, G.V.: VIOLENȚA BAZATĂ PE GEN: ABORDĂRI TEORETICE ESENȚIALE,
Editura Sigma Educational, Bucharest, 2020, p. 191

Vlad I. ROȘCA[1]

Odd enough, the revised book has been published in the "*Contemporary Dilemmas*" collection of the Sigma Educational Publishing House, Bucharest, in 2020, during unprecedented times of a global pandemic, through which the World Health Organization (WHO) and the United Nations (UN) have issued repeated warnings about an increased risk of gender based violence due to the "anthropause" phenomenon and the drastically – and forcefully – modified human behaviors. A worldwide increase of incidents of violence against women has been reported since the severe anti-Covid-19 lockdown measures have first been implemented in early spring 2020, and continued throughout most of the rest of the year (see Menegatti et al., 2020; Ornell et al., 2020; Vora et al., 2020).

What else, then, if not a more than topical contemporary dilemma is gender based violence in times when people are exposed to such drastic changes of behavior and attitudes brought along by the Covid-19 crisis? The book is obviously a result of long-lasting research efforts, but as coincidence has it, it saw the print in a year 2020 that makes the title and subject become even more alluring for professionals such as sociologists, social workers, psychologists etc., but not only. As we find out from the inscription, "*Gender Based Violence: Essential Theoretical Approaches*" (in original: *Violența bazată pe gen: abordări teoretice esențiale*) is a book dedicated to all those who consider gender based violence an affection that harms not only the society, but also the individual, both aggressor and aggressee. Georgiana-Virginia Bonea, researcher at the Research Institute for the Quality of Life (ICCV) next to the National Institute for Economic Research "Costin C. Kiritescu" of the Romanian Academy, dully respects the promise throughout the book, maintaining a line of presentation that allows the reader to understand the content either from a social or an individual perspective. Sociology and psychology intertwine to pinpoint gender based violence.

---

[1] Lecturer, The Bucharest University of Economic Studies, 6 Piata Romana, Bucharest, Romania.
  E-mail: vlad_rsc@yahoo.com

The first part of the book (pp. 20-105) is dedicated to the theoretical aspects concerning gender based aggressivity and violence. Different types of gender based violence are dedicated separate sub-chapters (family violence, community violence, racial violence, state violence, discrimination, cultural violence, economic abuse, trafficking etc.), being then backed up by theories that can explain why such kinds of violence occur (patriarchal theories, feminist theories, social learning theory etc.).

The second part (pp. 106-119) is dedicated to the social policies existing around gender based violence. Such policies are undoubtedly attributed with an important role towards combatting violence. The focus then draws to the efforts made by Romania in combatting gender based violence, yet the author warns that, although looking at social policies abroad might be helpful, these should not be simply replicated within the national context, but adapted to the socio-cultural specifics of Romania (p. 107). Thereupon, the use of a comparative research design for this second part seems more than appropriate: Romania in chapter II.2. versus the rest of the world in chapter II.3., with concluding remarks following shortly thereafter.

The third part continues the comparative analysis, this time between Romania and the European Union, using statistical data from various Eurobarometers and choosing a feminist design in order to highlight some trends of gender based violence in Romania (pp. 120-139). The fourth and final part of the book (save the Conclusions) deals with the perceptions around the image of the woman and the image of the man in the contemporary society, highlighting that the roles within couples or families have changed once mentalities have changed as well.

To round up, the current Covid-19 crisis might itself accelerate some alterations in human mentalities, which, at their turn, can possibly effect on the roles of men and women in society and, subsequently, might also lead to particularities or peculiarities in gender based violence. A *contemporary dilemma* more than ever…

References

Menegatti, M. S., Fornari, L. F., dos Santos, D. L. A., Lourenço, R. G., & da Fonseca, R. M. G. S. (2020). Retratos da violência doméstica de gênero na pandemia da COVID-19. *Comunicação & Inovação*, 21(47).

Ornell, F., Halpern, S. C., Dalbosco, C., Sordi, A. O., Stock, B. S., Kessler, F., & Telles, L. B. (2020). Domestic violence and drug use during the COVID-19 pandemic. *Pensando Familias*, 24(1), 3-11.

Vora, M., Malathesh, B. C., Das, S., Chatterjee, S. S. (2020). COVID-19 and domestic violence against women. *Asian Journal of Psychiatry*, 53, 102227.

JCPP