During the long process of modernization in the Greek countryside, the introduction of four quasi-urbanizing technologies (electricity, telephone, radio, automobile) was propagated at time-points of bending or changing material conditions. Subject and scope of technology applications were the peasant communities and the residents of suburban centers, which produce the conditions within the immanent landscape of land. The innovative appearances of technology in rural countryside were implemented through human action, which intervenes in the status-quo of spatial reality. Innovation scans everyday circumstances and dissolves them, regardless the Unity of the Community of the village, which cannot any time assimilate technology.

Vasileios Evangelidis

Vasileios Evangelidis was born on 27th December 1969 in Thessaloniki, Greece. In 2008, he completed his Master in History and Philosophy of Science and Technology (dissertation on the History of the Greek Railways). Subsequently, in 2012, he obtained his Ph.D. in the History of Electrification in Rural Greece.

978-3-659-53216-0

Technology and Community Life in Greece

Evangelidis

Vasileios Evangelidis

Sparkling, Plowing and Urbanizing

LAP LAMBERT Academic Publishing

Vasileios Evangelidis

Sparkling, Plowing and Urbanizing

Vasileios Evangelidis

Sparkling, Plowing and Urbanizing

LAP LAMBERT Academic Publishing

Impressum / Imprint
Bibliografische Information der Deutschen Nationalbibliothek: Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.d-nb.de abrufbar.

Bibliographic information published by the Deutsche Nationalbibliothek: The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

Coverbild / Cover image: www.ingimage.com

Verlag / Publisher:
LAP LAMBERT Academic Publishing
ist ein Imprint der / is a trademark of
OmniScriptum GmbH & Co. KG
Heinrich-Böcking-Str. 6-8, 66121 Saarbrücken, Deutschland / Germany
Email: info@lap-publishing.com

Herstellung: siehe letzte Seite /
Printed at: see last page
ISBN: 978-3-659-53216-0

Sparkling, Plowing and Urbanizing

Evangelidis Vasileios

Contents

Acknowledgements:

I would like to thank people who helped me in my research, offered comments on the text, and through discussion clarified my ideas. This research was supported by the Programme for the History of Science and Technology, at the National Technical University of Athens and the University of Athens, and by the Historical Archives of the Public Power Corporation of Greece.

Introduction

This book presents a history of mechanization and electrification from the viewpoint of the periphery, that is, from the aspects of the agrarian countryside, the South-Eastern Europe, the developing countries, etc., focusing on agrarian communities in Greece. It is also a comparative research on the respective changes between centre and periphery, through their interaction with modernity, technology and market, in the face of crises and business cycles.

With this inquiry, we aim to discuss popular conceptions of civilization and technical progress, e.g. lighting, communications, mechanization etc.; to research the available resources for an appraisal of the penetration of modern technology into countryside. We also intend to criticize the presumed transition from a closed or semi-closed economy to the commercialization and the shaping of an internal market; this critique focuses on historical thresholds, such as the after-war conflicts and transformations.

Actually, a complete approach to such questions should also include a study of: a) the commercial and maritime exchanges, b) the agrarian nexus to mechanization and industrialization, i.e. *mechanical engineering industry*, c) the energy-production transformation, d) the centre-periphery contradiction, and e) the proposed answers to economic depression. Thus, it may also involve a comparative research on the respective changes and mutual influences between centers and peripheries.

On account of this, agrarian or peripheral societies should not be viewed as marginal communities. By contrast, the rural communities must be considered as fountains and immanent loci of the productive processes,[1] at least until the higher development of engineering. The peripheral societies also presuppose curves, movements, exchanges and communication. Therefore, it would be interesting to examine the cross-section points between the rural and the peripheral, from antiquity to the present.

1. *Prolonged productive continuities versus militaristic ruptures*

Technology may be defined as the 'tool-making' ability, which characterizes humans and intelligent apes.[2] Since prehistoric times, technical skills were used mainly for collective work. But if the agrarian and urban communities were the organizations facilitating the productive activities of their members, the wars were destroying this cyclical procedure.

Regardless the differences in access to technology between peace and wartime, this was particularly seldom and true in the case of Greek populations, which were well acquainted with Asiatic despotism,[3] rural community and urban civil war. Nevertheless, cities, such as Troy, markets and state formation were critical frameworks for the interaction between technologies and agrarian

[1] Žmolek, Michael Andrew. 2013. *Rethinking the Industrial Revolution. Five Centuries of Transition from Agrarian to Industrial Capitalism in England*. Leiden: Brill.
[2] Nye D.E. *Technology Matters, Questions to live with.* Cambridge, Massachusetts: The MIT Press, 2006.
[3] Milios, J. "Asiatic Mode of Production". In: *Encyclopedia of Political Economy*, edited by Phillip Anthony O'Hara, Routledge Publishers, London 1999, pp. 18-20.

communities. An insightful, thus, retrospective view to the power-antagonisms from the antiquity and the Middle Ages, until the eve of the modern laborious era, is helpful to understand the historical roots of our topic, with the great transformation achieved.

A successful historical explanation should also contain the analysis of the centre-periphery historical tension, appearing together with humanism, e.g. the explanation of the transition from the city-centred economies to the emergence of the capitalism. Thus, in the precapitalistic social formations, the primal distinctive marks of the Pursuit of Power were the division between *worker* and *warrior,* the significance of the dispersed copper and tin ores and ingots, furthermore, the importance of long distance trade and 'organized robbery', the introduction of taxes, rents and administrative systems for military victuals.[4]

Like failures of agrarian communities to innovate production, so state formation was not always merging commercial and military spirit. Critical improvements, such as the spoked wheel, chariots and wheelwrights, archery and bowmakers, facilitated the barbarian conquests between 1800 and 1500 B.C. Chariot warriors' élites formed aristocratic, feudal societies, which remained stable until the introduction of iron, around 1200 B.C.

Not only iron weaponry but also iron plowshares, made realistic a widespread diffusion of cheap metal applications. After the invention of the stirrups (fifth-sixth centuries A.D.), feudal reorganization was introduced in the West, with Charles Martel's new style of cavalry, in

[4] McNeill. *The Pursuit of Power. Technology, Armed Force, and Society since A.D. 1000.* The University of Chicago Press. 1982.

A.D. 732; whereas in the Byzantine East only after A.D. 900. Meanwhile, the rise and dissemination of Islam proves, according to McNeill,[5] the influential impetus of *ideas*, with their preference to urban, mercantile and bureaucratic principles, against the feudal ones.

Moreover, commercialization, finance and markets are related to China's technological (iron, steel, coal, navy, etc.) and economic predominance between A.D. 1000 and 1500. Iron was used to make currency, arsenal, armour, and other unknown commodities. In 1083, the Government, decided "to monopolize the sale of agricultural implements made of iron";[6] the relation, however, between Chinese bureaucracy, Mongolian (Yüan) dynasty, market and society has been analyzed by various different approaches.[7]

During the Sung period, while transiting from the long period of the crossbow to the new era of the gunpowder, the Chinese army numbered one million soldiers. "The city-based, defensive character of Sung strategy", as McNeill[8] stressed, "encouraged technical experiment". The compass and printing technologies, well before the gunpowder, had intensified the commercialization. The Yüan dynasty cooperated with the merchants as no other ruler of China did.

---

[5] McNeill. *The Pursuit of Power. Technology, Armed Force, and Society since A.D. 1000*. The University of Chicago Press. 1982.

[6] *The Pursuit of Power. Technology, Armed Force, and Society since A.D. 1000.* The University of Chicago Press. 1982, p. 27; Hartwell, R. M. Demographic, Political, and Social Transformations of China, 750-1550. *Harvard Journal of Asiatic Studies*, 42 (2), 1982, pp. 365-442.

[7] McNeill, Ibid.; Schirokauer, C. (1965). Balazs on China. *Journal of the History of Ideas,* 26 (4): 593-597. Grimm, T. (1967). Tradition und Revolution in China. Überlegungen zur Konsistenz asiatischer Traditionen. *Historische Zeitschrift*, 204 (1): 79-103; Lien-Sheng Yang (1970). Government Control of Urban Merchants in Traditional China. *The Tsing Hua Journal of Chinese Studies,* 8 (2): 186-209.

[8] Ibid. p. 39.

Next, in the years of Ming dynasty, the Chinese Navy outnumbered the 3,800 ships, dominating the Indian Ocean from Borneo to Africa, until their official withdrawal from 1433-36 to 1567.

Not only power but also *market* is the 'event horizon' of McNeill's historical explanation; since 1100, the gradual, interactional, commercial transformation of the globe, with the increment of commodities and cash exchanges, with seamen, traders and commercial links, intensified; incorporating even outer, nomadic, Mongolian etc. interests.

Nevertheless, supposing one ought to stress the role of city-centers in the past, he wouldn't manage to offer an exact analysis, if he had failed to define the role of piracy. The rise of certain ports, from piratical headquarters to principal entrepôts, sustained from taxation, is not only critical to the development of business in preindustrial societies, but it is also related to the Chinese retreat from maritime commerce.

Admittedly, the ambiguity between raid and trade was broadly diffused for many centuries; Western Europe, especially, remained mainly rural until 1000, when knighthood appeared between the Rhine and the Seine rivers, engaging both in conquest and communication with the Near East, which influenced new markets, e.g. in Italy, Low Lands and Champagne. The cities were fortified, when traders and artisans demanded and paid for their protection. Later, they established their control over the surrounding countryside, in order to protect the commerce. But the situation between pope, emperor, merchants and landlords was usually rival.

2. *Regardless the long depression*

The role of the cities was further specified within the passage from the city-centred to the world-economies; according to their position in the hierarchy of zones in the international division of labour, e.g. between Portugal, Antwerp, Amsterdam, Bruges, Genoa, Venice, the Hansa, etc. Before 19th century, cities and armies were quite smaller.

In 15th century, Cologne's population wasn't bigger than 20.000. In 16th century, Istanbul had 400-700.000 residents, resembling an 'urban monster', according to Braudel. Moreover, immigration to America was emptying cities like Seville, in 1526, whereas famine, plague, epidemics were decreasing population.[9]

The ruling classes of cities, e.g. Troyes in 1573, were striving to evacuate them from the suffering poor, by distributing gratis bread. In Paris, the sick and impaired poor were kept in hospitals, while the unimpaired impoverished were offering bondage work enchained. Meanwhile, in England, there were the *poor laws,* against the impoverished population, and all over Europe were spreading the poorhouses, the workhouses, the *Zuchthaüser,* etc.[10]

Economic cycles of depression and impromptu recovery were eminent in the history of material civilization, whereas progress was turning a heavy burden for the growing populations from 1100 to 1350, from 1450 to 1650, and after 1750.

[9] McNeill, W.H. *Plagues and People*. Oxford: Blackwell, 1977.
[10] Braudel, F. *Civilization and Capitalism, 15th-18th Century*. University of California Press. 1982.

Overland transport by road became available to a majority of Western Europe population, only around 1830, just before the railway revolution, as Braudel[11] insists.

The great discoveries of Abel Tasman, Willem Schouten, James Cook and many others combined the colonization plans with the scientific research, but also with commercial, industrial, transportation and military purposes. Moreover, the advancements in political and economical issues were comparably significant. The development of maritime commerce, followed by global trade and commercial treaties, e.g. the Anglo-French of 1564, was highly important for cities such as Paris, Hamburg or Antwerp.

Another outstanding example was the Treaty of Tordesillas (7.6.1494), which divided the newly discovered territories between Portugal and Spain along a meridian, 70 leagues of the Cape Verde Islands. Nevertheless, Portugal and Spain pioneered the European overseas exploration, with Spain representing a greater threat to the British Empire.

The great oceanic discoveries facilitated global trade and exchanges. During the first centuries of the medieval economy, not only the feudal but also the urban were based upon personal consumption. Production for the purpose of exchange was only beginning to emerge, when global maritime relations opened the raw materials trade for the heavy mining and metallurgical industry.[12]

[11] Braudel, F. *Civilization and Capitalism*, Ibid.
[12] Hessen, B. *The Social and Economic Roots of Newton's Mechanics.* New York. 1971.

The foundation of commercial companies, such as the Verenigde Oostindische Compagnie (Dutch East India Company) in 1602, was another consequence of the great oceanic discoveries.[13] The antagonism between Spain and Netherlands led Dutch merchants to develop trading from the Baltic area and the Atlantic to Russia, Italy, West Africa, America and Asia. Their traditional shipments of grain, salt, herring, and wine, were supplemented with luxury textiles, sugar, metals, jewellery, weapons, spices, etc.

The tobacco from America had a spectacular dissemination in Europe, after Columbus' discoveries. On the one side, hence, the economic life with its currencies, commerce, trading centres and fairs; on the other, the 'material world,' as Braudel[14] insists, non-economy, self-sufficiency.

The geographic expansion resulted also to the dissemination of the part-ownerships or share ownerships, which had a decisive influence in financial sphere. However, the network structures between principals and agents proved to be vulnerable by uncertainty and infighting problems that undermined the Dutch hegemony and opened the way for the rise of the English empire.[15] The English East India Company, founded in 1600, had headquarters in Bombay, Madras, Calcutta, etc., headed by a Governor General or President and a Council of senior merchants.

[13] Gelderblom, O. and Jonker, J. 'Completing a Financial Revolution: The Finance of the Dutch East India Trade and the Rise of the Amsterdam Capital Market, 1595-1612', *The Journal of Economic History,* 64 (3), 2004, pp. 641-672.
[14] Braudel, F. *Civilization and Capitalism, 15th-18th Century*. University of California Press. 1982.
[15] Adams, J. 'Principals and Agents, Colonialists and Company Men: The Decay of Colonial Control in the Dutch East Indies', *American Sociological Review,* 61(1), 1996, pp. 12-28.

Yet, the English metropolis maintained the central position, while the Batavian High Government held a privileged position in the Dutch East India Company.

Meanwhile, the introduction of public utilities represent an important milestone in urban history: e.g. “the water-wheel powered pumps built into an arch of the Old London Bridge by the Dutch engineer Peter Morice in 1582”, as Buchanan[16] explains, “and the more ambitious scheme of Sir Hugh Myddelton’s New River project in 1619, which brought water into the city through an artificial channel from the Hertfordshire countryside, relied upon river catchment in one form or other”. Urban “paving of market places” and “surfacing of roads with cobbles or granite setts”,[17] although resulting from different interests than inter-urban roads, was another historical milestone.

European economies, however, suffered from a major depression from 14th to mid 15th century, caused by stagnation or even decline of agricultural production, decreased agricultural productivity caused by Little Ice Age and an increase in epidemics. As a response, Europeans were motivated to develop technology to explore and take control of the trade routes. Thus, in the sixteenth century a world system developed, namely the capitalist world economy.

[16] Buchanan, R.A. “Public Utilities”. In: I. McNeil (Ed.). *An Encyclopaedia of the History of Technology*. London: Routledge, 1990, pp. 951.
[17] Ibid. p. 963.

3. *Center, Periphery and Technological Revolution*

Global trade and world civilization became feasible in the fifteenth and sixteenth centuries, when the political bureaucracies of the Empires declined in front of the technological and economical superiority of the naval mercantile powers. The turning point may be found in the rejection of Venice to take over the throne of the Byzantine Empire.[18] The dual pressure of rebellions and wars, such as the Hundred Years War, was the main reason of this overthrow of the political power by the economic one, regardless the long recessions.

Gradually, the flow of capital acquired more significance than the stock.[19] That is, a series of innovations in cotton textiles and later in iron industry triggered "a process of cumulative, self-sustaining change", typical for the Industrial Revolution, according to Landes;[20] while other researchers suggest that this continuous pressure for accumulation was "the leitmotiv of the capitalist world economy ever since its genesis in the sixteenth century".[21]

Regardless the *longue durée,* as presented by Braudel,[22] it is justifiable to support that the industrialization was caused by the emergence of a 'market society' and an agrarian capitalism, i.e. based on market dependency, market imperatives, thus on a social

[18] Wallerstein, I. *The modern world system I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century.* New York: Academic Press. 1974.
[19] Landes, David S. 1969. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750.* Cambridge, England: At the University Press.
[20] Ibid. p. 81.
[21] Wallerstein, Immanuel. *The Modern World System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730-1840s*. New York: Academic Press, 1989, p. 22.
[22] *Civilization and Capitalism 15th–18th Century.* 3 Vols. London: Collins and Harper and Row, 1981.

property form of capital.[23] Some of the most significant historical examples of the centre-periphery contradiction were given by technical revolutions, which began in *certain core countries* and spread to the periphery: Shipbuilding, banking, efficient production and industrialization were essential prerequisites to the emergence of global trade, during the Spanish, Portuguese, Dutch, British periods of dominance.

The Industrial Revolution in England, from 1771; The age of Steam and Railways, followed by the introduction of Steel, Electricity and Heavy Engineering in England, USA, Germany, and so on, built a global market and a world system, which was further diversified in the age of Oil, Automobile and Mass Production.[24] Thereafter, in center-capitalistic-countries, market, trade and competitive accumulation are strongly and increasingly interconnected; while peripheries are still providing alternatives for market, e.g. the agrarian systems in Eastern Europe[25] and Asia.

Moreover, the center-periphery contradiction is usually expressed as a contradiction between *capital-intensive production* in the highly industrialized countries and *labour-intensive production* in the periphery. The aforementioned theory is strongly influenced not only by the business cycles theorists, e.g. Juglar, Kondratieff,

[23] Wood, Ellen Meiksins. 2002. *The Origin of Capitalism: A Longer View*, London: Verso; Žmolek, Michael Andrew. 2013. *Rethinking the Industrial Revolution. Five Centuries of Transition from Agrarian to Industrial Capitalism in England.* Leiden: Brill.

[24] Perez, C. 2002. Finance and technical change*:* A Neo-Schumpeterian perspective. Tables 2.2, 2.3, pp. 14, 18.

[25] Gunst, Péter. "Agrarian Systems of Central and Eastern Europe"; Brenner, Robert. "Economic Backwardness in Eastern Europe in Light of Developments in the West". In: Daniel Chirot (ed.). 1991. *The Origins of Backwardness in Eastern Europe: Economics and Politics From the Middle Ages Until the Early Twentieth Century.* Berkeley and Los Angeles: University of California Press.

Schumpeter, etc., but also by the historical analysis of the Annales School and especially Fernand Braudel,[26] who emphasized the regional geological and ecological dimensions in global history. A critical issue in the centre-periphery relations is the redistribution between centre and periphery. The centre obtains: Access to a large quantity of raw material, cheap labor, enormous profits from direct capital investments, a market for exports, and skilled professional labor through migrations from the noncore to the core countries. Furthermore, the core countries are economically diversified, highly industrialized, specialized in information, finance and high-technology, powerful in military, and so on. On the other side, the periphery countries lack diversified industrialization and social-political organization.

According to the 'dependency' theorists who emphasize on national history, the redistribution refers to wealth and resources, exploited by the centre; on the contrary, what is redistributed is surplus value from the periphery to the wealthy countries. The core countries dominate in the fields of production, trade and finance.[27] This uneven distribution and inequality is caused by the demand for endless accumulation of capital, which requires high profits through monopolized commodity chains.[28]

[26] Braudel, F. *Civilization and Capitalism, 15th-18th Century*. University of California Press. 1982.
[27] Wallerstein, Immanuel. 1980. *The Modern World System II: Mercantilism and the Consolidation of the European World-Economy, 1600-1750*. New York: Academic Press.
[28] Hopkins, Terence K., and Immanuel Wallerstein, coordinators (1996). *The Age of Transition.* London: Zed Books.

The Interplay between Technology and Community

Along with modernity, the foundation of public electric and telecommunications utilities, altogether with the introduction of new technology and machinery, accelerate as never before the division of labour, formulate internal markets and promote commercialization. The industrialization appears as a revolutionary force (with the introduction of electricity, internal combustion engine, pumps, roller mills, cement, steel constructions, transportation, land reclamation, chemical industry, tractors, etc.). Thus, technology transforms radically the community life, by repetitively introducing multifaceted global innovations.

There is a dispute over historicists' arguments, on the ground of the uniqueness of human evolution, because the latter cannot be reduced to a universal, linear explanation of technological progress.[29] The innovative transformations are possible only in the level of a world system, which emerges after the birth of global trade.[30] "Global history," thereafter, as Serres[31] argued "enters nature; global nature enters history: this is something utterly new in philosophy".

Aside from that, on regard of the justified belief that there is interdependence between technological specialization and division of labour, we should raise the question about the limits of technological modernization and the obstacles which delay the

[29] Popper K. *The Poverty of Historicism*. London: Routledge, 1957.
[30] Paine, L.P. "Maritime History". In: W. H. McNeill et al. (Eds.). *Berkshire Encyclopaedia of World History* (Vol. 3), Great Barrington, Massachusetts, 2005, pp. 1188-1195.
[31] *The Natural Contract.* Ann Arbor: University of Michigan Press, 1995, p. 4.

introduction of modern technology in communities. Possible answers that one may attempt to give refer to the non-complementary and insufficient developing of mechanical engineering industry, resulting to the coexistence of modern and traditional technology, to the theoretical and practical failure of technology to create or recycle energy, etc.

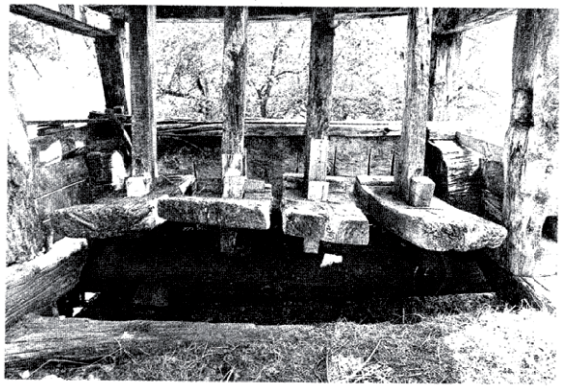
For centuries, the fire was the origin of artificial light. Cooking, heating and lighting, later metallurgy and pottery, were implemented by the use of fire. The pacified and regulated fire of the wick was present until late in many houses.[32] The popular image of electricity also, is not a novel conception, but an ancient one, which was gradually "connected to magnetism, the nervous system, heat, power, lightning, sex, health, and light".[33]

In the preindustrial rural space, technology was mainly based: a) on working animals, b) on muscle power, such as in outdoor olive mills that were still surviving at least until the 1940s in Cyprus, c) the wind power, e.g. the grinding windmills of Serifos, d) the hydraulic energy, e.g. the watermills channelling the water through the pipe, etc.

In the country and in the mountainous inland there was a long tradition of water-power, which included mantania, watermills and water-saws. The mantani in Samarina was used for washing and dyeing clothes.

---

[32] Schivelbusch, W. *Disenchanted Night. The Industrialization of Light in the nineteenth century* (transl. by Angela Davies). Los Angeles, London: The University of California Press, Berkeley, 1995.
[33] Nye D.E. *Electrifying America, Social Meanings of a New Technology, 1880-1940.* Cambridge, Massachusetts: The MIT Press, 1997, p. 1.



Mantani in Samarina, Greece, for washing and dyeing clothes

In fact, many periphery countries, especially Greece, approached the technological achievements of the West only after 1829, during the age of steam and railways. The introduction of *steamships, telegraph,* iron and coal, the founding of engineering workshops and the construction of *railways,* until the beginnings of the 20th century, marked a milestone in the developmental process in Greece.

Given the backwardness and the deficiencies in public services and road 'network', the lack of industrial differentiation, the absence of great ports, depots, city gas etc., with the emergence of innovation, technological specialization did not accelerate, but only somehow increased the division of labor, formulating clusters of an internal market and facilitating exchanges and commerce.

The social structure did not stand passive in the face of analogous developments, but delivered various critical attitudes, resistances and denials. This conflict was dealt, in peripheries and also in Greece, with *structural and physical violence* by the dyad of state and accumulated capital.

The repressive role of the armed forces was obvious to the dictatorships of the interwar period and beyond; the military and police units especially reacted violently, when facing the dynamics of the society-technology interaction and the emergence of the working class during the interwar period. Therefore, reactionary repression inhibited the dissemination of the technology.

Among the factors that facilitated the imposition of the political repression and the dictatorships, the most important were the successive interventions of the military, the technological armament (e.g. Air Force), the penetration of foreign capital and Greek businessmen of the so-called ‘Zurich cycle’.

Further influencing factors were the crisis, the ‘clearing’ system of commercial exchanges, the productive introversion of that period, the fascist emphasis on the centralization of production, the harnessing of the power of radio and film by the dictatorships, and the spread of limited companies mainly from the early 20th century.

Nevertheless, the completion of the electrification projects in the peripheries came only after the dramatic end of the World War II, and, especially, after the end of the civil war, in 1949, in Greece.

That was a significant contradiction, if one considers that the modern urbanizing technologies provide the basic infrastructures for peaceful creative social transformation; a negotiation which was obviously negated by the nationalistic, chauvinistic militarisms that mobilized the war-machines.

1. *The emphasis on the sea*

Alternative starting points of a history of technology might be, not only the significant issue of agrarian capitalism or of the agrarian origins of capitalism, e.g. cottage carpet industry in Minor Asia, but also the related problems of *technology transfer* from the West to the periphery, and of the *transition* from steam, gas and railway to electricity and automobiles.

In fact, Greece, during 19th century, introduced mainly railways and steamships. The effort to endow the country with roadway was able to flourish only around the small towns located on, or near, ports, in seafarers' towns that live and work focusing on the overall game of local exchanges, as Synarelli[34] stressed. Modern gas lighting, on the other side, was put in mass production in Northwestern Europe, firstly as industrial lighting. But Greece lacked industry.

Both, railways and gas lighting, were the most important technological innovations of the nineteenth century. They were so closely interrelated, that the railways began as a means for coal transportation, before their expansion to all other kinds of transport. Thus, coal industry was found in the centre of the industrial revolution in England.[35] Coal however is available in very different qualities and thermal capacities, which related directly to the range and level of industrial facilities developed in the various clusters, either of innovation or of technology transfer.

[34] *Roads and Ports in Greece 1830-1880*. Athens: Cultural and Technological Foundation of the ETBAbank, 1989.
[35] Schivelbusch, W. *Disenchanted Night. The Industrialization of Light in the nineteenth century* (transl. by Angela Davies). Los Angeles, London: The University of California Press, Berkeley, 1995.

Similar differences had a critical influence to the transfer of gas and electricity technologies to the periphery; whereas the development of electric industry was delayed until 1881 in England, by the preexisting gas and steam networks.[36]

The great transformation, however, was achieved through "integration to the extent of combining mining, rail-roads, docks, and fleets".[37] It was the sum of the common experiences, repetitive in time, across the mainland and the seagoing horizons, through the inventions in navigating, printing, typography, cotton industry, rotary kiln, railroadization and electrification, which managed to unify the scattered populations and to bridge the gaps in development.

On regard of Greece and its broader region, the main feature was the investments in transportation and especially *steamships*, during the second half of the 19th century, and *seagoing ships*, in the second half of the 20th century. The transport-communications sector experienced, since 1950, a remarkable increase among the overall investment activity, public or private, which soared from 2.62 billion drachmas in 1958, to 22.97 billion drachmas in 1974.[38]

Officially, the transport and communications sector displayed larger public than private gross investments, just because the seagoing ships were not included in the tables.

[36] Raftopoulos, T.I. *The National Electric Network of Greece.* Athens: Papazisis, 1946.
[37] Schumpeter J.A. *Business Cycles. A Theoretical, Historical and Statistical Analysis of the Capitalist Process.* New York: McGraw-Hill, 1939, p. 316.
[38] Hellenic Republic. *National Accounts of Greece, 1958-1975.* Athens: Ministry of Coordination, General Administration of National Accounts. 1976. Table 17.

Concerning, however, the proportion of shipping in private investments, we must observe the *upgrading of the role of the Greek entrepreneurs,* in the Anglo-American commercial antagonism, raising from the position of regional dependent (e.g. Greek communities in Egypt) to the status of the assets teammates (e.g. Greek ship-owners), which was the result of: a) The high technological advances that accelerated the internationalization of markets, b) the war reparations that reached to 500% of the value of the entire commercial fleet, and c) the 100 Liberty ships endowed by the U.S. to the Greek ship-owners in 1947. These Liberties tripled the capacity of the fleet.

Thus, the ship-owner Laimos[39] was arguing that the value of the ships of the Greek commercial navy was 5.5 billion dollars in 1967, while the country's national wealth without shipping accounted to $10.5 billion.[40]

Regarding this superiority of maritime commerce in Greek economy, the need for a repositioning becomes clear, not only regionally but also globally. Actually, placements in shipping constantly cover 80% of global transports, while benefited by the internationalization of markets, rather than the development of local economies.

[39] Laimos, A. *The Navy of the Greek Nation* (2 volumes). Athens: Tsikopoulos. 1969.
[40] Psyroukis, N. *History of Modern Greece.* Athens: Epikairotita. 1975.

2. *Non Complementary Development*

Greece, in the past, had no other choice than increasing imports from the West, but not from periphery, because the peripheral industrial enterprises were exactly *not complementary* to each other, and with agriculture. The so-called capitalist globalization has not surpassed, in developing countries, the fragmented industrialization, causing thus a growing trend for vital industrial imports: Raw industrial materials; Intermediate products; Mechanical equipment; Industrial consumer products, as a result of urbanization.

An example of the non-complementarity of the periphery industrial infrastructure is the following: During the second half of the 20th century the Greek industrial production included some basic metal industries: mainly aluminum, ferronickel, to some extent, and steel.

However, the entire nickel production and 85% of aluminum were exported. The aluminum industries which were settled in Greece, processed only in the first two stages of the bauxite, and exported the aluminum abroad, e.g. in France, for further processing.

All this happened because, in the context of globalization, the penetration of capital is based on the comparative advantages of each country, and does not take into account the needs of the country hosting the investments. The forms of control employed by the capital are: Direct equity participation. Assigning labels and similar agreements. Subcontracting, e.g. clothing, footwear, and textiles.

Multinational firms, for instance, outsource clothing production for the final stages of processing, which are labour-intensive processes, to periphery countries with low wages. Thus, in 1983, 43% of total Greek exports in clothing and shoes were subcontracted products. Immigrant laborers from Asia, Middle East, Africa and the Balkans work in these jobs.

Moreover, throughout the period 1950-1980, the export orientation and the increasing imports were leading the Greek economy to face international competition. The result was to prevail ultimately capital-intensive techniques (investment in buildings, structures and machines), and to curb the growth of employment in marginal sizes.[41]

Greece, during that period, maintains some typical characteristics of the periphery countries, i.e. it cannot be considered as economically diversified, highly industrialized, specialized in information, finance and high-technology, powerful in military. What is more, lacks diversified industrialization and social-political organization. This uneven distribution and inequality is caused by the demand for endless accumulation of capital, which requires high profits through monopolized commodity chains.[42]

[41] Antonopoulou, Sofia. *The After War Economy and the Housing Phenomenon* (Special Lessons of City Planning I, 7th Semester). Athens: National Technical University, Department of Architecture Engineering, Sector: City and Social Practices. 1989.
[42] Hopkins, Terence K. and Immanuel Wallerstein (coordinators). *The Age of Transition.* London: Zed Books, 1996.

Methodological Approaches

Many research traditions may be merged within our investigation, including the agriculturalists such as Damianakos,[43] the historians of civilization such as McNeill,[44] the historians of the technology such as Kline,[45] and the anthropological essays e.g. of the Modern Greek Studies.[46]

Chrysos Evelpidis, a valuable resource for the agriculture in the interwar period, mentions the existence of 9.536 mills in interwar Greece, of which 1,986 motorized, while the majority remained horse driven or hydraulic.[47]

The modernization was progressing slowly in the peripheries; through the introduction of horse-drawn wells and railways, heavy steam-powered plowing engines for land reclamations, and later, harvesters, balers, mowers, high-pressure pumps and especially the internal combustion engine. In the transition from the 19th to the 20th century, the steam mill popularized, although coexisting with wind power and plumbing facilities like water-powered olive presses.

---

[43] Damianakos, S. *From the Peasant to the Farmer. The Greek Rural Society toward Globalization.* Athens: Exantas / NCSR, 2002.
[44] McNeill, W.H. *The Metamorphosis of Greece since World War II*. Chicago and London: The University of Chicago Press, 1978.
[45] Kline R. *Consumers in the Country, Technology and Social Change in Rural America.* Baltimore and London: The John Hopkins University Press, 2000.
[46] Herzfeld, M. *A Place in History: Social and Monumental Time in a Cretan Town,* Princeton, NJ: Princeton University Press, 1991; Albauch, L.G. *Crete, A Case Study of an Underdeveloped Area.* New Jersey: Princeton University Press, 1953, pp. 245-46. Available at: http://www.questia.com/PM.qst?a=o&d=476749
[47] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect.* Athens: Editions "The Word", 1944.

There were also wineries, distilleries, canneries, mills, rice mills, dairies, water saws for timber production, etc. Another form of coexistence was among the handloom and the textile industry, which was the most prevalent processing industry. With the development of cash crops such as tobacco, olive-oil, cotton, vegetables, dairy, etc., and with the proliferation of manufacturing, transport and business, commercial and industrial centres were developed, and the closed economy of self-sufficiency was left aside. The storage capacity was a prerequisite for trade and it was facilitated by the construction of concrete cisterns for oil, wine, beer etc. and cooling towers, such as those made by the engineer Santorini. Trucks and electricity offered similar services.

1. *The Agriculturalist Stathis Damianakos*

In 2002, Stathis Damianakos' book *From the Peasant to the Farmer*[48] was published in Greece, translated by Athena Vougiouka. Six years before, this book had been published in French, following some other works of the author.

The reader easily understands that Stathis Damianakos is a distinguished Agriculturalist, well informed both of the Greek and the French sociological research on rural matters. He researches many statistical data and handles with ease the corresponding analyses, arranging with a critical attitude the statistical categories and the

[48] Damianakos, S. *From the Peasant to the Farmer. The Greek Rural Society toward Globalization.* Athens: Exantas / NCSR, 2002.

results of investigations.[49] His main concern, in this capstone work, is the theoretical clarification and delimitation, altogether with research documentation. Recurring to the Greek research tradition, Damianakos emphasizes the folklore theoretical origins of the newly established Agriculturalist discipline and stresses also the empirical contribution of the rural sociologist K.D. Karavidas. Extensive references are made to the French Rural Sociology, to the latest Greek surveys and to empirical and statistical data.

A basic truism of rural studies, as summarized by Damianakos, is the finding of the incompatibility, or the contradictory nature, of agricultural production within the generalized capitalist production. The author offers several empirical examples (including some traditional, conservative communities) to validate recent analytical approaches of sociology, which do not consider the rural community as a mere recipient of the *assimilative effects* of the system, 'but an active partner who reacts, retorts, resists'.

Consequently, the main position is that the modern rural reality in Greece contests not only the final victory of capitalist rationality, but also the principles of liberal democracy, the process of converting the farm to a business unit, and the vertical integration of the agricultural production in the agro-alimental sector. This contradiction is described by Damianakos with words as the following:

> *In Southeastern Europe, "urban" and "rural" spaces are always confused, the cities penetrate into*

[49] Damianakos, S. *From the Peasant to the Farmer.* Ibid. pp. 48-51.

the countryside up to the most distant edges of it; the country reaches to the heart of the city... The term "bourgeois-peasant", ought to the great Greek Agriculturalist K. Karavidas,[50] *doesn't present, in the best way, this deeply hybrid character of the Balkan peasant?*[51]

The cultural production also, of the mountainous regions of Southeast Europe, in literature, arts, crafts and manufacturing industry, indicate, according to Damianakos, that a flourishing of the rural areas was observed, in Greece especially, for long periods of time. The reader may suggest, along with the author, that the peasant is modernized, changed, adapted, but not passive; so that in Greece one may let recognize the 'triumph of the peasant', rather than the 'end of the peasants'.

To resume the historical explanation and reach the modern times, the author notes that we should not consider the Greek family-farm as a "business", not even as a "limited business" (as it is called in the western European countries), because in Greece this business is not profitable. Indeed, in a survey conducted in 1981, only 36% of the 957,040 farms were marked as "businesses".[52]

In this passage, however, despite all the previous rhetoric about the "resistance of the Greek peasant", Damianakos suddenly declares that he considers this non-entrepreneurial family farm as a

[50] Karavidas, Konstantinos D. *Agricultural Matters. A Comparative Study*. Agricultural Bank of Greece, 1978 (1st ed.: 1931).
[51] Damianakos, S. *From the Peasant to the Farmer. The Greek rural society toward globalization.* Athens: Exantas / NCSR, 2002, p. 31.
[52] Ibid. p. 56.

problem. He even proposes the same unacceptable solutions which are promoted by the European Union, e.g. the reduction in the number of farmers, the increase in the average area of cultivated land, etc. Otherwise the farmers' income, according to the author, will continue to be supported by the "institutional shifts in social surplus", and not by the relative abundance of wage labor.[53]

The second most important basic idea that Damianakos supports is that there is an inherent political dimension of Rurality, which is personified by an external force or social class, which, by managing the interests of the peasantry, subordinates the farmers. This social power is political, since what constitutes par excellence the 'rurality' is exactly this specific form of subservience to an alien power.

A key concept that is used within the same analysis, is the *dual social and local integration* of immigrant farmers. In the prefecture of Ioannina, for example, between 1961 and 1991, "the number of voters who exercise their right to vote in the village is, more often, far greater than the number that the census shows".[54] Since the 1970s, buses were being hired for the transportation of the expatriates to some villages for the day of the census. With this trick, a swelling, or even doubled population was presented. It is remarkable that villages which resisted modernization, as Greveniti, had not used, but only recently, those chartered buses.

[53] Damianakos, S. *From the Peasant to the Farmer.* Ibid. p. 90.
[54] Ibid. p. 60.

1.1. *Empirical studies*

The author visited and studied three villages of Epirus, i.e. Pyrsogianni, Aetopetra and Greveniti, many times. He noticed that they represent "ideal types" corresponding "to the three modes of reaction, the three different logics of adjustment, which characterize the evolution of the Greek local societies facing the postwar capitalist penetration".[55]

The first category of village, which Damianakos distinguishes, is typically outlined by Pyrsogianni, a large old village of immigrant craftsmen who 'built the entire world'. In the village, we meet today the 'second homes' of a community residing mainly abroad, while maintaining mutual associations in the village. The second type of village (Aetopetra) consists of more or less decisive integration in the dominant production system: 'direct involvement in the market', smooth adjustment to economic, political and cultural structures, weakening of local identity.[56] A third way was the resistance of the local community (Greveniti), which manages to maintain, to reproduce and, sometimes, to strengthen its internal structures.

A long sociological research was carried out by Damianakos in Vergina, which was made famous in 1978 by Manolis Andronikos' excavations. Even in the late 20th century, about a third of households in Vergina were stem families, extended families, or intermediate forms. "The hitherto assurances of certain ethnologists of the Balkan area, in favour of the primacy of the nuclear family and

[55] Damianakos, S. *From the Peasant to the Farmer. The Greek rural society toward globalization.* Athens: Exantas / NCSR, 2002, p. 167.
[56] Ibid. p. 173.

the ubiquity of dowry in Greece from the 19th century, are falsified".[57] In case of the exchange relations - which were developed in Vergina with the occasion of marriage - only after 1940 there was a noticeable change.

While before the war, the *groom* compensated the bride's family, in the postwar years the relationship was reversed, as with the provision of dowry the bride's family contributed financially to the groom. In reality, before the war, not even the other ethnic groups in the village (Pontian, Caucasian) knew the custom of dowry.

In 1977, the biggest and most mechanized farm in Vergina covered an area of approximately 100 hectares. Of these, a small portion (4.6 hectares) was self-cultivated, while the remaining was leased by dozens of smallholders from the neighboring communities. There were three tractors, a van, a seeder and a combine. The farm employed 500 wages for the cultivation of cotton, 90 wages for peaches, 100 wages for beet, and 30 wages for cereals, which altogether accounted for approximately 60% of the total working hours on the farm.

The combine was an additional source of income for its owner, bringing another 200 quintals of wheat from works in other holdings, an amount ranging between 8% and 12% of the harvest. In 1984, in the same holding only 30 hectares were cultivated (22 were leased). The wife worked exclusively in the Café-Patisserie and in the touristic shop that meanwhile opened in front of the royal tombs.

[57] Damianakos, S. *From the Peasant to the Farmer.* Ibid, pp. 117-18.

Obviously, as Damianakos observes, the switching of the employer, employee, self-employed roles is prevalent in rural communities, making capitalist relations even more complicated. The apparent and the hidden relations in exchanging goods, services or labor, *are interwoven* with informal ways to evaluate their work (e.g. mutual aid), and with the multiple ways of land use (in joint ownership, dowry, community lands, extended family estates) and they are in any case so original and peculiar, that it becomes difficult to identify and measure.

Moreover, the mechanization and modernization of farming techniques made progress in Vergina. In 1977, only 46% of farms had tractors, while in 1992 the percentage had risen to 68%. In 1992, everyone had enough water, and all had irrigation and pumping equipment, except from farms smaller than 20 hectares, where only 50% owned irrigation systems.

In 1977, the binding engines of tobacco-leaves and the planters were no more than ten in the whole village. In 1992, all the tobacco holdings owned binding engines, and 80% planters. Significant progress was also made in professional cars and telephones. 66% of the farms in 1992 had a van or truck. 84% of the farms had telephone.[58]

[58] Damianakos, S. *From the Peasant to the Farmer. The Greek rural society toward globalization*. Athens: Exantas / NCSR, 2002, p. 134.

2. *Consumers in the American Country, by Ronald Kline*

In 2000, Ronald Kline published *Consumers in the Country, Technology and Social Change in Rural America,* a rich in empirical data book that enlightens the reader about the phases and the social implications of the U.S. rural electrification. The author carefully narrates the process of innovation and highlights the inventive behavior of farmers in the new American land, with all their talented and untiring efforts to equip and organize their farm. The orientation of the book is revealed by its very structure, since the first four chapters deal respectively with the telephone, the automobile, the household appliances and the radio.

Kline remarks that *automation* was the modernist project that brought together the strongest and the most intense interests of the U.S. farmers. Early skepticism about electricity was soon replaced, in the second decade of the 20th century, by an extensive use of the phone (33%), automobile (60%), radio (20%) and electricity, in the rural regions of the country.[59] The word 'technology', however, did not enter the everyday vocabulary of Americans, before the 1930s, when the ideology of technological progress and technological determinism prevailed.

In Kline's study, the central question is whether the telephone, the car, the radio and the electricity were autonomous social forces that revolutionized rural life in ways predicted by their promoters. As proposed by the author, a key word is 'resistance'. Quite early, by the breaking of the recession in 1870, laborers in Midwestern U.S.A.

[59] Kline R. *Consumers in the Country, Technology and Social Change in Rural America.* Baltimore and London: The John Hopkins University Press, 2000, p. 5.

were sometimes destroying machinery, whereas, before the Second World War, new resistances appeared in scientific agriculture and home economics.

Meanwhile, some of the means of resistance were: explosive traps on the streets to save the animals from cars, musical performances through telephone lines, and boycotts in cookers. The farmers in Midwestern regions avoided buying modern appliances, and even today many of the sects of the Amish refuse to purchase phone or car. It is no coincidence therefore that the study of Kline rejects technological determinism: Neither the mediators of technology are simply channels of technology diffusion and cultural values, nor the users are passive consumers. Through a fragmented process, the farm replied, resisted and eventually incorporated the new to the old, and the villagers selectively modified and used these technologies to create new rural cultures, new forms of agrarian modernization.

Theoretically, Kline describes an interactive social construction: The farmers reinterpreted the four quasi-urbanizing artifacts and systems (telephone, car, radio and electricity), using different ways, often changing them. The technology producers responded to these acts, introducing respectively modified technologies. The result was new forms of technology and rural life.

The first urbanizing technology was the telephone, because as Kline explained, it was much more controllable than the car. Farmers and farm women resisted to the profit oriented phone companies, proved themselves as more innovative and used even

the ubiquitous barbed wire fences of the fields west of Mississippi, to build the first private networks. Where gaps or intersections were found, they pulled galvanized wires from a fence to the other. They called these lines squirrel lines, because the animal is running on the tops of the wire over the tree trimming.

As pointed out by Kline, the model of cooperative had a long tradition in the U.S., and Scandinavian origin. Since the 1870s, when the cooperative movement developed, there were already clusters of grain elevators, cooperative dairies, creameries and farm animal pens. The linking of provincial towns with the farms was realized thanks to cooperative telephone companies, e.g. in southeast Iowa 90% of 251 telephone companies were cooperative. Thus, the telephone was interwoven with the life of the farmer.

The farmers, facing the high prices of electricity utilities, fled to the American agriculture's antitrust tradition and formed cooperative electric companies. This form of resistance was popularized because of the success of the telephone cooperatives and the similarities between the two technologies. In electric companies, however, the technology was much more complex, engines were larger, thousands of kilowatts should be produced, their voltage should be increased to thousands of volts; then transmitted safely to the farms, and finally their potential difference should be reduced to 110 volts, suitable for home lighting and electrical appliances. The goal was so complicated that the cooperatives were persuaded to purchase electricity from the utilities, which already held the productive equipment, and distribute it themselves in the countryside (which was considered unprofitable by the utilities). In the decade

after the World War I, at least 34 rural electrical cooperatives were formed, mostly in the Midwest and the Northwest, where neighboring power sources were found.

Focusing the narrative on the protagonists of electrification, Kline refers to the automobiles engineer Charles Kettering, who became in 1913 the famous inventor of the fixed power unit *Delco Light*, which sold 40,000 engines until 1918, attracting the one-third of the market until 1923. These sets were the most sophisticated technology into the farms during that period. By 1919 the *Delco Light* had sold 200,000 generators, and 600,000 by 1929. Until 1923, 180,000 farms were linked to the distribution grid of electricity.

The radio, however, was the most popular new technology. In 1919, the U.S. Navy, claiming concerns of national security, had encouraged the *General Electric* to acquire the British-owned *American Marconi*, forming together with *Westinghouse* and *American Telephone and Telegraph Company* (AT&T) the *Radio Corporation of America*.

Kline's method is to investigate carefully all elements of resistance and transformation expressed through situations of technology reception, and to explore how the manufacturers answered to the trends of resistance. The telephone, for example, in the beginnings was used in many irregular ways: churches delivered sermons through the phone, a political conference broadcast the speeches delivered through the telephone, while rural telephone companies provided news, weather forecasts and market reports for their subscribers.

The resistance to the phone was ultimately insignificant compared to the crusade against the ‘devil's wagon’, the automobile. At first, the farmers resisted the invasion of the cars in their lives and avoided them more than the telephones, because the automobile was very expensive, it bellowed in the countryside and prevented the traffic of carts on rural roads. In West Virginia and Pennsylvania, laws prohibited the automobile, and around 1908 the law required that the cars should lower speed whenever approaching a skull, or stop when the horse was afraid.

Rural resistance is recorded carefully until the time of the decline of the resistance and the reverse path, when, in 1905, newspapers such as the *New York Times,* changed their opinion and began to write positively about the car. Rural organizations stated that the car is ‘a permanent feature of modern life’, and the *Rural New Yorker* began to promote the car in 1909.

From that time onwards, the interweaving of the car with the rural life involved the cooperation of many different agencies, organizations and companies that transformed their products and technological networks to meet the needs of the farmer for electrification.

During the same period, the lack of modern facilities, such as electric oven, warm air, hot water, sewage, bath and lighting systems, was very noticeable. Alongside many voices were calling to improve the working conditions of rural women. Mattie Corson, the daughter of a rural woman who died from overwork, conducted by mail one of the first investigations and asked farm women several

questions about life in the farm, e.g. if they would marry a farmer, or whether they would encourage their daughters to marry. The farm women pointed out the issues of overtime work, unhealthy working conditions, preventing education, the social importance of a large crop for the purchase of communication and transportation technologies, etc.

During the agricultural recession of the 1920s and 1930s, the radio disseminated across the American countryside. The representatives of the counties in each state suggested that in 1923 there were 145,000 radios in country's farms. After 1940, the percentage of farmers with radios surpassed the percentage of those owning a car, a telephone, electricity and water supply.

Comparing the progress of the U.S. with that in Europe, Kline notes that in the interwar period, electrification had reached only 14% of the American farms (6,000,000). By contrast, in Northern Europe, Germany, Denmark and Switzerland, the coverage of farms by the electricity grid was total.

Furthermore, Kline[60] reveals the role of social conditions in the interweaving of technology with country life; he discusses how amateur radio helped to determine the message of radio, altogether with the introduction of the broadcasting, while, in a similar way, the consumers of telephone and car were shaping their own message. All these groups of users were agents of technological change.

[60] *Consumers in the Country. Technology and Social Change in Rural America.* Baltimore and London: The John Hopkins University Press, 2000.

This narrative of the history of rural electrification in the U.S, transmits some of the most instructive lessons that the American people got by the greedy actions of capitalist enterprises: During a campaign in 1932, with a speech at Portland, Oregon, a local centre of the movement for public power, Roosevelt was criticizing the ravenous electrical industry, with its symbol, Samuel Insull. The magnate flew to Greece to avoid arrest, accused of larceny and misuse, since the complex pyramid of his companies had collapsed, depriving thousands of shareholders.

A subsequent phase, that the author distinguishes, comes with the establishment of the *Rural Electrification Administration*, which, after a decade of continuous competition between the public and private sector, eventually offered the means for the electrification of farms. On July 1, 1936, REA came into existence with a ten-year mandate to power the farms in the country, lending mainly public institutions with 410 million dollars, with an interest rate of 3% and a term of 25 years. The vast majority of borrowers were nonprofit cooperative associations, which would purchase electricity from electric companies to sell it to their members through lines to be built by those loans.

Later, the war allowed a renewed prosperity for American agriculture. The net income from the farming sector was tripled, from 706 dollars per farm in 1940, to 2,063 in 1945. The good times continued after the war, since the period from 1940 to 1952 is the longest continuous period of prosperity in the history of American agriculture.

Productivity had increased dramatically, because of a feverish rise in mechanization, high-yield crops, extensive use of chemical fertilizers and pesticides, increased specialization, and adoption of marketing and new technologies.

Thousands of small farmers abandoned their land, because of the high cost of farm equipment and government policies that favored big farmers. The costs could not be met due to lower prices of agricultural products as a result of overproduction. Consequently, the number of farms decreased from 6.1 million in 1940 to 2.73 million in 1969. Similarly, the number of rural population declined from 30.54 million in 1940 to 10.3 million in 1969.

The farmers were traditionally using the technology to undermine monopolies, as implied by Kline. Even in the late twentieth century, farmers continue to use new technology in innovative ways to create their own forms of modernization, as a farmer plowing while talking on his mobile phone. Thus, the urbanization of rural life is part of a complex, competitive process. The technology is not an autonomous social force, because of the resistance mediated at the level of everyday life, the wide variety of applications, the intertwining of technology with life.

3. *The Big History of McNeill*

W.H. McNeill's book, *The Metamorphosis of Greece since World War II,* is the aggregate result of an empirical investigation that lasted over 30 years, from 1945 to 1976. The author participated personally in the American Mission for the reconstruction of Greece, contributed to the implementation of the plan for the country's reintegration in the capitalist system and visited many times the Greek countryside, villages who suffered in the beginnings, but later lived the postwar 'success stories', as the protagonists of the Marshall plan insist.

With a comprehensive, detailed, well crafted and succinct writing style, the author manages to convey the experiences of the changes observed in his successive visits in Greek villages, approximately every ten years, in 1945, 1956, 1966 and 1976. The historical explanation that McNeill attempts to give is shaped by various approaches such as geographic, topographic, climate and economy. Among the factors which may explain human behavior, McNeill takes into account the material needs (e.g. scarcity of goods, hunger), technological improvements, and the practices of violent enforcement and subordination under the structures of power (e.g. robbery, population displacement), etc.

McNeill, when expounds the Greek reality, contends that he is trying to set forth the key elements of traditional structures, local economy, language and religion. Thus, he identifies as a characteristic of the daily behavior of the Greek farmer, his traditional ability to bargain. The ability for financial trading is an

attribute that stands immediately out the Greek farmers from those peasants which self-consume their own harvest, as the author believes. The bargaining, the emphasis on purchasing and selling, is considered by the author as a 'traditional model of Greek agriculture', which maintains its opposite, that is heroism.

To support his opinion, the North-American historian, refers to the, widespread in Greece, crops of *olives* and *vines* that give an easily storable harvest, unlike the traditional cereals cultivated in Egypt and Ukraine. A remarkable geographical and climatological Mediterranean specificity, favoring the diversification of crops, caused an increase of the cereal - oil - wine exchanges and trade in the Mediterranean, followed by the sequential inputs of other storable and marketable products, such as cheese, wool and meat from the highlands, and raisins from the lowlands.

The author stresses that the Greek olive-oil producers and vine growers were unduly benefited by commercial activity, because their products were stored more easily. Furthermore, the close linkage between the production, consumption, purchase and sales units, and the nuclear family, acquired a particular importance within the rural society.

In the course of his argument, focusing on the period of the Cold war, the author denies the prominence of collective production in Greek villages, to overstate the importance of the nuclear family and private initiative. Similarly, the narrative incorporates some other compatible social phenomena such as robbery and migration, seasonal or long-term.

To understand McNeill's argument, the reader must take into account the different modes of production, extensively analyzed by the leading Greek agriculturalist Karavidas. Regarding rural structures in the early 1930's, Karavidas distinguishes six 'socio-economic formations': The *Zadruga*, Southslavian collective social formation, which covered several nuclear families; The *Tseligato*, social formation of semi-nomadic livestock breeders; The *Tsifliki* (manor), derived from the great Ottoman owned properties, cultivated by serfs; The main village, which is rather a formation of local management of community affairs; The limited peasant family; The bourgeois-rural, or 'mixed low-bourgeois-peasant' family.[61]

McNeill believes that the *collective production* is an exclusively Slavic mode of production, which is found solely in zantruga. Because of this, he emphasizes only upon landmarks compatible with his own explanation, such as the commercial - colonial model of ancient Miletus, the treaty of Küçük Kainardji, or the decline of the Greek maritime commercial activities throughout eastern Mediterranean, because of the competition between Balkan nations.

However, the author does not mention the Byzantine communities whose fleets reached, at least, until the remote Ceylon (Taprovani), or forgets the widespread practice of piracy.[62] This is because he is interested in stressing an alleged 'market-oriented behaviour' of the Greek farmers, exclusively.

---

[61] Karavidas, K. D. *Agricultural Matters. Comparative Study.* Athens: Agricultural Bank of Greece, 1978 (1st Edition: 1931).

[62] "The terror of pirates comes upon every passenger in the Greek seas", as Kyriakos Simopoulos (*Foreign Passengers in Greece,* vol. A'. Athens: Stachy, 1999, p. 87) suggested. The "crisis of the Byzantine Empire coincides with the organization of piracy in Eastern Mediterranean" (Ibid. p. 96).

The omission of piracy from the list of the historical phenomena analyzed, can be explained only by examining McNeill's intention to consider, a-priori, the *business-oriented* behaviour as an almost specific difference of the Greek farmers. In formulating this definition, the North-American historian untangles the issue of collective production and, thus, divides the world into Slavic and business.

On regard of the 1940s, McNeill's narration becomes so dense, that is well worth to catch it from the beginning: The year 1941 was a milestone in Modern Greek history, because it was the time when the financing of the Greek economy by migratory remittances temporarily stopped. Thus, in winter 1941-42, thousands died from hunger. In early 1942, EAM grabbed the opportunity actively and the revolution begun.

Agrarian Crisis versus Capitalism

During the interwar period, the tobacco producers in Eastern Macedonia, the raisin growers in Peloponnese, the cotton farmers in Kopais lake, the sericulturists in Evros region, the grain monoculture farmers in Thessaly, the pastoralist livestock breeders all over Greece, produced "almost exclusively for the market". Nevertheless, the Greek market was, in general, not significant; it could not regulate the prices of agricultural products, but rather suffered "the impact of falling prices in the major centers of production and consumption".[63]

The effects of the agricultural crisis were analyzed by the Greek agriculturalist Evelpidis: "Agricultural crisis is an unfavorable economic derangement of the balance of rural populations in a wide range quantitatively, locally and temporally".[64] The unfavorable disturbance usually comes from falling commodity prices. The crisis is caused by the lack of coordination of production with consumption. The interpretations differ, however:

i. The classical liberal school argues that Supply and Demand 'may bring equilibrium rapidly'.
ii. But others admit that in a capitalist society there is a risk of overproduction.

[63] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect*. Athens: Editions "The Word", 1944.
[64] Evelpidis, C., Professor in the Panteion School of Political Science. *Agrarian Legislation and Agricultural Policy* (Concise University Lessons). Athens: Papazisis, 1943, p. 10.

iii. Or argue instead that there is a 'risk of sub-consumption, because labor wages do not increase accordingly, in order to consume the surplus' (Sismondi).
iv. According to others, depressions are temporary and violent solutions of the existing contradictions, violent eruptions which momentarily restore the disturbed balance.
v. Others argue that crises are due to changes in the quantity of money in circulation (quantitative theory). When the circulation of money increases, the commodity prices rise up; when it diminishes, they are reduced and recession begins (Ricardo, Fisher, Keynes).
vi. Others attribute the crises to external periodic events (wars, sunspots).[65]

After the end of Napoleonic wars, in the period 1820-1827, an agricultural crisis occurred, because of the direct development in production. This phenomenon was repeated with the expansion of overseas transports (USA, Australia) and the completion of the railways of Russia (which lasted from 1880 to 1906). After the end of World War I the crisis reappeared (1920-1927), as in the period from 1929 to 1934. The symptoms of the crisis in the years 1929-1934 were falling prices, even greater when measured in gold, because national currencies lost their value.

The depression was bigger in exporting rather than importing countries, because tariff protection was impossible. 'International market' prices ceased to exist. The crisis was worst on agricultural rather than industrial products.

[65] Evelpidis, C. *Agrarian Legislation and Agricultural Policy*. Ibid.

The causes of the recession, according to Evelpidis,[66] were: The increase in production (though small in itself, almost as big as population growth). The reduction in consumption, with probable replacements in consumed commodities. The technical advancements in agriculture and transport. Monetary-credit factors. Restrictions upon trade.

The policies implemented globally were: Reduction of production (this measure failed, except in the U.S.). Boosting consumption (failed). Regulation of trade (which amplified the crisis). Financial support for farmers (loans, subsidies, repealing taxes, settling debts).

Nevertheless, the adverse physical and economic conditions, the export orientation of the Greek agriculture (tobacco, raisins, wine, oil, figs, etc.), the poor harvests from 1929 to 1932 - which consisted a local sub-production crisis - and the high dependence of the Greek economy from abroad (credit, shipping, immigrants), made the Greek agriculture vulnerable to crisis.[67]

The consequences of the depression were: Increased acreage, because the farmer wanted to secure maintenance, while employing not intensive (fertilizers, etc.) but extensive cultivation. The recession was deeper in easily transportable goods (cereals, wool); on the contrary, the goods which were less profitably transportable (horticulture, milk, poultry) were less susceptible to depression. Therefore, due to the drop in feed grain prices, livestock tended to

[66] *Agrarian Legislation and Agricultural Policy* (Concise University Lessons). Athens: Papazisis, 1943.
[67] Evelpidis, C. *Agrarian Legislation and Agricultural Policy* (Concise University Lessons). Athens: Papazisis, 1943. Ibid. 12-13.

increase. But the prices of industrial products were not accordingly decreased; thus, domestic cottage industry was intensified (return to a closed economy).

The measures taken by the Greek governments were: Increased tariffs and restrictions on imports. Collection of products and especially wheat - that had already commenced before the crisis. Measures of social origin, such as suspension and, then, elimination of the land-production-tax, distribution of maize on credit to farmers and livestock breeders, settling agricultural debts, etc.

The recession benefited the national economy in general, because imported goods became cheaper. But the depression harmed the farmers, especially those engaged in monocultures (tobacco, currants, olive oil). The exported commodities were also burdened by foreign exchange duties. This was an aimless commercial policy, as Evelpidis thought. Restricting imports brought restricting exports, i.e. dumping against Greek agricultural products; regardless the unilateral protection of certain commodities and the particular increase of the metal drachma, concerning non-agricultural products.

In 1931, Evelpidis published a special study of agricultural crisis in Greece,[68] which analyzed the general characteristics of the recession, its causes and the so-called 'crisis medicines'. His contemporary crisis in agriculture was the result of the adverse disorder in the farmers' balance sheets.[69] It was produced by causes

[68] Evelpidis, C. *The Agricultural Crisis, especially in Greece*. Re-edition from the Archive of Economic and Social Sciences (Volume 11). Athens, 1931.
[69] Ibid. pp. 6-7.

attributable to production, consumption, circulation, and also by monetary and credit phenomena. The depression that began in Greece in 1929 acquired general features, expanding in all provinces and in all branches of agricultural production, but also outside Greece, into every continent and all states. The agricultural crisis impacted upon other sectors, such as industrial, "because farmers constitute the great mass of consumers of industrial products, and also the principal suppliers of trade and transport".[70]

However, there are differences between industrial and agricultural crises, since agricultural production is mainly affected by atmospheric conditions, while the industrial one 'is subject to cyclical crises'. In agriculture and livestock husbandry there is no cyclical crisis, regardless the alternating phases of underproduction and overproduction caused by the gap between preparation and output, and in spite of all the mechanization of agricultural productions.

With the exception of local crises, agricultural recessions typically exhibit the characteristics of durability. "Hence, while cyclical crises come and go relatively quickly - since from 1850 till today i.e. within 80 years, they are numbered to ten - the current agricultural recession is the fourth after 1800, i.e. within 130 years".[71]

The first crisis occurred after the end of the wars of Napoleon, and lasted from 1820 to 1827. That crisis had been prompted by the devaluation of the products "until the one-third of their price, while wages were kept unchanged",[72] interest rates remained stable,

[70] Evelpidis, C. *The Agricultural Crisis,* Ibid.
[71] Ibid.
[72] Ibid. p. 8.

taxes increased and credit fell by much. The second agricultural crisis began in 1870 and was particularly intensified since 1880, lasting until 1906, lowering considerably the price of wheat both in England, where there were no protective duties, and in continental Europe, where there was protection. The price of wheat was reduced by the development of transport and the participation of the USA, Canada, Argentina, Australia and Russia in the international market.

The third largest agricultural crisis began in 1920 and lasted until 1924. That crisis was caused by the concentration during the war of serious quantities of available cereal and mainly by the sharp postwar development of the European and global agriculture, with the return of soldiers to their land and the excessive increase in prices of agricultural products. Finally, the fourth crisis began in 1929.

1. *Agrarian crisis and gold*

In the years 1929-1930, a general decline in prices of agricultural products had become apparent worldwide. The fall in prices was shorter in farm products (butter, cheese, etc.), while the price of meat had increased in most countries. In Greece also, from 1929 to 1930, the price of raisins dropped by 9%, tobacco by 13%, olive-oil 18%, olives 14%, wine 15%, etc. The problem was exacerbated by the gap in prices, i.e. the disproportion between the prices received by the farmer for his products and the expenses he had to pay “for the means of production, the necessary objects and in general his

needs". Furthermore, the peasant sells his products at wholesale prices, while buying at retail. From 1928 to 1930, a significant drop in the wholesale price index had appeared, in all western countries (USA, England, Germany, Italy and France), ranging from 10.92% in England to 17.79 % in Italy.

By contrast, the retail price index had declined slightly, ranging from 1.3% in Italy to 5.59% in the U.S., while in France was increased by 10.47%. This meant that farmers were overburdened by commercial retail prices.

The fall in agricultural prices undermined the living standard of farmers and reduced their consumption in industrial and other products. In 1927, the International Economic Conference of the League of Nations recognized the interdependence of the various productive sectors.

The reduction in the purchasing power of the agricultural population had an impact on industrial production and consists one of the causes of unemployment, which moreover reduces consumption of agricultural products.[73] Contrasting the agricultural crisis in 1929, a previous crisis that began in 1880 resulted in a tiered, prolonged and smooth fall in prices. On regard of this, Evelpidis[74] stresses the following relationship between measures captured by the economists:

> *Certainly the prices of agricultural products, while adjusting labor wages on the basis of the law of the*

[73] Evelpidis, C. *The Agricultural Crisis, especially in Greece*. Re-edition from the Archive of Economic and Social Sciences (Volume 11). Athens, 1931, p. 15.
[74] Ibid. p. 13.

minimum, by representing largely the value of raw materials, they ultimately regulate also the value of industrial products, which follow the fall adapted gradually to the level of agricultural prices.

Moreover, the crisis caused a trend to abandon agricultural cultivation. In England, the rural flight was accelerated after 1880, because of the lack of tariff protection. "The cultivated land was confined to the half, intensive cultivation was abandoned and the number of rural workers was decreased between 1871 and 1911, from 1,500,000 to 900,000".[75]

Agricultural countries were also realizing that the revenues from sales of agricultural products decreased to a much greater extent than their payments for purchasing industrial products. The disproportionately small decrease in amortization rates - compared to the price index – caused even bigger problems in the balance sheets of these countries.

For this reason, the states which exported mainly agricultural products, i.e. Canada, Argentina and Australia, had banned, directly or indirectly, the exports of gold, abandoning the classic system of unrestricted conversion, which, according to the author, could guarantee the balance of currency exchanges. Another result of the crisis was to reduce the cycle of trade, which limited the turnovers in almost all economic sectors.

[75] Evelpidis, C. *The Agricultural Crisis, especially in Greece*. Re-edition from the *Archive of Economic and Social Sciences* (Volume 11). Athens, 1931, p. 15.

Furthermore, the author examined the effect in gold prices, i.e. the so-called monetary and credit factor. The commodities prices increase, when the market value of gold decreases. In contrast, the rise in the price of gold causes a fall in commodity prices. The discovery of gold in the Urals, California and Australia, had provoked, during the 19th century, the reduction of the purchasing power of the golden metal and a general rise in the price level. After 1877, however, the market value of gold was increased, commodities prices were devaluated and the crisis loomed.[76]

When gold production fell to the bottom, i.e. in the period from 1880 to 1890, the prices of products decreased as never before. In 1887, the exploitation of gold-bearing land in South Africa, and, a decade later, in Alaska, brought again into balance. The revaluation of the commodities launched again, after 1890, reaching its highest peak from 1906 until the outbreak of war, when the gold production reaches at its uppermost boundary. Of course, this price increase, mainly in Europe, came also from the raising of customs duties and tax charges. By contrast, during the war, the price fluctuations were caused by other causes.

It is worth noting, "That the reduction in the production of gold started mainly after the war and especially during the years 1919 to 1922, years of rapid fall in prices".[77] In Greece, however, the decline was not strongly felt due to the massive influx of foreign currency from ship-owning profits and immigrant remittances.

[76] Evelpidis, C. *The Agricultural Crisis.* Ibid. p. 17.
[77] Ibid. p. 15.

In 1930, the world gold production was 14% lower than the pre-war. At that time, the gold reserves in South Africa were being exhausted and, therefore, suggestions were made to reduce gold production. The exclusive use of gold as a monetary base that resulted after the repeal of the silver base, was leading to an increase in the demand for gold.

Certain changes, such as the rising use of checks, the spreading system of credit and especially the abandonment of the use of gold coins altered the trading habits. The result was to reduce the needs for metals and to save gold efficiently, instead of staying immobilized "in the enclosures or cabinets of the citizens. Essentially gold is no longer mainly currency today but rather the security of the currency".[78] Thus, simultaneously, by reducing the rate of annual production of gold below 3% of the global stock, an average increase in the quantity of the stock of gold in banks was also achieved since 1913, by 4.9% annually.

Many economists, particularly English, as stressed by Evelpidis,[79] argued that the economic crisis was caused by the bad distribution of the existing gold, as long as only two states, the U.S. and France, possessed almost the 3/5 of the existing gold reserves globally. The U.S. owned the 2/5 and France 1/5, causing thus a deterioration of the scarcity of gold in the rest of the world.

> *And the evil thing is that these two countries do not circulate that gold, whence a relative revaluation of prices would occur in those countries, having*

[78] *The Agricultural Crisis,* Ibid. p. 17.
[79] Ibid.

naturally an impact in foreign markets, but they mostly sanitize the gold in the safes of their central banks.[80]

Countries who possess gold, ask for excessive coverage requirements in gold. For this reason, the countries which do not have gold are compelled in increasing discount rate, with adverse effects upon trade, whose consequences are fall in prices and increased depression.

"It remains true", as the Greek agriculturalist continues, "that France, having large reserves of gold, suffers less from the global crisis. This, however, we think, that may be appropriately ascribable mainly to the equilibrium of the French production relative to consumption".

By contrast, in the United States the crisis occurs acutely, since the abundance of capital brought about the current increase in production that seeks today to range consumption in foreign countries, whose purchasing force remained reduced just because of lack of sufficient gold in these.[81]

For this reason, the increase in gold reserves did not result in raising prices neither in the U.S., nor in agricultural exporting countries, which also happen to be rich in precious metals.

[80] Evelpidis, C. *The Agricultural Crisis,* Ibid. p. 18.
[81] Ibid. p. 20.

The conclusion drawn by the author was that competition in agricultural products was not sourced from countries with undervalued currency - as happened with industrial products - but from countries with overvalued currency (U.S., Argentina, Canada and Australia).

2. *Agriculture in economic and social terms*

To distinguish urban from rural population, based upon the criterion of 10,000 inhabitants may seem arbitrary “but reflects in practice the reality” on the definition of the city, as Evelpidis[82] wrote in 1944. Many Greek towns and not a few villages, exhibited, early then, urban character, e.g. Lavrio, Nafpaktos, Aliveri, Galaxidi, Aidipsos, Loutraki, Hydra.

But certain towns were agrarian in nature, e.g. Menidi, Megara, Thebes, Levadia, Argos, Corinth, Amaliada, Filiatra, Orestiada, Giannitsa, Katerini, and Kilkis. Several other towns were inhabited partly by agricultural populations, e.g. Komotini, Drama, Serres, Florina, Arta, Alexandroupoli, Rethymno, and Nafplio.

In 1940, Greece had the highest rural population density across Europe. The scarcity of arable land was significant, since in every 100 hectares of agricultural land were found 157 persons belonging to the farming population, while in Bulgaria 118, in Yugoslavia 114, in Romania 97, in Italy 90, in Hungary 72, in Germany 52, in France 48, in the USA 17 and in Canada 11.

[82] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect.* Athens: Editions "The Word", 1944.

Before the war, there were one million family-farms in the country. Based on the 1929 census, 36.96% of the Greek farmers had insufficient property up to 1 hectare, 35.09% had a very little property from 1 to 3 hectares, 23.45% had a small property of 3-10 hectares, while 3.87% had an average property between 10 and 100 hectares and 0.15% had a large property over one hundred hectares.

At the two edges, 0.15% of the farmers held 28% of the land, while 36.96% of them had only 13.3%. Moreover, the very large estates, with more than 10,000 hectares, occupied 3.8% of arable land.

According to the same census, among a total of 954,000 farms, there were 768,899 owners of the cultivated land, 55,860 tenants, 31,501 serfs, 12,131 implanters and 51,751 without determination. Despite the limited use of agricultural machinery in the Greek countryside, there was according to the author, “hyperinflation of rural manpower”.

For this reason, the income of agriculture and related sectors is “just enough or, very often, not sufficient to nourish all this rural population”.[83] In 1929, the average per capita rural income was 4,200 drachmas, while the average per capita income of the urban population was 14,525 drachmas. In 1936, the average income of a rural family reached 21.685 drachmas, while the expenditure for their minimum living averaged 27,988 drachmas. The remittances coming by migrants intended just to cover this deficit.

[83] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect.* Athens: Editions "The Word", 1944, pp. 26-27.

The Greek peasants were spending 65% of their theoretical budget in food expenses, but their food was poor, especially in the highlands. Their meager costs for clothing and footwear covered 16% of their family budget, whereas many farmers were literally ragged. General expenses for soap, oil, medical treatment, judicial services, repairs, contingencies, were representing a 10% of the total.

Moreover, the social costs for tobacco, coffee shop, barbershop, church, etc. were representing 9% of their budget.

> *Finally, the homestead was generally badly-built and cramped, especially in the former manors, which often consisted of a single room without wooden floor and sometimes without windows. However, in some rich villages (tobacco-villages in Eastern Macedonia, cotton-villages in Veria, region of Vocha in Corinth) or even in villages where the peasants had resources by their work in foreign lands (Pelion, Cyclades, region of Sparta etc.) we find two story homes, prim, with adapted furniture, which reveal superior living standards.*[84]

But in most villages, sanitation was poor, and mortality was greater than in the cities. The villagers were seeking better lives in the city. Urbanism was manifested quantitatively by the increasing proportion of the urban population from 24% in 1907, to 27% in 1920, 33% in 1928 and 33.73% in 1940.

[84] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect*. Ibid. p. 27.

The Greek cities, however, could not feed the rural immigrants because they lacked industry. The only solution to the problem was to promote industrialization by producing electricity from hydropower. Not having another way out, the peasants turned to external and overseas migration.

In the decade 1901-1910, the average annual overseas migration was 17,351 people, from 1911 to 1920 it was 19,612, between 1921 and 1930 it was 9,137; in 1931-1937 it was reduced to 3,111, "and finally nullified by the prohibition laws" in the United States.[85] However, the Greeks in America, although most of them had rural origin, were occupied only by 0.1% in agriculture. Another consequence of the migration was to increase the percentage of women managing agribusinesses. Thus, 22.1% of the Greek farm-women worked in independent holdings.

In the past and almost until the Balkan wars, "the spirit of the closed economy" prevailed in Greek agriculture. Farmers and ranchers were producing the necessary for the maintenance of their families and were either self-sufficient or the peasants of the mountains were exchanging certain products with the farmers of the plains, i.e. complementing mutually their needs. Exceptions were some farmers, especially in North and West Peloponnese, which produced for the market (raisins), and some large landowners of Thessaly and Macedonia, which supplied the internal market with the bulk of their production in cereals.

[85] Evelpidis, C. *The Agriculture of Greece,* Ibid.

However, since the end of the war in Asia Minor, the character of the rural economy began to change and ultimately the type of semi-closed economy prevailed. Firstly, in the years of Evelpidis, 'islets' of closed economy still existed in some mountainous regions of the country lacking transportation, such as Tzumerka and Agrafa. In addition to the former, there were other farmers who constituted the majority and produced mainly for themselves, combining animal husbandry, agriculture, forestry, etc. But many others produced chiefly for the *market,* such as the raisins producers in Peloponnese and Crete, the tobacco-growers in Macedonia and Thrace, the olive growers in Lesvos, Corfu and Mani, growers of vegetables and fruits in Attica, Argolis, Crete, Pelion, the cotton growers in Levadia and Laconia, the winegrowers in Samos and Lefkas, the clover producers in Mornos, the nomadic pastoralists (Sarakatsanoi, Vlachoi, etc.), the cattle farmers around Athens and the sericulturists in Soufli. But often they were still trying to secure, on their own production, part of their staple diet.

After a certain point in time, traders or itinerant merchant agents came to the villages to buy the main items for sale. This indeed became the rule for those products, whose bulk of trade was being accrued to the hands of certain organizations or industries, especially as tobacco. In parallel with the progress in transportation, new technologies dynamically penetrated the countryside:

> *The growth of trade was facilitated by the progress in transports and especially during the last two decades, with the expansion of the road network for automobiles, which come and collect the goods from*

the village, in order to carry them during the same day at their places of consumption or trade.[86]

Moreover, the monetarization let the farmers to make a better evaluation of agricultural production and contributed to the intensification of production, and even to the shift towards more profitable crops. But the use of money enforced the dependence of the Greek agriculture on the international market, whose became a part; hence, the Greek agricultural production was affected by the international price decline in the early 20th century, after the general agricultural crisis in 1921-23 and also incurred hardly the impact of the global crisis in 1929-32.

3. *Scientific production and internal combustion motors*

A rather significant use of chemical fertilizers started in 1910, while their use by 1940 had reached the 130,000 tons. The use of chemical fertilizers was common mainly in southern Greece, while in the North, including Epirus and Thessaly, it was limited. Moreover, the fertilizers were more often used in the profitable cash crops (vegetables, raisins, plantations) and rarely in cereals.

During the same period, the use of pesticides (such as sulfur, molasses, sodium arsenite, nicotine, etc.) diffused across the country, but not for all diseases and crops.[87] The use of serums and

[86] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect.* Athens: Editions "The Word", 1944, p. 132.
[87] Ibid. p. 38.

vaccines for the prevention and control of animal diseases was also extended, but as Evelpidis added:

> *What is still deficient in farming holdings in Greece is the permanent installation. Only a few farms afford ordinary stables for farming animals. These are usually replaced by some makeshift huts or only shed (Tsardakia). Furthermore, the small, usually, rural houses serve generally as repositories for the products of the farm. Finally, the facilities for the necessary rural crafts are often still in primitive form. This is mainly because our farming holdings are very small to provide such expenses.*[88]

The plantations were suffering from the lack of appropriate farming technology. The citrus, fresh fruit, sultanas and table grapes cultivation was limited by climatic conditions, lack of water and irrigation. Cherries, peaches, apricots, pears, fresh figs and grapes should be grown close to consumption or transportation centers because they do not abide long and arduous transport. The lack of refrigerators except from Pelion (Agria), where there was a special refrigerator, obliged farmers to use refrigerators that served other purposes (Kalamata, Mytilene, Athens).

The use of technology becomes excessively important on rural crafts and industry, as Evelpidis wrote:

> *Most agricultural plants in the countryside are mills, whose number throughout Greece reaches the*

[88] Evelpidis, C. *The Agriculture of Greece,* Ibid. p. 39.

9,536, of which 1,986 are motorized. The majority of rural mills are horse driven and some are water powered. Since many years, however, agricultural mills use internal combustion motors.[89]

Regarding the means of expropriation, the peasants had, in the prewar period, redundancy of working animals, i.e. a couple corresponded to 8.5 hectares of agricultural land and to 3.5 hectares of ploughed land per year.

Moreover, 1,600 tractors and mechanic ploughs were used, 335 of which belonged to the state, amounting in total a power of 50.000 HP; around 10.000 pump motors with approximately 50.000 HP; 6000 windmills for moving pumps, with a power of 2.000 HP. Namely, machinery with a total power of nearly 100,000 mechanic horses against the 540,000 mechanic horses representing the working animals in Greece.[90]

Also available for growing, was a sufficient number of plows, mostly iron, several mowers in Thessaly and Central Macedonia, some threshing machines in the lowlands, the necessary sprayers, sulfurizing machines, especially in vine-growing regions etc. However, there was a lack of useful machines and tools, despite the large increase from 1929 to 1939:

[89] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect.* Ibid. p. 35.
[90] Ibid. p.115.

Farming machinery	1929	1930
Mechanic ploughs (with many mouldboards)	700	1.578
Iron ploughs	241.548	333.775
Wooden ploughs	286.534	270.198
Iron harrows	20.321	42.700
Sowing machines	181	9.500
Threshing machines	606	1.070
Combines	-	42

The Agriculture of Greece, Economic and Social aspect, p. 37

By 1944, 160 cooperative mills had been established, usually with financial support and technical guidance by the Agricultural Bank. During the same period, factories were established in the major vine-growing centers (Athens, Patras, Santorini, Crete, Mantinea, Naoussa, etc.) by various companies. Then, the cooperatives of producers in Lefkada, Santorini, Megara, Markopoulo, Chalkida, Samos, Crete, etc. prevailed.

At the same time, there were about 100 wineries, mainly in rural areas, of which 47 belonged to 20 companies, 12 to the Autonomous Raisins Organization, 25 to cooperatives and the rest to individuals. There were also distilleries, canneries, raisins industries (Patra, Kalamata, Patra, Katakolo), figs sterilizing and fruits drying companies.

The mills in Greece in 1944 amounted to 7,676, of whom 2,106 were motorized, while the rest were watermills or windmills (Cyclades). Meanwhile, the importation of flour was expanded in villages of Peloponnese, mainland and islands.

Modern choices were made by villages of the lowland Corinth, where cars owned by bakeries in Corinth, Kiato and Derveni served that area. There were also carob-mills, rice mills, sesame-mils, etc. based usually in cities, red-pepper mills in Karatzova.

The agricultural schools in Cassaveteia, Larissa, Manolada, Ioannina and Crete had established permanent dairies. For the production of butter, centrifuges, separators, etc. were introduced. "The cheese also, even the soft one, are increasingly sent and kept to ripe in refrigerators instead of the Homeric caves, which were previously used for this purpose".[91]

In the interwar period, several water-jigsaws operated, especially in Epirus, Central Greece, Chalkidiki and mountainous Thessaly. "The Ministry of Agriculture", as Evelpidis[92] adds, "installed standard saws, with many blades (cataracts) in Artemisia (Kalamata), Chrysovitsi (Tripoli), Makrakomi (Lamia) and Skotina (Katerini)". The Greek timber industry processed each year 130,000 cubic meters of timber, but many plants were located in cities.

Another kind of industry was processing the resin, for the manufacture of rosin and turpentine (white spirit). There were 23 plants of that kind in Greece, most of which were located in rural resin production centers (Eleusis, Argos, Aspropyrgos, Koropi, Megara, Cassandra, and Evia). Most plant fiber processing industries were concentrated in Athens, Piraeus, Thessaloniki and Volos.

[91] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect*, pp. 125-26.
[92] Ibid. p. 127.

A few cotton gins remained in the semi-rural centers of Levadia, Edessa, Veria, Lamia, Thebes, Gytheio and Limnos. The first three of these were also using waterfalls. The ginning industries were 104 with 9,798 saws. In the regions of Thessaloniki and Veria there were cannabis-industries, while the rope-industry in Corfu imported the raw material from abroad. Throughout Greece, there were 350,000 to 400,000 handlooms. In Arachova Parnassus, Arnaia Chalkidiki, Pindos and in some barren and remote villages, like Livadi Olympus, the families of the villages were manufacturing and trading textiles, earning usually a small income. For trade was also meant the silk production in Soufli, Edessa and Chania. But in the rest of Greece most families were usually working to meet the needs of the village.

Strangely perhaps, most of the carpet factories were established in the cities, while the carpet in Asia Minor had acquired the peasant character of *cottage industry*. "Today", commented the Greek agriculturalist,

> *Among a production of about 70,000 square meters of carpet in the whole of the country (1939), only 20% of carpet industries are installed in villages. And this, despite the serious attempts of the Carpet Organization, who founded prewar 37* carpet *schools in different spatial regions of Greece, which they alone, produce annually approximately 6,000 sq.m. oriental carpet.*[93]

[93] Evelpidis, C. *The Agriculture of Greece, Economic and Social aspect*, pp. 129-30.

4. *"The electricity in the countryside"*

The first machines introduced in agriculture were horse-drawn treadmills, for various tasks. The steam was used in exceptional cases, in some large farms, "while heavy steam-ploughs were only sporadically used exclusively for clearance".[94] The last decade of the 19th century about 200 mowing machines were introduced in Thessaly. The steam-ploughs had appeared for the first time in England in the 19th century. But in Greece, in 1893, we met steam-ploughs only in the province of Almyros, in the village Akitsi, adjacent to an Agricultural School. Even in the first half of the 20th century, agricultural production was using mainly working animals.[95]

The introduction of the engines accelerated the division of labor and commercialization. The internal combustion engine caused, in many regions, a real disruption of the old-aged cultivation methods, in threshing, pumping, etc., in any work requiring movement. The engine was already being used widely as a supplement to animal traction but many times replaced it.

The electricity used in Greek agriculture at the time of Evelpidis was almost exclusively implemented on tasks that can be done with a steady source of energy. On the contrary, an official statistics of 1925 shows that German farmers were using electric motors, gasoline-motors, steam-powered, water-powered, diesel, water turbines and gas power combustion engines.

[94] Evelpidis, C. *The electricity in the countryside*. Athens: Papazisis, 1943, p. 8.
[95] Kallivretakis L. *The dynamics of rural modernization in 19th century Greece.* Athens: Educational Institute of Agricultural Bank, 1990.

During the same period, with the exception of lighting and irrigation, the use of electricity in the countryside "will generally depend upon the mechanization of agriculture".[96] The introduction of machinery in agriculture was aiming not so much to increase yields by increasing production capacity, but mainly focused on the replacement of labor. That's why motoring expanded mainly in countries with intensive farming and large population sparseness, especially in the countryside (USA, Canada, Australia, USSR, etc.). Additionally, the motorization of agriculture was promoted for the settlement of labor difficulties, and opens the way to improve living standards. Moreover the machine is not only intended to replace the human force, but brings forward new applications and new fields of work, e.g. developing means for harvesting and transporting crops, creating innovative irrigation and drainage facilities, but also for electricity, electric heat of plants and animals, etc.

Electricity is the most refined form of energy, easily transformed, the more deferential, and therefore suitable in the most appropriate way to the farm work. The electric motor was cheaper and more accessible for small or medium-size farms, mainly for irrigation, while the steam or diesel engines were more expensive. For that reason, in Germany, most electric motors were used in medium farms of 20-50 hectares. The large farm, however, is alike to many factories together, rather than to one factory alone, and thus, it uses the "most different machinery for performing the most dissimilar works".[97]

[96] Evelpidis, C. *The electricity in the countryside*. Athens: Papazisis, 1943, pp. 8-9.
[97] Ibid. p. 11.

Different conditions by country caused the expansion of electrification in rural areas: the scarcity of labor in the countryside (USA), high salaries (Sweden), the industrialization policy of the whole country (USSR), or, conversely, the desire to keep farmers in villages (France, Switzerland), the thrift in imported fuel (Japan), etc.

The electrification can occur as a social request, when rural residents express a general desire to improve their living conditions, as happened in France. But later, the problem of delayed reward funds emerged, caused by long term loans or even indirect routes. “Finally”, as Evelpidis observes, “to the rural electrification in Sweden contributed the increase in wages of farm workers, the shortening in the hours of labor, the severity of health regulations and the demand for higher quality of agricultural products”.[98]

However, rural consumption in individual countries was very low: 4% in Germany, 2.7 % in the U.S., 2.3 % in Japan, 2% in Czechoslovakia and 0.7% in the USSR. More ‘effective’ was electrification to the underemployment of farm laborers. In Czechoslovakia, where 60% of communities had been electrified, the rate of “paid wages decreased from 29.5% to 21.5% of the total expenditure per hectare”.[99]

In the course of his narrative, Evelpidis made a number of significant observations: In Switzerland there was no coal and, for this reason, electricity ranked higher in economic life, 98% of homes were electrified, as well as 94% of the rail network. For every 1000 residents there were 42 electric kettles and 27 electric cookers (12

[98] Evelpidis, C. *The electricity in the countryside*. Ibid., p. 17.
[99] Ibid.

in the U.S.). However, despite the electrical progress, during winter Switzerland was heated with the abundant timber of the country, because the pipelines of the hydrodynamic facilities froze in the winter. Thus, while electrometallurgy and electrochemistry were developed, the farming electrical applications were limited. Furthermore, in the USSR, during the first five-year plan, the internal combustion engine was the main factor in the social and technical rebuilding of agriculture and still continued to be in the following years. The development in the USSR was rapid. Whereas, until 1928, only 0.02% of the total energy for agricultural use was associated with the local substations network, seven years later, in 1935, the relevant percentage was 41.3%.

Meanwhile, in Greek towns and villages, 338 electrical companies were active in the interwar period. In detail, the numbers of electric power distribution facilities in towns and villages were:

Aetoloakarnania	10	Zakynthos	1	Laconia	8
Argolidokorinthia	21	Heraklion	1	Larissa	23
Arcadia	6	Thessaloniki	17	Lassithi	5
Attikovoiotia	41	Ioannina	4	Lesvos	17
Arta	1	Corfu	2	Messinia	24
Achaioilida	22	Kavala	6	Pella	2
Drama	8	Kefalonia	5	Rethymno	1
Evros	4	Cyclades	20	Preveza	4
Evia	18	Kozani	7	Rodopi	5
Samos	8	Fthiotidofokida	18	Chios	4
Serres	15	Florina	2	Chania	3
Trikala	2	Chalkidiki	3		

Evelpidis, C. *The electricity in the countryside,* 1943

These facilities operated mostly with coal or oil, except in Patras, Chania, Agia, Veria, Naoussa, and some other minor utilities, which had hydrodynamic units, often with supplementary heat unit. Lignite reserves had been found, in Chios, Lesbos, Samothrace, Sitia and Plakias Crete; it was also possible to use small waterfalls, as in the Monastery of Vella in Ioannina.

The author observed also that the economic importance of agricultural production was great, since from 1927 to 1936 the ratio of agricultural income in the total national income remained approximately constant: 1927 at 34.4%, 1932 at 35.6%, 1936 at 36.6%, avg. 34.4%. Furthermore, 60.5 % of the population engaged in agriculture, animal husbandry and forestry.

5. *Electrification and social change*

Electrification is a factor of social solidarity, because electricity supply cannot be limited to a certain farm or village. “It must handle the power from grids and especially from the secondary ones, by tapping and transforming the voltage”.[100] The companies have no interest in offering power to individual producers; hence the issue of cooperatives is introduced.

From the perspective of interest, one is not allowed to have profit expectations from agricultural or domestic use in rural areas, and also the cost of distribution is excessive. Therefore, the extensions in electrification can be promoted, with economic terms, only in the

[100] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943, p. 13.

context of intercity networks built to cover wider needs, referred to a whole region of rural communities. For example, irrigation by pumping is the most energy intensive activity with sharp peaks in consumption during the month of August, and throughout the summer, as it was proved by the agricultural use in Attica, according to tables quoted by the author.

Population density was inhibiting agricultural electrification, because agricultural wages were decreased and thus it was difficult for human labor force to contest electric power. On the other side, the population density was possible to act forwarding power consumption for household needs and to assist in establishing industries, because of the abundance of manpower. The conclusion, hence, may be that the density of the rural population gradually promotes rural electrification, in rural houses or crafts or industry, but not the agricultural electrification, in the field. The only exception is pumping for irrigation, which is imposed and promoted by the density of the working population.

In that period, around 1,000,000 oxen, cows, buffaloes, horses, mules and donkeys were still used to produce energy for plowing, transport and others. At the same time, there were also 1328 private tractors and motor ploughs, 160 public tractors and motor ploughs, approximately 10,000 pump engines, 6,000 windmills and 4,000 water wheels in agricultural industries. In the villages electricity was used almost exclusively for lighting.

The advantages of electric lighting, as succinctly summarized by the author,[101] was the ease of use, hygiene (lack of production of carbonic acid), cleanliness, minimal maintenance, fire safety; moreover, electricity is the least expensive means of generating energy.

The expansion of electricity will make life easy and pleasant, will allow the pumping of water for cleaning the house, bring radios, refrigerators, electric cookers, electric irons, etc. in the village; thus, the farmhouses will no longer use dry manure (dung) for cooking, as it was still done in many of the 10,680 villages that lacked electricity, e.g. in Thessaly. The food was usually uncooked even noon (olives, onions, etc.), while baked or hot food was usually available only at night.

With the dissemination of radio and cinema, entertainment and education would develop. Moreover, as it was 'in all civilized states', the cinema and the radio would be used in agricultural education. Rural electrification would also promote rural transport. The car and the truck could carry fruits, dairy products and vegetables from the village, from production to consumption. The author[102] did not hesitate to propose also aerial railways, as existed in some industries. Small electric trains, overhead wagons, trams and trolleybuses might economically replace the car.

But the most important is that electrification would enable the construction and exploitation of mountainous and rough lines, allowing the exploitation of forests, connecting inaccessible villages,

[101] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943.
[102] Ibid.

allowing the economic transfer of large masses (wood, grass, fruits, etc.). Finally, electrification would cause movement of the urban population for recreation and vacations, and therefore the resources of many mountain villages would increase.

One may also study the possibility of combining hydraulic projects in Greece with the construction of dams, regulation of rivers, irrigation, etc. The advantages of irrigation and drainage would be great for rural society; equally important would be fertigation of soil by the sludge of flooded rivers or the use of water from culverts. The flood defenses prevent fertigation but only in a few locations, such as Amphissa and Chalkida, the lack was remedied by systematic fertigation.

In the second part of his book[103] the author examined, inter alia, the domestic use of electricity in rural areas. The homestead was even then “gathering place of other rooms and apartments around the focus of the kitchen, located as close as possible to it, which is the center of the housework, even in rural life”.[104]

Nevertheless, the electrification will tend to decentralize apartments and works, particularly in larger farms. In addition, thanks to electric lifts, a change will occur in the architecture of rural houses. The stores could become bright and some parts of the rural house could be eliminated (vine presses, hold, etc.).

[103] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943.
[104] Ibid., p. 70.

Household appliances (laundry, ironing, fan, small heaters, boilers, motors, sewing machines, etc.) could be introduced to facilitate and enrich everyday life in the rural home.

Before electricity, the energy expenses were unprofitable for the farmer. The agricultural use of electricity would be effective in many tasks such as plowing, threshing, irrigation, the grass-pressing machines, fruit processing in the warehouse, sterilization, cutting feed for animals, keeping hot water in cow houses, shearing sheep, refrigerators, etc. The mills, dairies, olive-oil mills, wineries, canneries, lumber industries, textiles, carpentry, looms and many other industries and crafts in countryside would operate more economically with electricity.

The third part of the book[105] concerned the role of the state in conducting studies, granting loans and subsidies, establishing public power utilities etc. In countries such as the U.S., the central government helped the local community and the cooperatives, but also in Italy, Netherlands, Denmark, Bulgaria etc., the state favored the community or cooperative initiatives to establish local thermal electricity generating companies. In the USSR also, throughout the region Dnepropetrovsk, there was a project of extensive electrified agriculture. Nevertheless, with reference to the expenditures, the construction costs are generally exorbitant, relative to consumption, which appeared too high only during the summer. Thus, the developers had to find ways to balance this difference.

[105] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943.

6. *The communion of the peasants to the electrical facilities*

Evelpidis wrote upon rural electrification in 1943, in the midst of the horrors of the World War II. Thus, he observed that he could neither give sufficient information, nor it was possible to make reliable predictions about the extent of reconstruction needed, nor for the conditions of all required works.

During the interwar period everybody was convinced of the superiority of electricity. The effort to reduce the price of electricity and the development of new application modules of electricity had to be priorities, because consumption depends on prices, while the prices depend on the electricity use coefficient.

An obstacle to the development of electrical networks had been the difficulty in extending the use of machinery. The machines were useful for only a few hours each year on each farm and the benefits were limited by the need to pay amortization.

One of the most important problems of rural electrification was the difficult and uneconomical use of small waterfalls to produce electricity. The price, quality and security of electricity from small hydro were unprofitable in comparison to large distribution companies.

Despite the adverse conditions, Evelpidis uses the term “communion” (“symmethexis”) to describe the initiation of the majority of the inhabitants of rural Greece to the goods of civilization. The communion with electrical facilities passed through the introduction of various applications of electric power and above all

electric pumps for irrigation. The questions raised by the Greek agriculturalist referred to the rational use of energy flows in the country, altogether with safety, health, comfort.

A new era opened up in agriculture by introducing the use of the internal combustion engine. The internal combustion engine replaced the age-old farming methods for threshing and pumping, rendering much easier tasks requiring movement. The need to supply the village and the farm with all forms of energy can only be met by electricity that is easily converted into mechanical, chemical, magnetic, thermal energy.

The insistence of the author to highlight the docile and flexible nature of electricity was interspersed with eloquent comparisons, illustrating the extensive diversification that characterized both electricity and agriculture, “showing thus that electricity is made for the farms and for agricultural products".[106] The electric motor had proved, from various respects, its undeniable superiority on account of easy activation and steering, thrifty price and maintenance; adaptability to various uses, of agricultural and domestic nature.

The internal combustion engines could be used in mobile working machines, transportation cars, tractors and, finally, in electrifying populated areas. The author[107] listed all the benefits of electric motor: To start up is simple and instantaneous, and can be made from all the staff of the farm.

[106] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943, p. 12.
[107] Ibid.

The engines, either low or high power, are activated by the use of a switch. There is no risk that the engine moves backwards. It functions with equal ease at all times, even with the very low temperature.

Whatever work required, the electric motor automatically adjusts the power absorbed. In contrast, in thermal engines the factory owner is obliged to resort to complicated adjustments to modify the function, depending on the load.

The electric motor is flexible and withstands abrupt loads that may reach in a few moments twice the normal force. It is also resistant to extensive additional charges. It consume only in the necessary time of useful work, because one does not hesitate to use the switch to stop the machine or tool that moves.

The electric motor is quiet, small and occupies any position and can be moved from place to place, depending on the engine that will be connected. Lastly, the purchase does not cost relatively expensive and the duration is almost unlimited. The maintenance is minimal, because the damage is minimal; on the contrary, thermal engines require frequent controls of their condition and repairs. The expenses and the large depreciation and maintenance charges of thermal engines make them unprofitable, since allocated on short times, in relation to the nominal power of the motor.

7. *The Problem of Agricultural Capitals and Innovation*

Agricultural funds may be classified in the following categories: The Land Capital or capitalized land rent (land, improvements, plantations, forests, pastures). The Buildings Capital (buildings and other housing constructions), e.g. the farm house is an integral part of the production. The Livestock Capital (working and production animals, as well as growing animals). The Machines and Tools Capital. The Circulating Capital (annual demands for money). The Savings Capital.

The aforementioned classification essentially divides funds into fixed and circulatory (raw materials, wages, annual charges), according to their relationship with the productive cycle. But Capital may produce, may give rise to new value only within the production functions, with human work, and only with it. All that changes within the production process is the value of human work. While the fixed capital and raw materials are fixed values, they worth what they cost.[108]

Before the 2nd World War, according to Evelpidis' calculations,[109] the Fixed Capitals in agriculture were 6 times bigger than in industry, the Circulating were 10 times larger, the Total 7.5 times larger. However, agricultural production was only 3.2 times greater than the industrial. The difference was due to the exceptional state support to the industry, especially with duties, but also to the higher productivity in industry.

[108] Sakantanis K. "The problem of agricultural funds in Greece", *Antaeus,* 2nd Year, 1945.
[109] *Theory and Practice of Agricultural Policy*.

The feudal relic of absolute land rent (e.g. pastures) is completely uneconomic for the national economy because, with no productive reason, removes a significant proportion of production and lets it out of the production function. In 1945, the 31.3% of the total land capital belonged to the large property. The amount of land rent which was deducted, for no-productive purposes, from the value of the total agricultural production amounted to 3 billion drachmas. For this reason, Sakantanis supports that any direction of funds towards buying land is a counterproductive investment. The actual land capital is capital investment in the land.

The opposite outcome is possible by differential rent, either as a difference in fertility (e.g. tobacco farms, fertile fields), or as a difference in distance (from transportation, consumption centers, etc.) or as difference in materialized placement of human labor, i.e. irrigation, fertilization, etc. (e.g. sprinklers, nurseries, greenhouses, etc.).

The last form of differential rent, i.e. *innovation*, is the most advanced. In 1945, the relation between differential and absolute rent was calculated by Sakantanis[110] as D.R./A.R. = 1.8.

The large percentage represented by the abode in the total Building Capital may be regarded as an indicator of production delay. On account of this, Evelpidis[111] did not consider homestead as productive capital, therefore, he counted the agricultural buildings and facilities Capital to the amount of 3 billion drachmas in 1936.

[110] Sakantanis K. "The problem of agricultural funds in Greece", *Antaeus,* 2nd Year, 1945.
[111] *Theory and Practice of Agricultural Policy,* v. I , p. 186.

Furthermore, in underdeveloped countries, the prevalence of pastoral system and the lack of mechanization in agriculture are always followed by a large number of working animals. The production value of livestock in those countries is small, since their biological composition must be adapted to the extensive nature of the economy. The existence of a large number of working animals shows not only the extent of delay in the rural economy, but also encumbers the economic results without any economic reason. Thus, whenever small property prevents the rational restriction of working animals, 'the couple eats the bread of the family'.

But the composition also of the class of productive animals demonstrates the extensive nature of an underdeveloped rural economy, by the predominance of small animals (sheep, goats) against the big ones: an uneconomical option that indicates the productive delay of the country.

In 1945, Sakantanis observed that for the cultivation of 2.5 million hectares of farm land in Greece, 16,000 motor ploughs or 500-750,000 HP were needed. The Machines and Tools Capital was in 1939 only 4.5 billion drachmas, an amount equal to 1.6% of total agricultural capital. This ratio clearly reveals the delay in agricultural equipment and the prevalence of the manual production.[112]

[112] Sakantanis K. Ibid.

Resistance and Rebellion in the Greek Countryside

1. *Agricultural landscapes and technology*

During the long process of modernization in the Greek countryside, the introduction of four quasi-urbanizing technologies (electricity, telephone, radio, automobile) was propagated at time-points of bending or changing material conditions. Subject and scope of technology applications were the peasant communities and the residents of suburban centers, which produce the conditions within the immanent landscape of land.

The innovative appearances of technology in rural countryside were implemented through human action, which intervenes in the status quo of spatial reality. Innovation scans everyday circumstances and dissolves them, regardless the Unity of the Community of the village, which cannot any time assimilate technology.

In the beginning of the 20th century, the impromptu degradation of the Greek naval, commercial and agrarian web in the cities and in the countryside of Asia Minor, in the eastern Mediterranean, the Black Sea and Eastern Thrace, distorted and hampered the economic activity of the people. The military technology had enabled a radical migration into the present Greek territory. A large part of the refugees went to the countryside. The bad Strife (Eris), described by Hesiod, was finally transformed into good dispute and emulation between refugees and natives, who worked together for the industrial development and expansion of agricultural production.

In 1929-32, however, the international stock exchange capital interrupted again violently the development process of the productive forces in the country, reversing the course, creating thus underdevelopment. During the war that followed, the mineral wealth of the country was plundered, the productive structures were destroyed, the reserve stocks were seized, thousands died fighting, while a minority of Nazi-squealers gathered properties. The burned villages altered the Greek landscape. The thousands of displaced villagers, the exiled, and the political refugees deprived of their land, the dead of the Civil War were buried in the bloody earth. By the end of the war, work in the fields turned again to its cyclical rhythm. The loads of reconstruction programs and the appeals of local communities for help are essential sources for the historical research on the After-Civil-War period in the countryside.

Thereafter, the chaotic development of Athens became a “guide and disharmony example for the entire country” and broke all relations “with the Greek tradition of reason and moderation”.[113] The unregulated, scattered and arbitrary construct does not compute “the lines of hills, the elements of the traditional and the natural environment” and conceals or eliminates the beautiful beaches, the lines of the horizon, etc. Tourism downgrades landscapes and alters the aesthetics of space, “converting the unique Greek environment, to a field of marketing and enrichment activities”.[114]

---

[113] Proveleggios, A. *Speech in the meeting of the Landscape and Cities Committee,* in the Technical Chamber of Greece Hall, September 1956, p. 23. Cited by Kapetanios, A.V. *Landscape Architects, come quickly to this land... The miracle called Greek Landscape!* Athens: Filippoti, 2009.

[114] Kapetanios, A.V. *Landscape Architects, come quickly to this land... The miracle called Greek Landscape!* Athens: Filippoti, 2009, pp. 31-32.

The urban Mediterranean landscape, as Kapetanios[115] argues, is destroyed by the concentration of various uses (housing, financial activities, commercial transport etc.) in the urban web, with the result of "fragmentation and ultimately congestion". Many times, this is combined "with illegal construction and appearance of arbitrary settlements, in the form of slums, making thus the situation even more tragic, as aesthetically and functionally unacceptable".[116]

Nevertheless, there is another Greece, the countryside, "where creation is not substituted by recovery". The biggest threat against this land was the Nazi occupation between 1941 and 1944.

1.1. *Ziaka in Grevena*

The farmers in their recent history have shown that they are not only agents in the historical process, but they can also act with historical consciousness, as Riki Van Boeschoten contends.[117] The rebels were singing that they were not subservient, nor fatalists. They were fighting for the rights and the victory of the entire people.

Ziaka, in the mountainous prefecture of Grevena, was named after Theodore Ziakas, the leader of the revolution in 1856. During the 19th century, the village had a subsistence economy, with a low degree of market integration and high dependence on nature. Later, in the interwar period, the village was incorporated in the market "but the low productivity and the lack of transport prevented villagers

[115] Kapetanios, A.V. *Landscape Architects, come quickly to this land...* Ibid.
[116] Ibid., p. 37.
[117] Van Boeschoten, Riki. "The Farmers and the CPG. Popular Communism in the period of Resistance and Civil War". *Ta Istorika,* 21, December 1974.

benefiting from this fact: they were buying, but the possibilities to sell were limited".[118] Nevertheless, in the 1940s the same community became known as 'Little Moscow'. "They had 80 victims, most of whom, were killed in the Civil War on the side of the Democratic Army".[119]

The residents of Ziaka were distinguished for their social cohesion and practical economic cooperation. "We are a herding village; we do everything together. We prefer group-life; we enter easily into these molds". The homogeneity of interests and the mobility characterize the regular rhythms of village life.

In the interwar period, although in Ziaka there was dissatisfaction with the contemptuous attitude of the officials who came from Southern Greece and the economic oppression by the state, the creation of the Agricultural Bank in the 1920s gave birth to hope. But the liberal bourgeois party of the Prime Minister Venizelos betrayed quickly any expectation, hence, the majority of the residents converted, during the elections of 1928 and 1933, to the Agrarian Party. Thanos Feidas, born in Ziaka, became a member of the national leadership of the Agrarian Party.

Since 1933, there was an organization of the Communist Party in the village, and later the progressive teachers of the village, who had studied at the Teachers College in Kastoria, pioneered in EAM. In March 1943, Grevena was liberated and the resistance group of Ziaka joined EAM. The Communist Party began to play a leading

[118] Van Boeschoten, Riki. "The Farmers and the CPG. Popular Communism in the period of Resistance and Civil War". Ibid. p. 367.
[119] Ibid.

role in the village. The experiences of farmers in the Civil War and the imprisonment of their villager Captain Chimaros in Romania, in 1955, marked the lives of the residents.

2. *Destruction, predatory accumulation*

The aim of the occupied economy imposed by Nazis to Greece was the maximum appropriation and use of the strategic resources of the country and its productive capacity. From mid-May 1941, the Nazi occupation army seized all available essential commodities and industrial products; they secured long-term supply of all key *raw materials* and *agricultural commodities*.

They took control of most mines and industries, such as Lokris Nickel (ores of which were shared between Krupp and Azienda Minerali Metallici Italiani), the Bauxite in Delphi, the Bauxite in Parnassus, and the Gunpowder Industry. Long-term agreements were concluded between Krupp and 26 Greek companies. The occupying forces targeted an annual exploitation ranging to 616,300 tons of precious metals.[120]

German companies used various methods to enter in important sectors of Greek economy: confiscation, compelled sale or rent of companies, seizing shares and forced extension of the German capital in Greek companies, taking control of foreign shares and transferring legitimate Jewish property to non-Jews (“aryanization” of the companies).

[120] Etmektsoglou, G. “Greek Economy during German Occupation”. In *History of the Greek Nation,* Volume 16 (2nd Edition). Athens: Athens Publishing, 2008.

There was little resistance by the Greek state and local entrepreneurial class to the Nazis' approaches. The acceptance of a Nazi contract guaranteed the *distribution of raw materials and fuels* and, in some cases, *massive profits*.

Approximately 6,500 new enterprises were established during the German occupation, a sign that along with the destruction of traditional properties, a new class of *nouveau riche* appeared as an economic power. The properties were exchanged with amounts accounted for 5% of the prewar value, through the black market. In March 1943, in Thessaloniki, around 1,700 companies owned by Greek Jews were closed, although 500 of them had a contract with the Reich. Immediately after that, Greeks, chosen by a committee appointed by the 'General Governor' of Macedonia, Basil Symeonidis, decided to take the 'aryanized' businesses.[121]

One of the main causes of hunger in the winter of 1941-1942 was the assignment to the Bulgarian occupation authority, of the biggest part of the granary of Macedonia and Thrace, which in 1938 produced 21,15% of the total grain in the country. Moreover, the seizure of stored supplies and harvest infuriated the small bakers, who raised their prices. Big profits were brought in the black market by the shift of the tobacco producers to the growing of potatoes, corn, cereals and vegetables.

Compelled collection failed because the occupation government was unable to enforce it, especially since the owners of the means of production were more and more *speculating* due to the very high

[121] Etmektsoglou, G. "Axis Exploitation of Wartime Greece". Atlanta: Emory University, 1995.

inflation and the opportunities to profiteer. But by the spring of 1943, two-thirds of operating mines were closed due to the action of the rebels.[122]

According to the authorities of the Ministry of Finance sixteen categories of firms had made huge profits from April 1941 onwards. Those companies were public works contractors, construction companies, banks, shipwreck collection companies, import companies, tobacco industry, cotton industry, wineries, leather industries, oil processing, food producers.[123] The first pillar of Varvaresos' policy, as Deputy Prime and Minister of Supply in Voulgaris government, after 2 June 1945, was the taxation of those who became rich during the occupation.

2.1. *Public affairs after 1941*

1941 was a milestone in Modern Greek history, because in that year the financing of the Greek economy by immigrant remittances was temporarily stopped.[124] Thus, the occupation brought the people of the country to the brink of deprivation, when in winter 1941-42 thousands died of starvation in the streets of Athens and other cities. Thereafter, the Swedish Red Cross (with the approval of the Allies and Axis) supplied with wheat Athens and other cities.

[122] Etmektsoglou, G. "Axis Exploitation of Wartime Greece". Ibid.
[123] Sfikas, T. *The British Labours and the Greek Civil War. The Imperialism of 'Non-Intervention'*. Athens: Filistor, 1997.
[124] McNeill William H., *The Metamorphosis of Greece since World War II*. Chicago and London: The University of Chicago Press, 1978, p. 53.

This critical situation caused the birth of the Greek Resistance movement EAM – ELAS (National Liberation Front – National Popular Liberation Army). The interpretation proposed by McNeill was based on the lack of food, which made vain the spring migration of the unmarried sons of mountain families. In the early 1942, the EAM grab this opportunity actively and decisively.

As McNeill recounts, he visited, in 1946, two rebel groups, who had recruited their members from villages in the mountains. The rebels had the same incentives which pushed all villages to participate in the resistance. In 1942, the rebels fought with the German, Italian and Bulgarian occupying forces to control the shrinking food surpluses produced in the villages of the plains. Until 1944, the resistance had clearly won the fight in the countryside, while Athens and other cities depended increasingly from food imported by the Swedish Red Cross. Supplies from the rural hinterland barely arrived in the cities anymore. The political and military control of lowland villages had passed into the hands of EAM, apart from those in the immediate vicinity of Athens. Another way to describe the occupation of the plains by the rebels would be to say that the mountainous consumers, descended armed to the plains in search of food they needed to survive, while the inhabitants of the city, fed by overseas supplies, remained in situ, increasingly disconnected from the Greek mainland. The entire people's antifascist struggle is thus presented by McNeill,[125] with a completely unhistorical explanation, as an equivalent, widespread political violence.

[125] *The Metamorphosis of Greece since World War II*. Chicago and London: The University of Chicago Press, 1978, p. 68.

In the spring of 1942 there were local leaders and EAM organizations across the whole of central Greece. Thousands of young people joined the organization, after a recommendation by the local Manager of EAM in the village or in the city. As calculated, in 1946, by McNeill,[126] the influence of EAM was greater among youth and women. In the cities, there was a first collapse of the system of values and the discipline of peasant society, which until recently dominated among the urban working classes. In the village it was not the same, because the traditional values were still strong.

According McNeill's reflections in 1978,[127] the EAM was born and grew on the mountainous areas. In 1946, however, McNeill[128] expressed a different opinion, assuming that the EAM had gained a greater influence in the cities, while its strength was less in the countryside. In reality, the focus of the EAM power was gradually moved from the mountains to the cities. Only the Bulgarian army had achieved to avert the resistance movement from the recapture of the conquered territories of Thrace. Across the country, except of Thrace, according to the author, only large cities remained in the hands of the occupation authorities.

The question, on regard of EAM, was to complete the ascent to power by the conquest of the cities, with the suppression of 'collaborators' and other corrupted elements of the society, without sacrificing access to food and other supplies, offered by the Allies, necessary for the survival of the cities. The suspended part of the

[126] McNeill William H. *The Greek Dilemma, War and Aftermath.* Victor Gollancz Ltd, 1947, pp. 64-65.
[127] *The Metamorphosis of Greece since World War II.* Chicago and London: The University of Chicago Press, 1978.
[128] *The Greek Dilemma, War and Aftermath.* Victor Gollancz Ltd, 1947, pp. 64-65.

population was the peasants of the plains, dissatisfied by the supply of food for the rebellion, because they considered it arbitrary. Apparently, the villagers of the plains behaved externally with submissiveness, but in their hearts they felt disgust for the rebellion.

In these circumstances, the policy of those who controlled the delivery of food and other supplies to the cities from abroad, was decisively important. This function was transferred later to the British armed forces, with only token American participation.

The official British policy wobbled, during the war, between supporting EAM - ELAS and cooperating with bourgeois elites, which were attacked by the insurgent rebels. Churchill, undertaking to handle personally the situation, strongly supported King George II. In early May 1944, the British and the Russians, allegedly, agreed to find a tentative definition of spheres of influence in the Balkans, according to which Greece was attributed to British supervision.[129]

In the Conference of Lebanon, in late May 1945, five seats of the exiled government were attributed to EAM, ¼ of the total. The EAM was invited to designate the persons who would occupy the seats. The positions remained vacant until September, when five people were secretly flown from Greece to Egypt and sworn in as ministers. This fragile formation was the government which returned to Greece, in October 1944, when the German army had withdrawn from Athens.

[129] McNeill William H. *The Metamorphosis of Greece since World War II.* Chicago and London: The University of Chicago Press, 1978, p. 68.

In the conflict that followed, the supporters of Papandreou were the police and the administrative services in Greece, a low number of British troops, and a brigade that was coming from the front, after it was cleared from rebellious elements. The resistance forces of EDES were very fragile, while in December 1944 collapsed within a few days.

A key-point to that situation was an agreement made between the Greek government and the Headquarters of Allied Powers in Caserta, Italy. It was then decided that the top management of all Greek armed forces passed to the control of a British General named Ronald Scobie. With the agreement of Caserta theoretically ELAS came under Allies' command.

"The hollowness of the agreement"[130] became obvious when, after pressure by the British, the Greek Government decided that ELAS should be dissolved and disarmed. Reacting to this decision, on the night of 1-2 December 1944, the ministers of ELAS withdrew. The resignation caused, two days later, a large demonstration in the central square of Athens. The police opened fire and killed or wounded more than a dozen of protesters. In the turmoil that followed all the props of Papandreou's power collapsed. The leaders of EAM organized attacks to police stations and government buildings.

Shortly before the outbreak of the attacks, British troops were placed in government buildings. The plan of ELAS did not provided for conflicts with the British. But the RAF, once ordered to attack the

[130] McNeill William H. *The Metamorphosis of Greece since World War II.* Ibid., p. 74.

strong positions of ELAS in the city, the ban was lifted, and in the heart of Athens fierce battles started, which continued for five whole weeks. ELAS could not prevail, because simultaneously they collided with EDES in Epirus, while the British were supported, after December the 6th, by the Greek Mountain Brigade, which camped in Goudi barracks.

With the arrival of experienced British troops that came from Italy, the victory leaned to the side of the British. Thus, in February 1945, the Varkiza agreement was signed in, according to which about sixty thousand men of ELAS turned in their weapons. In many communities, however, far-right violence appeared, and yet, the gendarmerie - as McNeill stresses - faced ELAS with an unhealthy suspicion ("virulent distrust").[131] The army was also dominated by supporters of Metaxas, whereas those who were evicted after the failed coup of 1935 - which later participated in ELAS - they had not been admitted again.

Thus, in the period from February 1945 to March 1946, there has been a sharp reversal of the political balance in Greece. Conservatives gained ground. However, as pointed out by McNeill, if the elections had been made while the ELAS controlled the countryside, there is no doubt that the same peasant common sense that gave the victory to the royal parties, in March 1946, could have been driven to the left.

[131] McNeill William H. *The Metamorphosis of Greece since World War II.* Chicago and London: The University of Chicago Press, 1978, p. 77.

Furthermore, in September 1946, a referendum was organized to restore the monarchy, in which the monarchists gained 69%, because the left had urged voters to refrain.

The war led Greece in great poverty. The tax revenues fell far short of the expenses, while inflation was galloping. Irrefutable sign of the economic crisis was the recovery of guerrilla action in the midsummer of 1946, in many parts of Greece. The veterans of ELAS, who had temporarily subsided in Yugoslavia - appearing only in the villages where they were coming from - gathered around their younger siblings and other relatives, which in a night would pass into armed struggle.

On 15 October 1946, William McNeill points out in the preface of his book *The Greek Dilemma, War and Aftermath*, that he writes as a hearsay witness, that lived in Greece twenty months (from November 1944 to July 1946), watching a conflict, during which the Russians have backed the Left morally; while the British have supported the Right with arms and, in partnership with the United States, also financially.

In early 1947, the new Labour government in England decided to stop financial aid to the Greek government and the Greek armed forces. Thus, the Greek leaders fled to the U.S. After a few weeks of hasty consultations, President Harry Truman decided in March to push Congress to take on the role of Britain, supplying Greece with enough money to restart production and stop the communist onslaught. By July 1947, the Greek communists, avoiding to contribute to Tito's politics for an "Aegean Macedonia", did not

provoke ultimate rupture, while constraining the new rebel groups from active action. They also dealt with Themistocles Sofoulis their participation in government, without success. In July 1947, the American Aid Mission began arriving, whereas the first ships of the Truman program came in August, and the integrated program began in 1948. The newspapers of the Communist Party were appearing in Athens until October, when again it was declared as an illegal party. Then broke up the tough final clash, which made the economic aspect of the American plan for Greece inapplicable.

As the author argues, the biggest part of the American economic blueprint for Greece concerned building a national electrical grid, based on new hydroelectric power plants and some plants burning lignite.[132] The problem was that the areas where the hydropower could be bound, were the mountains where the rebels had fled. Long-term projects such as electrification had to wait. The Americans were also reluctant to convert their economic assistance to military. Investment, however, in ports and roads, trucks and communications, could obviously be used both for military and economic purposes.

In June 1947, the Marshall Plan was proposed, which was accepted by the Congress in December. Under the Marshall Plan, the European Reconstruction Plan was organized, which was to last until 1952. The Marshall Plan was extended to Greece in April 1948.

[132] McNeill William H. *The Metamorphosis of Greece since World War II.* Chicago and London: The University of Chicago Press, 1978, p. 86.

However, as pointed out by McNeill,[133] the Greek government was absolutely unable to proceed to the economic and social planning, as it was determined by the incentives of the Marshall Plan in countries like Britain, France, or Italy.

The failures of the Greek government in management and the heavy cost of the war, made economic reconstruction impossible. The most effective means found by the Greek government to eliminate the spread of the influence of communist groups, was to move the peasants away from the villages that were within the range of the rebel raids. Thus, the government deprived the insurgents of bases, supplies and information. By the end of the war 700,000 villagers, one-tenth of the country's population, were living in refugee camps on the outskirts of some cities. Thus, in 1948 the National Army attacked Grammos Mountain, for a bloody battle.

In June 1948, came into light the Tito - Stalin controversy, posing a dilemma to the Greek communists. Eventually, the Communist Party turned against Tito, who retaliated by closing the border to the rebels of the Democratic Army. Suddenly, on March 1, 1949, “Radio Free Greece” began broadcasting in Romania, inciting for an independent Macedonia. But, shortly after, when the attack of the National Army broke up, the fighters of the Democratic Army were defeated. On October 16, 1949, the radio of the Communist Party conceded defeat.

[133] McNeill William H. *The Metamorphosis of Greece since World War II.* Ibid., p. 87.

3. *The civil war and its aftermath, 1947-50*

The six Greek villages that McNeill visited, after 1945, as a member of *American Aid*, were neither typical statistical examples, nor representative sample of the Greek countryside. None of those villages fueled migration to Germany, during the 1960s, while other nearby communities emptied at the same time. They survived in the depressive and seemingly unresolved difficulties of 1947, and the course of the next years was characterized by McNeill as a 'success story'.

The choice to visit these particular villages was, however, random. In early 1947, the *Twentieth Century Fund* sent a team of three people in Greece with the hope to inform the American public opinion about the expected debate on aid to Greece.

The team's findings were issued under the title: *Report on the Greeks: findings of a Twentieth Century Fund team which surveyed conditions in Greece in 1947*.[134] At that period the guerrilla movement was spreading rapidly in the mountain regions of Greece.

The central aim of the group of Americans was to listen to both sides, hence, they found ways of accessing villages known as rebel bases. Kerasia and Cotta communities, were examples of mountain villages, as noted by McNeill, which due to the scarcity of food, joined the ranks of the rebels.

[134] Frank Smothers, William Hardy McNeill, Elizabeth Darbishire McNeill. *Report on the Greeks: findings of a Twentieth Century Fund team which surveyed conditions in Greece in 1947*. New York: Twentieth Century Fund, 1948.

Access was easier to villages in the plains. The team visited, in 1947, Ancient Corinth and New Eleftherochori (later renamed Methoni).

In 1956, McNeill visited again the four villages mentioned above, with the intention to write a book about the results of the U.S. assistance programs, issued a year later, with the title *Greece: American Aid in Action, 1947-56*.[135]

That research was a review of the first ten years of implementation of programs for the Greek countryside. McNeill's research was based on a conceptual distinction between villages with food surpluses and villages with food shortages. The author also made comparisons of lowland and mountain villages.

In 1947 the market system in the Greek countryside was destroyed. Fertilizers and spare parts were hard to find for years. The vehicles were completely disappeared, and the beasts of burden had become rare. Since the years of occupation 'violent' or 'about violent' requisitions were becoming often in lowland villages, usually irregular and 'discriminatory', and between neighbors.

Therefore, as the writer stresses, the village life and productivity reached a very low ebb. Sufficient food was precarious even in the lowlands, and families hid their supplies, until the next harvest.

[135] William H. McNeill, *Greece: American Aid in Action, 1947-56,* Twentieth Century Fund, New York, 1957.

3.1. *At the foot of Mount Olympus*

New Eleftherochori in Macedonia suffered all these problems in the winter of 1947, when McNeill visited it for the first time. The village is located in a fertile, downward landscape at the foot of Mount Olympus, just over Thermaikos Gulf, about fifty miles away, in a straight line, from the port of Thessaloniki. The renaming of the village came from the adjacent ancient Methoni. Before 1912, the area of the community had been occupied and exploited by Turks. However, under Greek control, the village was settled by lumberjacks and carpenters from the mountain villages Eleftherochori and Katopigi, located on the slopes of the mountains. The land was not completely cultivated, because many were mobilized immediately after liberation. There was also a problem with malaria, and difficulty in collecting plows, working animals, and seeds. In 1927 the land was divided by landscapers into 2.7-hectares parcels, each one assigned to a family.

The distribution of land included not only local but also several refugee families from Pontus (Black Sea). Since then, both groups maintained a certain distance between them, especially in marriage relationships. The small area of land compelled farmers to self-consumption, while resorting to trade only for the purchase of clothes, tools and other necessary for embellishment of life. Nevertheless, the population of the village doubled in twenty years, from 450 in 1927 to 812 in 1947, creating a deadlock on the issue of division of the parental lot. Therefore, many children growing up in large families were forced to migrate.

During the war, however, the economic disorganization made it impossible to find work in the cities. Therefore, EAM - ELAS offered a satisfactory alternative, followed by twenty young men from New Eleftherochori, according to McNeill's historical explanation.[136]

In 1947, during his first visit, McNeill realized that food was scarce, and that the villagers ate secretly, fearing requisitions by the two warring sides. In the evenings, armed men were patrolling the village, watching over the known leftist or those suspected. In the police station, located at the edge of the village, the gendarmes were awake and nervous.

A few days before the arrival of the group of Americans, a rebel group had plundered the storehouse of UNRRA that was installed in the village. The raiders left with a few loaded mules. The remaining supplies were carefully hidden by the villagers, as the gendarmerie was chasing the insurgents.

Around fifteen residents of the village were arrested after the raid. They were suspected of collaborating with the guerrillas. One of the hostages was executed. A cold silence gripped the village every night. The fear was ever present. Nobody saw a way out of the trap that had been created by the presence of many children in a small piece of land.

McNeill remembered how bitterly a man, who introduced himself as the best farmer in the village, explained that he had tried fertilizers before the war and found that they actually increase the

[136] *The Metamorphosis of Greece since World War II*. Chicago and London: The University of Chicago Press, 1978.

yields of wheat from his land. But after selling that harvest, the interests on his loans had to be paid; thus, the debt of the loan he had taken for the fertilizer eliminated any gain. Only in years when the weather was fair, the farmer could have a small profit. In a bad or mediocre year, the farmers were getting poorer. Finally, because the risk was excessive, the farmer was forced to quit fertilizers.

At this point, with a slowdown in the course of storytelling, McNeill brings to the fore some of his darkest thoughts: Such an experience meant that the intensification of agricultural production seemed as hopeless as finding a job in the city. There was no escape: the ancient brutality of hunger, famine and war seemed as the only way to adjust the population to the available resources, and nobody could accept this fate. Yet, in early 1947, the village seemed to be at the verge of gobbled up by just this kind of destruction.

The rebels returned once or twice in Eleftherohori. But the evacuation of this village was prevented, since the guerrilla group was forced to move to an area closer to the border. Afterwards, the young men of the village (except from the few already joined the rebels) were classified in the National Army.

When things calmed down, in 1950, a devout right-wing politician - the president of the community - asked the gendarmerie to liberate two children who had been arrested when dismissing from the guerrilla. He did this, although his son was killed in the war. And when the constabulary decided to set free both young men, political reconciliation amid the village was consummated effective and lasting.

Thus, cold despair gave way to new possibilities, as the easiest credit terms offered by the Agricultural Bank, which made the use of fertilizers more applicable, as McNeill supports. A bus offered transportation for children attending high school in Katerini. Secondary education could secure a white-collar job, but also a lot of hope for families with five or six children.

In 1956, McNeill repeated his visit and found that at least thirty-six boys from the village were attending the high school and some had already graduated. Among the graduates were some who had found work, while others, three to four, who continued looking for employment, were hoping that eventually they will find. But times have changed and a feeling of desolation emerged in the behavior of any young man who had chosen to attend secondary education in order to find work.

3.2. *Class interests* in *Ancient Corinth*

The second lowland village that McNeill visited in 1947 was Ancient Corinth. The village is located right next to the dominant mountainous Acrocorinth. Ancient Corinth lost its commercial importance from 1893 onwards, when the reorganization of transports after the opening of the local Canal, favored its adjacent town of New Corinth. Instead, Ancient Corinth could not overcome the size of a village, with a population of 1,530 inhabitants in 1947.

The most populous class of the village was farmers consuming their own harvest. The exception was a farmer who owned 20 hectares. Others who had 2.5 hectares remained in the level of

subsistence. About one-fifth of families had from 1 to 2.5 hectares of land, while another fifth had less than 1 hectare. There were also a hundred families deprived completely of agrarian property, working as waged laborers in the farms, or in the archaeological excavations organized by Americans there.[137]

It may seem strange that farmers with 0.6 hectares land were considered as self-sufficient, but it was true. Since the 17th century, raisins were the main marketable crop. The raising growing requires intensive labor to such an extent, that an estate of over 0.4 - 0.6 hectares cannot be easily cultivated with only family work. Everyone having 2.5 hectares had to rent workers in growing, spraying or harvest seasons. The waged laborers in the village worked also in the two cooperatives that marketed raisin.

Until 1943, a more or less satisfactory market for currants maintained, because the Germans wanted raisins. In 1943, however, the transfer of raisins in distant markets had become impossible. The two cooperatives went bankrupt, but raisins' growing was continued.

The production yet fell, because the pesticide *'Paris green'* used by farmers was scarce. Commercial exploitation was displaced by barter. Several families were exchanging raisin with cereal or oil that was always imported into Ancient Corinth. The labor agreements were also concluded with non-monetary, replacement terms.

[137] McNeill William H. *The Metamorphosis of Greece since World War II.* Chicago and London: The University of Chicago Press, 1978, p. 146.

The decline in production and the cumbersome format of exchanges aggravated the economic situation. Uncertainty and concern about the adequacy of food were causing exacerbation of political competition within the community. Not at all inexplicable was the broad support that EAM garnered in families of employed workers in the village. Similarly, self-sufficient farmers, who dominated the life of the village by tradition, were attracted by the right-wing. The clash of class interests created a sharp political polarization, alike from New Eleftherohori.

During the last months of 1944 and in early 1945 a committee of EAM controlled the village and almost scared the landowners of the village, although the committee made no effort to redistribute land properties.

What was actually challenged by EAM was the traditional way in which the contracts were arranged through silent private negotiations. The concealment now was replaced by a public list for inviting in turn the available workers, regardless of any personal relationships. Employers were dissatisfied with this change, but anyway there was not much work to be done at the time. Until the overthrow of the EAM Committee, because of the December events in Athens, EAM made also attempts to collect olive-oil from those who could take it with them by leaving the village.

The personal relations between employers and workers were so diverse and friendly, that no sharpening of class struggle appeared in Ancient Corinth. Everyone knew methods to increase productivity, e.g. before the war thirty irrigation wells had been opened. All

residents thought that the production would increase by using fertilizers, tractors and irrigation. But in 1947 there was a shortage of spare parts and fuel for the pumps. Thus, the irrigation almost stopped.

There was a profound difference in class structure, as McNeill[138] notes, between Ancient Corinth and New Eleftherochori. The class stratification in Ancient Corinth had taken the form of a social hierarchy with very deep roots. In the village there were always rich and poor, but no structural crisis threatened the community by the plight of the poorest residents.

By contrast, in New Eleftherohori the plight of small farmers were referring, without exception, to the whole of the community, and the only variable was the number of children in each family. The fear of losing social status threatened all residents of the Macedonian Village.

The author suggests that this counterpoint between an entrenched hierarchical structure, such as in Ancient Corinth, and a fickle and unstable social structure, such as in New Eleftherochori, is a typical difference that exists between all lowland communities of 'Old Greece' and lowland communities of the Northern regions, incorporated to Greece from 1912 to 1918.

This difference is also valid between plains in Thessaly and 'Old Greece'. Both in Thessaly plains and in lowland Northern Greece, large-scale government interventions implemented land distribution,

[138] *The Metamorphosis of Greece since World War II*. Chicago and London: The University of Chicago Press, 1978.

based on egalitarian principles, which led to the normalization of social inequality in villages.[139] Obviously, the reforms towards land distribution impacted decisively on the northern plains communities, but have not had much importance in mountain communities. There, as in Ancient Corinth, the traditional rules of marriage and inheritance determine the distribution pattern of inheritance rights. The result was, respectively, the formation of a detailed hierarchy of wealth in Ancient Corinth, and the dominance of the layer of migrant workers in the mountainous villages.

3.3. *Kerasia in Pelion Mountain*

Kerasia, in Pelion, is located about six miles from Volos. It is built on the northern slopes of the mountain, where icy northern winds make olive cultivation impossible. The land is barren. The tiny parcels of land have thin topsoil and erode rapidly if cultivated. At the time of the Ottomans, Kerasia's villagers were shepherds, and despised the servile peasants of the plains. In winter the shepherds of Kerasia occupied a corner at the edge of the plain of Thessaly, in a place where a little river empties from a gully, providing sufficient water.

The sheep of Kerasia wintered in a land that belongs to the lowland village Kanalia. There were ongoing tensions between the two villages, because the sheep did not remain in desolate areas and in fallow farmlands, but tended to invade in the fields with the winter wheat, threatening a general destruction of the crop. The few lowlands belonging to the community of Kerasia were being shared

[139] McNeill William H. Ibid, pp. 149-150.

by three families since 1905. But there was no dispute about this land, since the life of the farmer is not at all attractive for the average resident of Kerasia.

After 1947, the way of life in the village changed. Since the interwar period, already, the profitability of sheep growing declined, because the residents of Kanalia began to abandon the regular two-year fallow. The casual labor, the tillage and the shift to the occupations of lumberjack and charcoal burner were the alternatives provided by the residents of Kerasia to the slack caused by fallow removal.

An ax, a shovel and a donkey to transport the charcoal to the market of Volos, was the capital necessary for the profession of charcoal burner. The charcoal was sold immediately in the city, and was used for cooking and heating. However, intensive logging caused erosion in soils of the mountain. Trees arose at a much slower pace, especially on the north slope of Mount Pelion. In late 1930 the residents of Kerasia were found again trapped in poverty.

The war years were difficult. Most inhabitants of Kerasia liked EAM and many worked for the resistance. Upper Kerasia suffered the consequences of war, in 1943, when the Nazis destroyed the village in retaliation for some act of violence against the occupying regime.

Upper Kerasia was the real homeland of the villagers, where they passed their summers, breathing the air of the mountains, grazing their sheep on the hills, and enjoying the freedom of the mountains.

The village that McNeill visited in 1947 was just a winter shelter. With the passage of time, the humiliating dependence from the landowners of the plains had become living condition. After the war, the Greek government banned the reconstruction of Upper Kerasia, and the first months of 1947, the military and police handed out an order saying that no one should be allowed to ascend the heights the next spring, despite the fact that there were the pastures and woodlands of the village. In late 1946, three veterans of ELAS, who came from Kerasia, had returned to the village to gather the villagers and to resume the armed struggle. They easily picked forty young people from Kerasia and villages with similar topographic position. The rebels took over the ruins of the village as a camp. Thus, while in the daylight Lower Kerasia was controlled by the contingent of the National Army based in Kanalia, during night it returned under control of rebels descended from the upper village. As it was expected, this situation destroyed the solidarity among the villagers.

Some weeks before the referendum in September 1946, a group of right-wing thugs had arrived in the village. They searched for EAM supporters, which they beat them and burned their houses. In March 1947, when the American mission visited the village, all the right-wing supporters had been removed either in Kanalia or in Volos, as McNeill argues. Few of those who remained in the village were willing to discuss and speak out openly in favor of the left. The leftists even admitted openly, as McNeill adds, that they had voted for the restoration of the king in the referendum, after the invasion of the far-right gung, not to have trouble.

The presence of rival military units within a walking distance from the village made life unbearable because it was impossible to settle permanently. The villagers struggled to survive, since the soldiers began to mistreat them every time they caught them cutting firewood from the mountain. A few weeks after the arrival of the American team in the village, the Greek army ordered the evacuation of Kerasia.

The villagers moved to a refugee camp on the outskirts of Volos, where they stayed until the end of the war. Thus, the guerrilla group was deprived of the supply base. Before the evacuation, in Lower Kerasia operated a hidden but effective committee to gather supplies for the rebels. As long as the system of requisitioning lasted, all had to reinforce the rebels. There was also the possibility of a family that lacked the necessary food to encourage their integration with the rebels.

Not all members of the guerrilla group were coming from Kerasia. The leader, with the nickname Captain Dimitrov, had arrived with a small entourage in Kerasia, in 1946, coming from Olympus. The guerrilla group acquired normal organization in Pelion and joined the Democratic Army only after the arrival of Captain Dimitrov.

In Upper Kerasia there was also a representative of the Communist Party: a high school graduate, propagandist and Marxist ideologue from Volos. The majority of the rebels came from Kerasia and the surrounding villages, while few had come from distant villages.

McNeill had found out, during his visit to the rebel's shelter, that meals were normal. This revealed the existence of an extensive network of supply, apart from Kerasia, mainly in lowland villages. The hidden supply network had been rested mainly on the plain, while Kerasia was rather a collection station.


Ἀθῆνα, Σάββατο 24 Μαΐου 1947

ΤΑ ΔΟΛΛΑΡΙΑ ΘΑ ΔΙΑΤΕΘΟΥΝ ΚΥΡΙΩΣ ΓΙΑ ΟΠΛΑ

ΔΗΛΩΣΕΙΣ ΤΟΥ κ. ΑΤΣΕΣΟΝ

ΘΑ ΦΥΓΟΥΝ ΟΙ ΑΓΓΛΟΙ;

ΟΥΑΣΙΓΚΤΩΝ, 23. ...

Η ΑΠΟΣΤΟΛΗ

ΘΑ ΦΥΓΟΥΝ ΟΙ ΑΓΓΛΟΙ;

ΟΙ ΣΤΡΑΤΙΩΤΙΚΟΙ

ΛΟΝΔΙΝΟ, 23. ...

Newspaper article during the Greek Civil War

Some other young people from Kerasia served in the National Army. They were fed with food supplied by the U.S. The number of Kerasia youths which were classified in the National Army was

about half the number of those who had joined the guerrilla group. Coincidences related to the classification and turn contributed eventually where joining each fighter.

In March 1947, the contingent of Army in Kanalia had a threefold or fourfold force than the rebels in Pelion. The soldiers, however, did not show any inclination to fight the rebels, and during each ascent to Pelion they tried in every way to warn the rebels for their arrival. In all these cases, shots were exchanged only once, but neither side had intended to kill.

The evacuation of Kerasia was decisive. After removal of residents from their homes, both Kerasia and other neighboring villages, the guerrilla group of Pelion withdrew to the north, because they lost their food supplies. Since then, young people who had joined the Democratic Army fled away.

In 1956, ten of them had returned to the village. Others had correspondence, or renewed contacts with some other way, while forty were missing. For this reason, the natural increase of the population of the village did not increase the actual population. Although statistics were inaccurate due to the evacuation of the village, the calculations showed that births were approximately forty-five more than the number of deaths.

The experience from the concentration camp was depressing. Many were those who envied those who, by any means, found a job in Volos, and did not return to the village when in 1950 the evacuation order was finally revoked. The village was then concentrated a miserable and disorganized population, politically

divided, but hostile to the state authorities which disrupted community life. The economic collapse made its appearance again, as before the war. The official programs for improving the use of resources of the village were “undermined” by its residents, and Kerasia remained an angry and potentially revolutionary community.

3.4. *Comparisons between villages*

In 1947, McNeill had visited the village Cottas, which had a completely different war story. This community is located in the upper reaches of Aliakmon River, about fifteen miles away from the border triangle between Greece, Albania and Macedonia. Under Turkish rule, the guerilla leader Cottas was born in that village, known then as Roulia. That irredentist rebel was hanged by the Turks; in 1912 the village was renamed Cottas, by the authorities.

In the early 20th century many migrants from the village moved to Toronto and Sydney, and began to call their relatives in their new residence. After a few decades, in 1947, over 2,000 Macedonians who descended from Cottas were living in Australia and Canada. Those immigrants were considered as members of the village community, because they continued to strengthen their families through remittances.

Domestic resources were sufficient for only four months a year. Apart from remittances, the local economy was supported by the work of the residents in constructions. In the late 1930s they had helped in the large drainage in Strymon river valley, next to Serres. During wartime the immigrant remittances had been adjourned.

McNeill supposes that during the Bulgarian occupation of Thrace some villagers were working in constructions made by the Bulgarian army, in order to relocate Bulgarian population in the occupied territories.

Once the German occupation ended, money orders started coming in again, and were completed in 1946 by food transitions organized by the UNRRA. But these aids were discontinued in November 1946, since Cottas, very close to the Yugoslavian and Albanian border was one of the first parts of Greece which passed under the prolonged control of the new guerrilla army. The land is barren in Cottas, and the village experienced famine, according to McNeill's testimony. Some kids had swollen bellies; all of them were emaciated. It was obvious that the physical survival of all residents of the village was very uncertain.

A few weeks after McNeill's visit in Cottas, the communist authorities, trying to resolve food shortages, moved to the north all the children of the village who were aged between two and fourteen years. The children were taken in Eastern Europe, from Warsaw to Tashkent. The village's population declined by 50%.

In 1956 the author visited again Cottas and found 188 inhabitants, a third of their population in 1947. In the period from 1947 to 1950 disease and hunger, along with armed violence, had sharply reduced the population of the village. However, there was a relative improvement. The same year, 1956, McNeill visited also Kardamili and Lofiskos for the first time.

Without prior personal contacts or recommendations, the internal relations that existed in these two villages were hidden. The visits were repeated in 1966 and 1976, in all those six villages. Within twenty or thirty years, accordingly, from the first to the last visit, the changes in the lives of villages were fundamental.

The local isolation had been broken and the old fashioned patterns of peasant behavior were amended, in response to local, national and international influences. It seems that this process was irreversible, since the communities created friendlier relations with the wider world, and embraced ideas and aspirations propagated by the media. The shift to autonomy and localism is no longer easy, and the older ways of peasant life have disintegrated.

To formulate an image of the villages supplying with labor Ancient Corinth, the author traveled to the opposite corner of the Peloponnese, visiting a community called Kardamili. The study of this village was continued later in the early 1960s, by the anthropologist Fred Gearing, who spent his summer vacation there. McNeill enriched his knowledge of the village, from Gearing's manuscripts, bearing the title: *Kardamili: Work and Honour in a Greek Village*.

To the Era of Public Utilities

In 1933, aside from the electricity generating companies in cities and towns, the Greek countryside remained isolated mainly due to the mountainous terrain and to the cost per unit for road construction. After World War II, the young scientists were seeking reconstruction, industrialization and social reform,[140] in the midst of a civil war.

In 1947, the country received physical and economic aid under the Truman Doctrine and the Marshall Plan. In 1950, the Public Power Corporation (PPC) established and started operating throughout the national network. Next year, PPC had compiled a preliminary list of towns and villages being included in the national electricity grid.

In 1954, the Steam Electrical Utility of Aliveri and the Hydro Electrical Utility of Louros started; in addition, the transmission-line Aliveri-Athens and the Hydro Electrical Utility of Agra were constructed. In 1955, the Hydro Electrical Utility of Ladonas followed, and until August 1956, the PPC had electrified provincial centres with a population of approximately 800,000, supplying the Electrical Enterprises of Athens-Piraeus, Patras, Ioannina, Arta, Edessa, Aigion, Preveza, Thessaloniki and many others.

By 1968 the PPC had bought off a total of 415 local electric companies, and since 1956 had introduced cheap domestic prices which permitted the use of the cooker, while the tariffs of local

[140] Mpatsis D. *The heavy industry in Greece*. Athens: Kedros, 1977; Raftopoulos, T.I. *The National Electric Network of Greece.* Athens: Papazisis, 1946; Pezopoulos, G.N. *The Development of Electric Energy in Continental Greece.* Athens: Ministry of Coordination – Coordination Agency, 1949.

companies being very expensive. The electrification was the main topic of trade fairs such as the International Fair of Thessaloniki, and the second electrification program began in 1955 with the opening of the Hydro Electrical Utility of Megdovas or Tavropos.

The illumination of the provincial roads and houses of the villages, the cars, the cinema and the radio, the household appliances, the kitchen, the electric iron, the neon lights and the phone gave to the country a chance to regain its children, whereas amplified the division of labour and the internal market. At the same time, agriculture made the leap from extensive to intensive cultivation, but with several class differentiations.

In rural houses, the electric lights and the radio were introduced firstly, followed by the electric refrigerator, the kitchen and later the laundry. The radio was the most widely used device, while the PPC was organizing across Greece demonstrations of electric stove, reaching up to rural centres and promoting electrical appliances.

Even in 1958, around 5,200 towns and villages lacked electricity. Industrial development in the countryside was facilitated by the presence of PPC, as happened mainly in Ptolemais and Kozani, with the addition of chemical industry etc. However, the main obstacle to development was the lack of adequate infrastructure in the field of mechanical engineering. Thus, supplied with technological equipment from abroad, the electrification projects overcame physical barriers in all regions of the country, with soaring consumption while maintaining the gap between the country and Athens.

The energy balance consisted mainly in the consumption in transport, industry and domestic sector. While consumption in agriculture and country lagged significantly. At the same time, breakthrough innovations such as informatics were necessary for the rational development of the national grid.

1. *Technology and Rural Urbanization*

The electric lighting was taming, civilizing, driving fear away and emphasizing the formulation of national roads and the unity of space:

> *The entire wonderful coastal road from Pyrgos to Patras and from Patras to Aigio and Corinth passes through villages and cities, which not only enjoy the light themselves, but also provide richly its joy and benefits for the nocturnal travellers*.[141]

The tall lampposts, the use of radio for entertainment at home, the trucks parked in the village, the electric pump, the ample light for reading, the little cars, the chauffeur, the cinema in Xylokastro, had boosted commercial traffic. Domestic work was not exhausting anymore.

> *There is no longer need for any villager bringing news from a musty newspaper. There is no Greek village, even the poorer one, who does not have its*

[141] Tarsouli G. "Civilization in the Greek village. Light in Tsoukaleika. Electrification and countryside". *Industrial Review,* 277, 1957, pp. 45.

own radio, and the Tsoukaleika listen to the latest news when Athens listens to them. Nevertheless, in entertainment too, the radio replaced the old phonograph funnel. The greatest help however is the electric light. The light that opens our eyes to progress and civilization. The light, which made the night day, that gave another sight to the house, that offered more hours of freedom to the housewife, of tireless study to the student, of relaxation and leisure to the father.[142]

Automobiles consumption boosted mainly in the 1960s, with the construction of the highway Athens-Thessaloniki. The establishment of cooperative buses called Common Funds for the Exploitation of Buses (ΚΤΕΛ), the encouraging of professional and rural vehicles, the presence of auto motion industries like VIAMAX, the proliferation of tricycles, trucks, taxis, helped increase productivity. Furthermore, tractors and harvesting machines disseminated in the countryside.

In the late 20th century, journalists started discussing the fury of the Greeks for the car. Even in rural and semi urban areas, the automobile was the specific difference in the consumption of higher income groups. Expenditure on cars constituted, in 1974, a very important component of the budget of households with average monthly purchases over 20,000 drachmas. On the contrary, no household with total monthly purchases less than 10,000 drachmas was spending money to buy a car. Hence, in 1974, there was a very

[142] Tarsouli G. "Civilization in the Greek village. Light in Tsoukaleika. Electrification and countryside". Ibid. pp. 47-48.

small percentage (2.6%) of rural households owning a car. The contribution of the telephone to the urbanization of the country was equally important.

Actually, the telecommunications had been introduced very soon, as early as the 19th century. Nevertheless, after 1950, the Organization of Telecommunications of Greece (OTE) was created, installing automatic call centres in all cities,[143] while in the countryside, community manual call centres were operating, which, with the expansion of intercity networks, would gradually be converted to automatic.

Primary historical sources on the composition of private consumption, altogether with the rate of diffusion of new technology and the phenomenon of urbanization are the Family Budgets.[144] For instance, between 1957 and 1958, electricity consumption in Athens was significantly higher compared to Thessaloniki and other cities, in proportion to the increased general expenses of the Athenian households. Similar differences were found in spending on cars and telecommunications.

Moreover, in small towns with a population of 10-30 thousand inhabitants, as Komotini, Corfu, Lesvos, Katerini, Chios, Trikala, Agrinio, Karditsa, Corinth, Yannitsa, Edessa etc., almost the fifth of the residents answered that they were farmers, ranchers, fishermen, etc.

---

[143] Telecommunications Organization SA. *Exposition of the Balance Sheet and Annual year 1962. Eleventh Economic Use.* Athens, 1963.

[144] National Statistical Service of Greece. *Household Budget Survey, conducted in urban areas of Greece during 1957-1958.* Athens, 1961; National Statistical Service of Greece. *Household Budget Survey, conducted in suburban and rural areas of Greece during 1963-1964.* Athens, 1969.

In 1963-64, the Family Budgets survey was conducted in semi-urban and rural centres; it was found that the vast majority of the households were using firewood in the kitchen, or oil, gas etc. In contrast, a few households had electricity and cooker. Almost everyone having electricity was using it exclusively for lighting.

Anyway, less than 1/3 of the sample had electricity for lighting. The vast majority, more than two thirds of the sample, was lit with oil. The villagers preferred oil from the extravagant electric light, because they were accustomed to procure oil in the neighbourhood grocery store exchanging it with olive oil.

During the period 1964-1974 there was a significant rise in the percentage of households using electricity for cooking in urban (54.1%) and semi-urban areas (20%), but the electrical progress was much slower in rural kitchens (from 0,4% to 3.7%). In the same period, the most striking transition in rural areas was from firewood to gas, as the proportion using firewood decreased drastically to 8.5%, while the percentage using gas hoisted vertically to 86.4%.[145]

Furthermore, even in 1961, in some areas of the country “there are groups of nomadic pastoralists, who, not having usually a permanent establishment, move from plains to mountainous areas and vice versa, depending on the time of year”.[146]

[145] National Statistical Service of Greece. *1974. Standards of living - private income and expenses.* Athens, 1977.
[146] National Statistical Service of Greece. *Results of the Agricultural-Livestock Census on 19th March 1961*, Vol. I. Athens, 1966.

The resistance was thus more robust among nomads, e.g. the Koutsovlachi and Koupatsaraioi nomadic shepherds acquired agricultural cars, paved roads, transport platforms, too late, after 1980.[147]

Evidently, since 1950, there was a rapid increase in the use of tractors, in the introduction of hatchers, gasoline, diesel and electric pumps, etc., especially in the lowlands. But the fact remains that a number of regions lacked basic infrastructure and they were characterized as “problematic” by the governments, i.e. the prefecture of Cyclades (except from Mykonos, Syros, Paros), the provinces Gytheio, Oitylos and Epidaurus Limira of Laconia, the "fire-stricken communities" of Helia, the province of Elassona in the prefecture of Larissa, the Laka in Souli, the province Voio in Kozani, the province Oropedio in Lassithi, the province of Sfakia and Selino, etc.[148]

It is no coincidence the rural depopulation (from 47% in 1951 to 30% in 1981) and the corresponding increase in the urban population from 38% to 58% over the same period.

Even in 1974, the average monthly expenditure was lower by 30% in rural areas than urban, while consumption in the villages consisted mainly in foodstuff (41.5%) and fell short in other goods, such as housing, water, fuel and lighting (16.0%), or durable household goods (7.2%), transport and communications (6.0%). At the same time, the rural households just started to acquire electric

[147] Chang Claudia. “Pastoral Transhumance in the Southern Balkans as a Social Ideology: Ethnoarcheological Research in Northern Greece”. *American Anthropologist,* 95 (3), 1993, pp. 687-703.
[148] Patellis G. “Elements of the Greek countryside”. *Technical Chronicles,* August 1978, year 47.

appliances, especially electric refrigerators and TV. In 1974, a 90.2% of urban households of the sample owned electric refrigerator, while a half of the rural households had not yet acquired. There were also a 40.2% of the farmers of the sample, which had neither telephone nor electric refrigerator or washing machine, or a television or car.

In a research conducted by EKKE in the late 1970s,[149] a noticeable difference was observed between the samples, concerning the possession of central heating (1.5% of rural, 8.5% of semi-urban, but 65% of the urban sample). The diffusion of television in the Greek houses was not yet completed in 1980, while in the countryside the number of rural households owning television barely exceeded 4/5 of the total.

Therefore, the urbanization of the countryside was promoted, particularly since 1950, along with the introduction of urban planning, electricity, telephone, radio and car in the mainland of Greece. From the house to the field, the technological modernization contributed to the degradation of the sociological type of the peasant and to the emergence of the new identity of the farmer, thanks to the new division of labour.

However - despite the emergence of innovative industries, such as rural electrification in cow houses, the pigsties, aviaries, etc., and the diffusion of television, transistors, radio transmitters, solar panels etc. - the process of the industrialization was hampered by the delay of infrastructure in mechanical engineering, i.e. the lack of

[149] Gizelis G., Myrizakis I., Passa-Gardiki O. and Teperoglou A. "Cultural activities within the family. First results of an investigation". *Review of Social Research*, b and c quarter 1980.

productive units of machinery, e.g. machine manufacture. The direct result of such a non-self-sufficient technological development appears more clearly in the reduced efficiency of the livestock industry, in the reduced meat production,[150] and in the subsequent slowdown of national income and progress in the agricultural sector.

2. *Audit Trail*

The concept of network, considered in terms of fast-moving and transporting loads from one subsystem to another, reveals at once the increasing importance gained by the combination of technologies in modern times. Technological subsystems, however, are useful and practical only if they are combinable between each other, but also with the human and natural environment.

An argument against technological determinism and historicism is derived from the environmental philosophy, which was created in the 1970's, with the environmental movement and the "counterculture".[151] From this perspective, development and growth should not be taken as sufficient goals, when ecology matters. Thus, the combined beneficial use of technological systems should have been a critical factor for the planning of spreading networks in the Greek countryside. An appropriate example of rapid engagement and combinatorial construction of technological subsystems is the transportation network, where the automobile and railway

[150] Babanasis S. and Soulas C. *The Greece in the periphery of the developed countries.* Athens: Themelio, 1976.
[151] Hay, P. (2004). "Environmental Philosophy". In: Krech S. III et al. (Eds.). *The Encyclopedia of the World Environmental History*. London: Rutledge.

technologies combine with the science of road construction, and with the technologies of government, telecommunications and construction of lights.

On the other hand, outdated and uncomfortable “technologies”, which are not ecologically necessary, may become a hindrance to the combination of production practices. Such an obstacle, for instance, was the ‘involvement’ of the manual rural telephones in the great boom of consumption that occurred in the 1960’s. At the end of the preceding decade, some pressure had been observed on the limited network capacity (34,130 in 1959) of automatic telephone exchanges in the country, but due to a small size of subscriptions (33,324 in 1959).

At national level, the total installed telecommunications capacity was growing at rates of 40,000 new telephone connections per year, from 1959 to 1962, reaching the 60-90.000 per year from 1963 to 1967. Furthermore, the number of active subscribers had risen to 547,568 in 1967, of which e.g. 108,622 were subscribed in 1956.

In 1974, the telephone density in Greece was 17%, but the telephone services were fully automatic to 98.6% of the local and 96% of the central network. Some remote mountain communities were still undeveloped, while in most islands a dense network of short wave connections had been extended, operating at frequencies of 2, 4, 6, 6.5 and 7.5 GHz.[152]

[152] Fikioris J. “Telecommunications in Greece - Present and Future”. *Communications*, *IEEE Transactions on Communications,* 22 (9): 1467 - 1469.

In the countryside itself, however, the manual telephone centers occupied a very small portion of the growing phone market. The subscribers of manual centers in 1967 amounted at 14,907, representing only a 2.72% of the total connections in the country. In the same category also appeared a lower demand, since e.g. in 1967, the active subscriptions of manual phones covered only 46.35% of the total installed capacity.[153]

Another example is the obsolete use of gas, firewood, etc. instead of electricity. In the table below, we see the average monthly purchases of electricity, fuel, etc. in 1957/58, as stated by the Statistical Service:

Average weekly purchases (in drachmas)	**Athens District**	**Thessaloniki**	**Cities with 30-80 inh.**	**Towns with 10-30.000 inh.**
Total	**1.053,5**	**762,7**	**745,8**	**623,8**
Electricity	**19,4**	**6,6**	**7,1**	**5,6**
Fuel in general	**19,0**	**28,5**	**21,8**	**23,3**
Carbon, lignite, etc.	2,7	3,2	2,3	3,1
Firewood	0,6	14,9	7,5	9,9
Oil etc.	2,6	1,1	3,8	1,2
Gas	1,5	0,4	1,1	0,8
Radios, musical instruments, etc.	**4,0**	**3,3**	**3,2**	**2,7**
Home electrical devices etc.	**6,3**	**3,1**	**1,6**	**0,6**

Household Budget Survey, conducted in urban areas of Greece during 1957/58

The increase in electricity consumption was, in general, high: In 1940, 28% of the population had access to the electricity, while in 1950 32%, in 1955 59.1%, in 1968 89.4%. However, despite the

[153] National Statistical Service of Greece. *1974. Standards of living - private income and expenses.* Athens, 1977.

sharp growth in demand that occurred from 1950 to 1970, the “per capita” consumption of electricity in the rest of Greece, except from Athens and Piraeus, remained much lower than in Athens.

Similar progress had been achieved in the mechanization of production. In 1952, the number of tractors in rural Greece was 5,000. The increase at 221,919 in 1980, and the increased use of fertilizers, made Moissidis[154] to observe a real rise or “mechanical superiority of Greek agriculture”. Machinery, fertilizers, modernization were increasing the production by an annual average of 4.8% from 1961 to 1974.

Moreover, the dependence of the farmer on the capitalist market was reinforced by the “non-agricultural inputs” of machinery and fertilizers. The farmers were realizing the enormous potentials of the industrial age, e.g. through unprecedented images, such as in freight traffic:

> *The view of refrigerators in Naoussa, that shortly after they emptied of thousands of tons of peaches, they were quickly filled up again with fresh...*[155]

The study of Moissidis[156] proved yet that the concentration of land in agriculture, although being continued with no interruption in rural Greece, presents varied results due to intensification, specialization and industrialization of production.

---

[154] Moissidis Antonis, *The rural economy in modern Greece. Production and Social Structure (1950-80).* Athens: Foundation of Mediterranean Researches, 1986, p. 58.
[155] Papathanassiou et. al. *The system of trading and transporting fruits and vegetables in Greece.* Athens: KEPE, 1978, p. IX.
[156] Moissidis Antonis, *The rural economy in modern Greece.* Ibid.

The concentration is also delayed by the big-farmers' need to have available labour-force among the small farmers, but also by the difficulties to match the consensus and the desire of many owners to give up with their limited acreage. Furthermore, as large farms avoid the labour-intensive crops, and as they are highly mechanized, the concentration of land favoured the seasonal, rather than permanent employment.

The modernization also had other inevitable results. Before the introduction of mass imported labour from abroad, wage labor, was apparently falling from 7.2 workers employed per employer in 1950, to 3.3 workers employed in 1971. However, the wageworkers were producing multiple surplus values, because the technical equipments were multiply increased and, consequently, the productivity of labor multiplied.

The use of machines allowed temporarily to reduce wage labor, but also changed the boundaries that divided the small, medium and large production. Thus, a "farmer who was considered as small with 2-5 hectares, today must have 5-7 hectares. The middle farmer 7-10-15".[157]

At the same period, the technological modernization (with modern equipment, facilities, trucks, tractors, platforms, harvesters, etc.) caused appreciable changes in the differential rent, whether from the reduction of all kinds of distances between farms and markets, or from differences in capital invested.

[157] Panitsidis, G. *Marxism and the Agrarian Question in Greece.* Athens: Modern Age, 1984, p. 45.

For this reason, the creation of agro-industrial complexes with factories of poultry, milk, pork, etc., had weakened not only the small farmers but also the big ones.

Thus, at the end of the 1950-80 period, the technological modernization of the rural economy was gaining huge importance for the goals of the monopolistic capital, as shown for example from the subsidies given from 1980 to 1983 to ship-owners and supermarkets, for the construction of 900 hectares of greenhouses, packing facilities with refrigerators, fringe-transports, setting up companies, etc. This is the process of submission of rural economy and of the market of agricultural machinery, pesticides, hybrid, etc., to the multinationals, banks and monopolies.

Technology and Division of Labour

A specific range of factors, circumstances and objectives, modern and traditional, determined the pervasiveness of technology in the Greek countryside, in the period after 1950. Reformist politicians,[158] public works constructors, manufacturers, engineers, technicians, producers of electrical equipment, educational institutions, associations and communities, were the protagonists of the transformation of Greece, with electrification, communications, transportation, monetarization, elevation of the quality of life. A revolution, "the most peaceful and the most groundbreaking",[159] had apparently begun.

At a time when the country was coming out ravaged of a fifty-year period of warfare or social turbulence, the economic and technical role of the modernizers[160] who were promoting the optimistic 'technoscience'[161] was strengthened. The "super-maximum edifice of electrification" acquired for the technocrats a single purpose:

> *To bring civilization, the modern technical civilization throughout the whole of Greece, and mainly to the neglected countryside. In most parts of the country, which until today, 130 years now, from the time our Greece became independent, not only*

[158] Hatzivassiliou, E. "Greek Reformism and its Models: The Impact of the Truman Doctrine and the Marshall Plan". *Journal of Modern Greek Studies*, 28 (1), 2010, pp. 1-25.
[159] Konstantinidis F. "The electrification of the whole of Greece, as displayed at the booth of PPC in the Exposition of Thessaloniki". *Industrial Review,* 24, 1957, p. 641.
[160] Botsiou K.E. "New Policies, Old Politics: American Concepts of Reform in Marshall Plan Greece", *Journal of Modern Greek Studies,* 27 (2), 2009, pp. 209-240.
[161] Kakridis, A. "Deus ex machina? Truman/Marshall Aid, Engineers, and Greece's Post-war Development Discourse". *Journal of Modern Greek Studies,* 27 (2), 2009, pp. 241-274.

lacked the experience of the slightest progress, but ignores, almost completely, even the more basic and elementary techniques and discoveries of the century passed and of the one we are experiencing today.[162]

However, many inconsistencies, omissions, setbacks interfered with the modernization process, since the political oppression was postponing the development envisioned by the young scientists.[163] The technocrats among them were claiming, with some exaggeration, that "very soon the Greek provinces will have more and cheaper electricity than the capital".[164] Nevertheless, after the war, many villages were remaining destroyed or deserted by the displacements, and the whole countryside was poor and without infrastructure.

1. *Technology and capitalism in rural Greece*

During the 20th century, the penetration of technology networks branched out in the Greek mainland and capitalism strengthened. At the same time the transition from a subsistence economy – i.e. from a closed or semi-closed economy, dominated by self-sufficiency and personal consumption – to the commercialization and the shaping of an internal market intensified; particularly through the expansion of the division of labour (e.g. home economics) and the relatively

[162] Konstantinidis F. "The electrification...", Ibid, p. 641.
[163] Mpatsis D. *The heavy industry in Greece.* Athens: Kedros, 1977; Raftopoulos, T.I. *The National Electric Network of Greece.* Athens: Papazisis, 1946; Pezopoulos, G.N. *The Development of Electric Energy in Continental Greece.* Athens: Ministry of Coordination – Coordination Agency, 1949.
[164] Konstantinidis F. "The electrification of the whole of Greece, as displayed at the booth of PPC in the Exposition of Thessaloniki". *Industrial Review,* 24, 1957, p. 641.

diminished multi-employment. However, as shown in empirical studies,[165] the allotment of a part of the production to self-consumption has never ceased to be a permanent feature of the rural household.

Generally, and almost until the Balkan wars, in Greek agriculture prevailed 'the spirit of the closed economy', as Evelpidis wrote in 1944. Farmers and peasants were producing the necessary for the maintenance of their families and they were either self-sufficient or exchanging some products between the plains and the mountain pastures, thus self-implementing their needs. Exceptions were some farmers, particularly in North and West Peloponnese, which produced for the market (raisins), and some large landowners in Thessaly and Macedonia.

Since the end of the war in Asia Minor, the character of the rural economy began to change, by the prevailing type of the semi-closed economy. 'Islets' of closed economy were still surviving in some mountainous regions of the country lacking transportation, such as Tzumerka and Agrafa. Apart from the former, other farmers were the majority and produced mainly for themselves, combining farming, forestry etc.

However, in the early 20th century, the Greek agriculture remained the most backward in Europe, mainly due to the structure of the segmented landowning, which excluded modernization, but also because of the reluctance of property owners to introduce technology and a variety of crops.

[165] Damianakos, S. *From the Peasant to the Farmer. The Greek Rural Society toward Globalization.* Athens: Exantas / EKKE, 2002.

The prices of wheat and bread were rising rapidly, because of the tariff protectionism, introduced by Trikoupis; the prices of land were also rising. Thus, the movement for the expropriation and redistribution of manor-land found broad popular appeal, led to agrarian reform and strengthened the cooperative movement.[166] The redistribution of the large properties was also seen as a direct result of population shifts caused by annexing new territories and population exchange. However, behind the land reforms was hidden the fear of revolution.

The monetarization of the agricultural production evaluated the output, contributed to the intensity of the production, and to the shift to more profitable crops. But the dependence on the international market was decisive: the Greek agricultural production was hit by the international crisis in the early 20th century, after the general agricultural crisis of 1921-23, and finally met the hard impact of the global crisis in 1929-32.

A turning point was the abandonment of the gold standard by England and the forced circulation of sterling imposed on 20th September 1931, which led a series of countries that were allied with the English trade to abandon the gold basis. But as Vergopoulos[167] explains, the crisis of 1929 had an effect comparable to Keynes's 'Great Depression' in the last quarter of the 19th century, when state intervention was favoured in dependent countries:

[166] Leontaritis G. "Economy and Society from 1914 to 1918". In: *History of the Greek Nation,* Volume 15 (2nd Edition). Athens: Athens Publishing, 2008; Giannoulopoulos I. "The economy from 1919 to 1923". In *History of the Greek Nation,* Volume 15 (2nd Edition). Athens: Athens Publishing, 2008.
[167] Vergopoulos, K. "The Greek economy from 1926 to 1935". In: *History of the Greek Nation,* Volume 15 (2nd Edition). Athens: Athens Publishing, 2008.

> *Indeed, although around 1880 there was a "first phase of industrialization of agricultural countries", during the decade 1930-1940 occurred a "second phase", which intensified and deepened the processes that had begun with the first*.[168]

The debilitating effects of war on the international transport and trade, the blockade of the Greek ports by the Entente in 1916, but also the big business with the troops of the Entente in Macedonia, the profits of war and the influx of refugees had fostered the move of a portion of the domestic capital to the industry.

However, despite the significant increase in production and in the number of factories, the industry was unable to pass the manufacturing stage: in 1920, 70% of small and large industrial enterprises were food factories, flour mills, oil presses, wineries, pasta industries, bakeries and raisins processing facilities.

A commonplace of historiography is that the evolution from the cottage industry to manufacturing in Greece, especially the emergence of the revolutionary potential of the industry, was hindered or undermined by the commercial bourgeoisie. According to this perspective, the reseller's, broker's character of the Greek Capital, concentrated in services, banking and shipping, is responsible for the slow industrialization and the prevalence of light industry. The theoretical error here lies in the emphasis on the broker's character in order to 'establish' the dependence of the domestic capital on imperialism, ignoring and underestimating the

[168] Vergopoulos, K. Ibid. p. 327.

expansionist tendencies of the Greek capitalism.[169] Nevertheless, some modern historians,[170] although they disagree with the interpretation that insists on the huckster character of the Greek economy, believe that the shift to services has been a conscious decision, which premised the ousting of industrialization, because the shipping and the industry are in competition with each other.

But a justifiable objection to the correctness of this economic strategy is the following: As long as the services sector is dominant, the internal market in Greece is impossible to overcome the simple commodity production (Commodity-Money-Commodity), and to reach the stage of the expanded commodity production (Money-Commodity-Money). Further, the rejection of the industrialization reveals the indifference of the Greek high bourgeoisie for the development of the Constant Capital (C) with investments in transportation, consumption, production in urban or semi-urban centers. In other words, in Greece, there is a lack of interest in improving the organic composition of capital, equal to the ratio C/V (of Constant to Variable Capital).

In rural areas and in agricultural production the Constant Capital gets under Sakantanis'[171] analysis, the following forms: Land Capital - Building Capital – Livestock Capital - Machines and Tools Capital (Substantial Capital) – Circulating Capital – Savings Capital. Regarding the extent that these funds remain unutilized, e.g. pastures, they can generate only absolute rents. But when they are put in productive investments, capital can produce differential

[169] Milios, J. "Is the "anti-imperialism" a left-wing ideology and politics?" *Theseis*, 88, 2004.
[170] Dertilis G.V. *History of the Greek State, 1830-1920* (4th Edition). Athens: Estia, 2006.
[171] "The problem of agricultural funds in Greece". *Antaeus,* 2nd Year, 1945.

rents. Indeed, we define the capitalists by their characteristic *orientation* towards acquiring more and more means of production; the Capital is allotted to productive consumption, as opposed to the individual consumption by individual consumers.

On the other hand, as explained by Marx, in the pre-industrial societies: Beside the autonomous producers, craftsmen or peasants with their ancient, traditional mode of production, the moneylender or trader appears, the usurious capital or business capital, which squeezes them parasitically.[172] Regarding surplus value, in the pre-industrial phases, we distinguish between: a) Extracting overtime labour by direct coercion, and b) The formal subordination of labor under capital, in which absolute surplus value is extracted by the particular form of overtime labor.

By contrast, c) in the specifically capitalist mode of production, in the place of the formal comes the real subordination of labor under capital. In this case, either the working day remains constant, but the intensity of labor increases, or the productive power of labor rises, or the number of workers and the mass of the Constant Capital increase, e.g. buildings, machinery, etc., to allow thus the exploitation of a greater mass of labor (here we overlook the cuts of the salary or the wage compression below the normal height).[173]

[172] Marx K. *The Capital*, I. Athens: Modern Era, 1978.
[173] Marx K. *The Capital*. III.

2. *From fairs and crafts to the industrial and commercial centers*

Examining the strategic economic choices of the Greek bourgeoisie in this period, we can conclude that a visible target of the modernizers was the catalysis of the subsistence or self-sufficiency economy, and the broad monetarization of economic life across the country. The Greek economy was traditionally based on the age-old bases of shipping, trade, shipbuilding and agriculture. State ownership of land was enhanced, but the production was always small. In the countryside, during the 19th century, the peasants paid all taxes in kind, because they had not introduced financial exchanges. This fact reveals an important feature of the Greek economy, which seemed to be perpetuated: the separation in subsistence-sector and market-sector.

> *The subsistence economy implies a relative economic self-sufficiency and personal vocation with a variety of productive actions, to ensure self-sufficiency. A market economy, in contrast, requires division of labor, specialization, and exchange of goods and services with money and with the mechanism of supply and demand*.[174]

The subsistence economy was prevailing in the hinterland of mainland Greece, while the most advanced market economy was operating on the coast and islands, where the ease of communication (as opposed to the isolated provinces), facilitates market function and development of merchant shipping. Many

[174] Petropoulos J. and Koumarianou A. "Otto's reign: 1833-1862". In: *History of the Greek Nation,* Volume 13 (2nd Edition). Athens: Athens Publishing, 2000, p. 94.

farmers were producing mainly for the market, such as the raisins producers in Peloponnese and Crete, the fruit and vegetable producers in Attica, Argolis, Crete and Pelion, the cotton producers in Levadia and Laconia, the wine producers in Lefkas and Samos.

Traditionally, the farmers sold their surplus crop, usually every week in the bazaar of the most central town of their region, where the routes met and villagers of the mountain populations could descend for trading. Since old times, annual fairs with a wider radius were also established, such as in the markets of Serres, Larissa and Lamia. Gradually also, urban centers developed, which became permanent agricultural markets, either for local use or for exportation. The latter kind of trade was mainly based on the coastal cities, e.g. Piraeus, Patras, Volos, Thessaloniki, Kavala , Kalamata, etc.

Year by year, itinerant merchants or commercial agents were coming to the village and buying the main items for sale. This had indeed become the rule for those products, most of which were brought to trade by certain organizations or industries, especially tobacco. The farming industry was vital to this transformation. By 1940, 160 cooperative mills, 100 wineries, distilleries, canneries, raisins factories, figs-sterilizing companies, fruits-drying, dairies etc. In Greece there were also several water-drawn saws processing each year 130,000 cubic meters of timber. The ginning industry included 104 factories and the textile 350-400.000 handlooms.

3. *The electric industry*

In the interwar period, small and tiny companies with petty capital and limited production capacity were supplying all the Greek cities of over 5,000 inhabitants. In 1933, there were a total of 383 electric companies, of which 338 were located in towns and villages.

The provincial units were certainly much smaller than the electric companies of major cities, but "the power of innovation ... was not confined to large urban centers. On the opposite, it was being diffused in the geographic space increasingly".[175]

The Electric Company of Athens and Piraeus was supplying 50 suburbs and villages. The Electric Company in Patras 16 villages, the company in Mytilene 7 villages, in Nafplio - Argos 15, etc. Moreover, the factory in Assos – Vrahati served 7 villages and the complex in Vellos - Kiato 7 villages. A total of 450 villages had electricity.[176]

In Limni Evia, in Molaoi Laconia, in Papados Mytilene, mills and oil-presses were operating with electricity taken from the same engine supplying the surrounding villages at night. The same can be mentioned according to the electricity supply for refrigerators in Agria, in Oropos, in Neapolis Lassithi, in Kiparissia. While in Athens, Argolis, in the area of Patras, Chania, Kalamata and Thebes the electricity was used for irrigation.

[175] Vaxevanoglou A. *The social reception of innovation. The example of electrification in the interwar Greece*. Athens: Centre for Neohellenic Research of the National Hellenic Research Foundation, 1996, p. 24.
[176] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943.

The facilities were operating mostly with coal or oil, except from Patras, Chania, Agia, Veria, Naoussa, and some other minor hydrodynamic units, which often had supplementary thermal units. On regard of the efficiency of the utilities, Evelpidis proposed the elimination of the wasteful little factories and the establishment of large hydropower plants and auxiliary steam. For islands, he insisted on wind power, which had already prototype standards in the windmills of Lassithi plateau, in Cyclades, etc., while modern wind appliances were developed by European companies, such as the *Wind Electro Dorf Hogel*, in Schleswig.

That period, 26.7% of the Greek population was consuming 82.6% of the generated electricity. In most cities, the consumption was much lower than the average. “Note, however, as an indication, that a consumption of 50 Kwh yearly per capita corresponds to the extremely economical use of the lamp of 50 watt, and that 80% of the largest Greek cities were below this level”.[177] Regarding savings in lighting, “just point out”, as Evelpidis writes,[178] “that 1 Kwh costing 8 drachmas saves three kilos of oil, costing exactly four times more (in Athens’ prices)”.

A study carried out in the region of Kilkis found that the average villager had to use an average of 15 wagons of firewood to meet all the needs for a year. Nevertheless, the peasant used only 6.5 wood wagons and the remaining was complemented with manure and straw. 40% of dung was being burned for cooking, washing, heating.

[177] Vaxevanoglou A. *The social reception of innovation. The example of electrification in the interwar Greece*. Athens: Centre for Neohellenic Research of the National Hellenic Research Foundation, 1996, p. 51.
[178] Evelpidis, C. *The electricity in the countryside.* Athens: Papazisis, 1943, p. 93.

Evelpidis, who became Minister of Agriculture and Finance, used the term "symmethexis" (communion, group participation and sharing) to describe the initiation of most of the inhabitants of Greece in the goods of civilization. The symmethexis with the electric facilities is possible through the introduction of the various applications of electric power and, mostly, of the electric pumps for irrigation.

4. *Rebuilding in the Countryside*

According to statistical data of the Agricultural Bank (1944), there were 115 completely destroyed villages (42% of the total number of the destroyed ones) with less than 500 inhabitants, 90 (33%) with 500-1000 inhabitants, 75 (21%) with 1000-2000 inhabitants and 8 (3%) with more than 2000 inhabitants. The consequences of the war had been tragic in villages such as Ano Kerasia. In 1943, the German army destroyed the village and after the war, the Greek government banned the reconstruction of Ano Kerasia, ordering that no one should be allowed to ascend the heights where the pastures and woodlands of the village were found.

In 1945, the Greek villages amounted at about 10,500, dispersed across 5,500 communities. Of these, 1/3 were mountainous (altitude over 500 m), 1/4 hilly (200-500 m) and 5/12 lowlands. Only 1/3 of the surface was flat (altitude below 200m.). In 1945, the 1/2 of the people was residing on altitudes above 200 meters. In addition, after the advent of the refugees from Asia Minor, the state built about 450 new villages.

Although Greece has 750 ports and harbours that can connect a significant part of the hinterland with the sea, however, the country needs a disproportionate length of roads in relation to its surface and its density, because the mountainous land increases the unit cost of road construction. “The ratio of 1 km road to the surface in square kilometres is 10 in Greece, 6 in Bulgaria, 1.6 in Romania and 0.8 in France”.[179]

Moreover, the corresponding relation of the transport infrastructure to the number of residential areas in 1945 was: a) In Greece, about 10,500 towns and villages, 15,000 km of roads, 2,650 km railway. b) In Bulgaria, 5,700 towns and villages, 16,500 km roads and 2,931 km rail network, and c) In France, 40,000 cities and villages, 632,000 km of roads and 43,457 km rail.

In Greece, the villages were not always correctly situated, especially concerning the primary criterion, which is production. Kydoniatis[180] observed that 76%, of the 270 Greek villages that were completely destroyed during war, had a population below the tolerable constitution of a village, with less than 1000 inhabitants.

In late 1945, D. Mpatsis, N. Kitsikis and their team in the journal *Antaeus* (Ανταίος) realized that the reconstruction had not even begun. The program of the *Antaeus Circle* was Education disseminated to the whole of the People, even for the last peasant-child, and popular democracy that would abolish poverty and backwardness, eliminate the primitive means of production, and stop the “relinquishment of our natural wealth for a minimal return”.

[179] Kydoniatis, S.P. “The position of the Greek village”, *Antaeus,* Year A, 3: 75-77, 90 & 4, 1945, p. 110.
[180] Kydoniatis, S.P. Ibid.

4.1. *Industrialization and electrification*

The reconstruction program should spur industrialization and reconstruction, and build a broad internal market.[181] Along with the journal *Antaeus*, the Society “Science – Rebuilding” was working. A committee of this society in early 1947, consisting of the Chairman Evelpidis and the members Kitsikis, Maximus and Angelopoulos, met with Porter, Truman's envoy, submitting a memorandum for the reconstruction of Greece. Shortly afterwards, at the end of the civil war, 700,000 villagers, one-tenth of the country's population, were living in refugee camps at the outskirts of cities.

Proposals to solve development problems had been already stated: In the preface of Mpatsis’s book *The heavy industry in Greece*, professor Kitsikis argued that

> *the heavy industry in Greece, namely the development and the metallurgical transubstantiation of the excellent, diverse and abundant mining wealth of the country, the machining of metal products, the construction of machinery and in general the building of means of production, the establishment of shipyards, the installation of electrochemical factories without preferential concessions to foreign capital, is the only way out of economic stagnation, the only way for stable progressive economic reform and recovery, the redemption of the Greek economy and national labor from the shackles of foreign capital,*

[181] Kitsikis, N. "Preface" in D. Mpatsis, *The heavy industry in Greece*. Athens: Kedros, 1977.

pursuing a policy really serving the interests of the people.[182]

The Deputy for Reconstruction Doxiadis was proposing investments in industry. On the contrary, Varvaresos, former Director of the Bank of Greece, considering the Greek parasitic bourgeoisie, proposed economic development based on: a) Increase in agricultural production. b) Small and competitive businesses, especially provincial, producing high consumption commodities. c) Increase in building activity.

Zolotas, however, the new Director of the Bank of Greece, rejected the views of Varvaresos, "describing growth as the optimum utilization of resources, which involved capital equipment and latest technological methods",[183] and referred to a report by the UN advocating industrialization as a key element of economic growth.

Next years, the achievement of the post-war goal of monetary equilibrium relied heavily on the spectacular development of the invisible receipts, emerging as the most dynamic element of the asset side of the balance sheets. The invisible receipts, since late 1950's, exceeded the revenues from the exports, and then grew at a faster rate, reaching in 1960 almost 150% of the value of exports, while in early 1970's the value of the invisible receipts was twice that of exports. Before the war, however, Alexandros Diomidis - who served as Minister of Finance and Director of the National Bank and the Bank of Greece - had indicated that Greece should not be based

[182] Kitsikis, N. "Preface" in D. Mpatsis, *The heavy industry in Greece*. Athens: Kedros, 1977, p. 17.
[183] Karagiannis S. and Nicholaou A. "Industrial Policy in the first post-war decades." In: *The Greek society during the first post-war period (1945-1967)*. Athens: Saki Karagiorga Foundation, 1993, p. 100.

on “invisible resources” from abroad, but should focus attention on “the exploitation of its own productive resources”.[184] Key elements of the modernization policy should be exactly the electrification and the industrialization.

In December 1946, the Prime Minister K. Tsaldaris visited the U.S. to seek support. Next January, the U.S. envoy Porter arrived in Greece. After making a thorough study, Porter proposed a plan to stabilize the Greek economy and solve the problem in currency exchanges by increasing the production and exports. He argued that a single help was not enough, promising systematic effort within a five-year program totalling 1,675 million dollars or 335 million on average per year (the amount is excessive in relation to the realized aid). He also expressed severe criticism on the 7 governments passed between liberation and March 1947. A direct consequence of the Porter Report was the Truman Doctrine and the Marshall Plan.

Additionally, in the mid 1950’s, the Greek government accepted French granted credits for the purchase of facilities and networks equipment, exclusively for the electrification of the provinces. Public Power Corporation had compiled lists of necessary materials, which were given to the ministers of Coordination, Industry and Economics. Moreover, based on the Greek-Italian Agreement on Economic Cooperation, 32.5 million dollars (654.23 million drachmas) were granted to the PPC, until June 30, 1954.

[184] Kazakos P. "The Greek Economy, 1949-1967: Reconstruction and Development". In *History of the Greek Nation,* Volume 16. Athens: Athens Publishing, 2000, p. 225.

5. *The national system for the production and transmission of electricity*

In August 1950, the Minister of Coordination Tsouderos, introducing the organization responsible for the execution and operation of energy projects, tabled the Act for the "establishment of the Public Power Corporation". Two months before that, the U.S. mission in Greece announced the finding of an ore of 100 million tonnes of lignite in Ptolemais, and the same day the Industrial Link of Greece informed about the rise in industrial production in April to 99% of that of 1939, with power generation increased by 202%.

In late May 1952, the transmission line Agra-Thessaloniki had been completed, while works were continuing for the transmission lines Aliveri-Roof, Roof-Patras, Corinth-Ladon, Megalopolis-Kalamata, Kavala-Thessaloniki and Schimatari-Lamia. That same year, construction works were progressing for the transformation substations of 150.000/15.000 volts, as well as works on the mine of Aliveri, which was feeding exclusively the Steam Plant of Aliveri.

Serving as Minister of Industry, Zigdis administered in 1952 an amount of 2,171,000 dollars, as U.S. assistance. Of this, amounts of $1,564,000 were planned to be released for the modernization of Athens Facilities, with the forthcoming delivery of power from Aliveri. An amount of $235,000 would be used for the modernization of private electric companies mainly "to businesses that operate in the islands".[185] The rest $320,000 would be given to the Municipal Gas Company of Athens for the purchase of two kilns burning coal.

[185] "The facilities of the Electric Company will be complemented". Newspaper *Eleftheria,* 30.05.1952, p. 4.

The Transmission Line Aliveri-Athens

In 1953, the PPC prepared a preliminary list of cities and villages "included in the first stage of the project for electricity distribution",[186] and from the first year supplied with electricity a number of electric companies, throughout Greece.

The implementation of the project included the integration of the first customers to the network, the construction of Steam stations, Hydroelectric stations and autonomous stations in the islands, and the basic plan of a national system for the transmission and distribution lines.

[186] Public Power Corporation. *Annual Report in the Fiscal Year 1953-1954.* Athens, 1954, p. 19.

By 1954, the thermoelectric plant and the mine in Aliveri began to operate, the hydroelectric plant in Louros, with transmission lines and substations. PPC was already supplying, wholly or partly, various cities (Ioannina, Arta, Patras, Athens). The first customer of the PPC was the Electric Company of Athens, followed by "Glaucus" in Patras, the Electric Companies in Edessa, Aigion, Preveza, etc. Initially, the focus was on clusters of cities and villages gathered closely around the substations, for economy reasons.

The hydroelectric in Ladon was the starting point for the advent of electric lighting, heating and electrification throughout the countryside, which at the 2/3 of the area and 4/5 of the population was living in the dark. On March 19, 1954, the hydroelectric of Louros was starting up, supplying with electricity Ioannina, Arta and intermediate communities from the primary distribution network (15,000 volts).

Once the PPC started supplying with electricity the Greek Electricity Company of Ioannina, the 15,000-volt lines and facilities of the Epirus region were leased to the aforementioned company "on a temporary monthly basis".[187] In May 1954, the Electric Company of Arta was also connected with the network. On 30.6.1955, the number of towns and villages connected directly or indirectly with the National Network of PPC was 180, "of whom 150 were seeing for the first time the electric light".[188]

[187] Public Power Corporation. *Annual Report in the Fiscal Year 1953-1954.* Ibid. p. 64.
[188] "The Report of the Board of the Public Power Corporation ...", 1956, p. 128.

The same year, the number of retail customers of PPC amounted at 9,326, including 1,712 customers served by the electric companies of Glaucus and Aigio.

Around 1956, there were still operating in Greece, apart from the PPC, 385 different Electric Companies. “The solution to the distribution of electricity was given in 1956”, as suggested by Vassilakopoulos,[189] “with the Law 3523, by which the State declared the termination of preferences and licenses for all Electrical Enterprises and respectively extended the preference of PPC for the distribution of electricity across the country, mandated for this purpose to activate the procedures for the acquisition of all electrical holdings”.

In 1956, the PPC was introducing a uniform price list for the promotion of home electrification, while the prices of the local companies were prohibitive for the use of cookers. Indeed, the expansion of the network in rural areas and islands, combined with the introduction of the cheap price list lifted off the PPC.

> *“The ‘one and ninety’ which I told you, it was one and ninety drachmas for the first kilowatts, the second was cheaper, the third cheaper. And it was one and ten. It was an advantage, in other words, to burn more, because the average price was going*

[189] Vassilakopoulos, S. *The Redemption of the Electric Companies in Greece.* In: Public Power Corporation, Education Division, *Scientific Bulletin,* 25, Year 7th. Athens, June 1980, p. 19.

down ... This ended in 1993, 1996, when they said 'economy with the electricity' ..."[190]

The main problem was that, after the price reduction, the consumption increased and the local networks faced voltage drops in the "cutting edge" evening hours, because they could not endure more load. The PPC was assuring the public that its own network was modern and 'capable to endure any load'.

As we read in the related statement: "the competent services of PPC are meanwhile dealing with the valuation of the 305 private and municipal power utilities, which will be redeemed by it".[191] Almost all private and municipal networks had to be dismantled because they were "obsolete, faulty and uneconomical".

In many cities, the supply of electricity was available only in the evening. The breakdowns were quite often. "Whole districts across the edges of the cities didn't have any electric service at all".[192] The elevated operating costs and low consumption led to high prices per kilowatt-hour, which further hindered consumption. "For example we mention that when in 1955 the price per kilowatt hour of electric lighting was 1.417 drachmas in Athens-Piraeus, in Pyrgos it was 5.33 drachmas, in Florina 4.99 drachmas, in Kimi 7.98 drachmas, in Andritsaina 11.30 drachmas, etc."[193]

[190] Interview with Isaac Levi, to Mary Mavroeidis. Historical Archive of the PPC, Athens: 2003, p. 34.
[191] Public Power Corporation. "Statement". Newspaper *Eleftheria,* Athens, 18.11.1956, p. 6.
[192] Vassilakopoulos, S. *The Redemption of the Electric Companies in Greece.* In: Public Power Corporation, Historical Monographs, Issue 1. Athens: 1979, p. 9.
[193] Ibid. p. 8.

6. *The second program of electrification*

The press was stating that the first program of electrification of the country had been "accomplished entirely with foreign designs, foreign brains, with foreign money - American aid and Italian reparations".[194] The only exception was the construction of the dam of Louros, which was assigned to the Greek ETER, in cooperation with the Omnium Lyonnais.

> *The second program is an entirely Hellenic Project, performed under the full responsibility of the Greek administration of PPC and with Greek resources. Foreign money is also used, but only credits given with bank criteria*.[195]

On December 18, 1955, took place in Thessaly near Vlasdo, Karditsa, the opening of the construction of the new hydroelectric project in Megdovas. This was the first project of the second program of electrification, while the first was financed with money from the Marshall Plan. With a total water capacity tenfold that of Lake Marathon, the "deer lake", the Nevropoli, on a plateau 792 meters above sea level, it would be feeding the hydroelectric plant Tavropos, which added 250 million Kwh per year to the national production system. Tavropos, with a total installed capacity of 200.000 KW, would maintain the first place until the construction of the large dams of Acheloos and the addition of the second unit in Ptolemais.

[194] "The electrification program is now entering a novel phase". Newspaper *Macedonia,* Thessaloniki, 15.08.57, p. 4.
[195] Ibid.

At the same time, subsidies, distributions and wages are offered to encourage the return to the destroyed villages. In parallel, the subsistence and self-sufficiency economy was limited, with the expansion of transport (roads, buses), communications (radio) and especially with the National Networks of PPC and Hellenic Organization of Telecommunications (OTE).

“Levers” for the monetarization of the Greek rural economy were also the implicit receipts (shipping remittances, migrant remittances, travel foreign exchange, insurances, etc.) and the proliferation of exports and imports. The newspaper *Kathimerini* (6 January 1957) stated that the “ongoing projects already cover an invested amount of millions of dollars. These projects include Megdovas, oil refineries, the Ptolemais lignite, shipyards, air transports, and the proclaimed nitrogen industry”.

At the same time, the electric lights, the refrigerators, the washing machines, the pumps led to a greater division of labor, thus, to the commercialization and the creation of an internal market. The fight against malaria, the public transports, the increasing arable land and production, the irrigation and the initiation to the cooperative production were now possible thanks to technological modernization. The investments in agriculture with low subsidized interest rates, the high wages to agronomists, the financing of reclamation projects in Axios and Aliakmon, the establishment of centers for cereal production for the developing of new varieties, and the establishment of the Farmers’ Insurance Organizations in 1958, were uplifting the living standards of agrarian life.

7. *From the EEC to the remote villages*

In 1955, Messina, in Sicily, was hosting the meeting of Western Europeans for the creation of new organizations, after the successful experiment of the supranational European Coal Steel Community (ECSC) in 1952. Controversies arose regarding the equal treatment of Greek products, the common agricultural policy on tobacco and raisins, unresolved issues of funding etc.

> *In the early 1961, the main points of disagreement were identified persistently to the guarantees for the equal treatment of Greek products, the possibility - after Italian demand – of suspension of the implementation of reduced-duty or duty free Greek exports of citrus and some fruits etc.*
>
> *Finally, in the financial field the difference of views focused on determining the amount of emergency aid, providing also the possibility of recourse to the European Investment Bank, after its exhaustion, and, as a return, the assumption, by the Greek side, of the obligation to regulate the external public debt*.[196]

On March 30, 1961, the customs union with the EEC was announced. Therefore, the process of socialization and internationalization of labor and produced goods was intensified. Consequently, the social division of labor was deepening. Commercial relations were branched out and developed. The lease, the purchase and sale of land increased, creating greater

[196] Svolopoulos, K. *The Greek foreign policy 1945-1981* (8th ed.), vol. II. Athens: Estia, 2008, p. 127.

socialization of production, development of large production. The increasing commercialization of land decomposed peasantry. Wealthy peasants acquired many more sophisticated technological tools than the middle peasantry, while the poor owned only a few modern tools.

Additionally, the more the size of the household increases and the crop quality improves the less production costs. Technical progress in agriculture is expressed differentially, depending on the system of economy and cultivation; e.g. while in the extensive cultivation of cereals the wage labor is reduced by mechanization, however, in livestock and in industrial plants, the mechanization marks the transition to intensive agriculture, where the need for waged labor increases.

The Electric Enterprise of Athens and Piraeus consumed in 1958 about 100,000 tons of lignite and about 150,000 tonnes in 1959. The Steam Factory of Aliveri consumed in 1958, 565,000 tons of lignite. However, 5,200 towns and villages were remaining without electricity. In 1958, 67.2% of the national electric production was coming from the Enterprise of Athens and 37.3% from the PPC. The average consumption in Greece was 167 KWh per capita, while in Athens it was 663 KWh per capita.

The wide expansion of radio and the absence of the washing machine are the most important data from this early era of electrification. Significant was also the presence of the electric refrigerator and the cooker, but in small quantities. Admittedly then, in the mid 20th century, the radio was the most massive urbanizing

technology in Greece. Sales rates of radios were bigger than any other technology, even than the rapidly growing sector of the electric refrigerators.

According to statistical data from the National Broadcasting Corporation, listed in the book of Kevork, Spartidis, Tzortzopoulos,[197] in the early 60's there were in Greece 81 radios per 1,000 inhabitants.

Shortly after its inception, and during the 1940's, and later on, the governments censored the radio. Apart from the EIR and individuals, the armed forces had installed five radio stations in northern Greece for anti-communist propaganda. Afternoon radio programs were including news, children's programs, classical and contemporary Greek and foreign music, plays, religious broadcasts, and educational programs focusing on women, farmers and other categories. Two of the stations of the army were relaying the Voice of America.[198]

Although radio had the largest sales, the electricity was much more desirable. The PPC was sending dealers to the villages of Macedonia and the rest of the country to make demonstrations of electric cookers and generally inform the villagers. Representatives of PPC were organizing speeches to the public and officers, usually in Sundays' concentrations in schools and cafes of the villages.

---

[197] *The demand for durable consumption goods. Econometric research.* Athens: Bank of Greece, 1964.
[198] Zaharopoulos T. "The Evolution of Public Service Radio Broadcasting in Greece: From Authoritarianism to Anarchy and Irrelevance", *Global Media Journal* (on-line journal), 2002, 1. Available at: http://lass.calumet.purdue.edu/cca/gmj/fa02/gmj-fa02-zaharopoulos.htm ; Zaharopoulos T. "The Rise and Fall of Municipal Radio in Greece", *Journal of Radio Studies,* 10 (2), 2003.

"People were listening, we were analyzing the price list, and then, we implemented this: For the small devices with the two stovetops, our representative who had them, was coming together, either in Serres it was, or if it was in Nafplio, we were saying, come on, the Siemens, the other one, the IZOLA, to give, to draw 3 devices for those present, to use them for a couple of days to see their use, and then go back to get them, but when you go to get them back, they can say that they want to buy it already".

"At the end, when the roast with potatoes was ready, we were handing it out as well... To see how fine the electric cooker cooks".[199]

With wise marketing and an economy price list the household electrification was being developed. In 1959, installments for different pieces of electric devices totalling 2.4 million drachmas had been paid through the PPC. The following year, installments of 4.2 million drachmas were paid for appliances; in 1961, 5 million drachmas, and in 1962, 5.7 million.[200]

[199] Interview with Dimitris Koletsos, to Maria Mavroeidis. Historical Archive of the PPC, Athens: 2003, pp. 17-18.
[200] Kevork, K.H., Spartidis, A.S. and Tzortzopoulos, P.T. *The demand for durable consumption goods. Econometric research.* Athens: Bank of Greece, 1964.

8. *The transformation of rural life*

During the first years of the effort to spread the use of electric cookers, the demand was limited, almost exclusively in Athens. The provincial Greece maintained a lower consumption of electricity for domestic use. The difference between Athens and the rest of the country appeared to be bigger in electricity costs for households. From 1969 to 1977, the average annual consumption for each household (KWh) had been as follows:

	Total	Athens and Piraeus	Rest of the Country
1969	874	1.668	420
1970	904	1.723	443
1971	971	1.839	484
1972	1.069	1.979	550
1973	1.160	2.060	637
1974	1.082	1.815	650
1975	1.156	1.886	719
1976	1.252	1.975	815
1977	1.337	2.046	906

Average annual household consumption (PPC, *General Budget 1978*).

The perpetuating situation was the same, as in the interwar period, when there was a big gap between consumption in Athens and in the provinces, as Evelpidis[201] and Vaxevanoglou[202] had emphasized. After 1958, the demand grows outside the capital, mostly in urban and semi-urban centers, while the countryside - villages of less than 2,000 people - showed no appreciable demand.

[201] *The electricity in the countryside*. Athens: Papazisis, 1943.
[202] *The social reception of innovation. The example of electrification in the interwar Greece*. Athens: Centre for Neohellenic Research of the National Hellenic Research Foundation, 1996.

The sales in electric cookers initiated in parallel with the increase in the number of subscribers in the price list T3, which facilitated the use of the electric cooker. In the magazine *IZOLA and Friends,* February 1954, we find an extensive list of shops "that sell products of IZOLA". In Athens, there were 95 stores with IZOLA devices, in Piraeus 53, while throughout the rest of the country there were only 15 representatives selling devices of that company. An innovative example of the expansion was the *Customers' Service Centers of IZOLA*, initially in Athens, Thessaloniki and Larissa, and later in several other areas.

The expansion of the telephone network in country started soon after the founding of OTE. In 1951, there were in Greece 536 telephone centers. From the creation of OTE to the end of 1962, the intercity and provincial calls multiplied more than seven times. Throughout Greece, a series of automatic urban telephone centers constituted the backbone of the national network. In 1962, 7 automatic rural telephone centers with a total capacity of 275 facilities, were installed for the first time in Greece. Overall, from 1950 to 1980, though many rural areas seemed that they were strongly absorbing new technologies, however, the uneven development became the main feature of the Greek regions.

The special interest of the Family Budget statistics is that among the households who agreed to participate in the survey, there were several households with a farmer as a leader of the family, especially in smaller towns.[203] Thus, not only the countryside was

[203] National Statistical Service of Greece. *Household Budget Survey, conducted in urban areas of Greece during 1957-1958.* Athens, 1961.

urbanized, but also the towns maintained a rural character. In 1963/64, the Household Budget Survey[204] was conducted in semi-urban and rural areas of Greece. Of the 3,755 households, which were included in the survey, 888 households were having a separate kitchen inside the residence, while 358 had a separate kitchen out of the house. 308 households had a draft kitchen out of the house, and 2,005 had the kitchen in another room. The most common means of cooking was firewood (2,611 households), while many households had an oil furnace (701) or gas (276). Only 26 households had an electric stove, and another five had an electric stovetop.

1,169 of the households surveyed had electric lighting. The most of them were using oil (2578 households) for lighting. The vast majority of farmers (1700 households) were using oil for lighting, while 482 of them had electric light. The majority of traders, office staff, managers, and employees in the armed forces, transport and communications were using electricity for lighting.

In the period 1964-1974, there was a significant rise in the percentage of households using electricity for cooking in urban (54.1%) and suburban areas (20.0%), but the electric progress was much slower in rural kitchens (from 0,4% at 3.7% in 1974). The most striking shift in rural areas during the same period it was from firewood to gas. While 80.3% of rural households using firewood in 1964, and only 3.8% having gas, ten years after, the percentage using firewood decreased to 8.5% and the percentage using gas

[204] National Statistical Service of Greece. *Household Budget Survey, conducted in suburban and rural areas of Greece during 1963-1964.* Athens, 1969.

was raised sharply to 86.4%. In 1974, the electric light was present in 95.8% of all rural households of the sample, while ten years before, the figure was only 19.7%. The increase was significant in semi-urban areas (from 58.4% to 97.6%). On the other side, urban electrification was completed.

In 1978, 12.2% of the total monthly purchases of professionals, scientists and senior executives were purchases of private cars, mileage and car maintenance. Office employees were spending 9.6% of their total monthly purchases for cars, traffic and car maintenance, while dealers and sellers spending 6.1%, artisans and labourers 5.5%. Instead, farmers were spending only 2.2% for cars.

In national level, the increase in the use of automobiles was very important. The annual rate of growth was 28% between 1960 and 1975. In addition, while, in the whole category of durable goods, the expenditure for cars was 2.5% in 1960, fifteen years later, in 1975, amounted to 21.6%. In the decade of 1960's the highway Athens - Thessaloniki had been constructed, with the advantage of a less mountainous route than the railroad of the 19th century. In 1962, there were 56,000 private cars in Greece. Thirty-five years later half a million.

The disproportion between Athens and provinces was significant in private cars. On December 31, 1973, in total 323,375 cars were registered across the country. The 64.28% of them were found in the Capital District (207,892 private cars).

Conversely, in some counties of the province the private car was very rare. In Evritania, in 1973, there were only 78 cars, in the prefecture of Samos 277, in Cyclades 452, etc.[205]

A notable initiative was the establishment of cooperatives of bus owners, while the state very early encouraged professional vehicles, excluding them from taxes. This way, the “rural” cars multiplied. Gradually, the car increased productivity in the countryside. In villages favoured by their geographical and economic position, like Ancient Corinth, cooperatives, since the mid 1950's, bought tractors and harvesting machines, and rented them to farmers, even from neighbouring villages, quenching thus purchase costs.

Moreover, the truck provided quick access to nearby markets. At the same time, the slow and gradual introduction of technology to the rural economy liberated workforce. In the decade of 1960, private purchases replaced the rentals of tractors, several villages filled with tractors, some villages got a cinema, and many rural homes acquired electric refrigerator and modern bathroom.

Nevertheless, there were also contradictions: In Thessaly, the harvesters were enabling farmers to avoid paying many wage-labourers. Thus, in conjunction with the protection in stabilized grain prices, mechanization prevented from growing cotton, which required a lot of wages, expensive irrigation, and risk with the fluctuating price of cotton.

[205] National Statistical Service of Greece. *Statistics of Communications and Transportation*. Athens, 1974.

Modernization of the Country

Around 1875, in the very early stages of agricultural modernization in 19th century Greece, the capacity of the rural economy included a large number of working animals, i.e. oxen (153,712), cows (37,120), buffaloes (230), mules (6358), donkeys (7453), horses (8152).[206]

The transformation of rural life progressed slowly. In the last decade of the nineteenth century, about 200 mowers, of various types were introduced in Thessaly. Steam ploughs had appeared for the first time in England, in the nineteenth century. However, in Greece, in 1893, we met steam ploughs, only in the village Akitsi of the province Almyros, adjacent to an Agronomic School. Even in the first half of the twentieth century, agricultural production was realized using mainly working animals: 719,237 in 1931, i.e. 357,625 oxen, 115,760 cows, 14,733 buffaloes, 76,386 mules, 154,733 horses.

According to the Census Bureau, even in 1961, in some areas of the country "there are groups of pastoralists, who, lacking usually some permanent establishment, move from the lowlands to the mountainous areas and vice versa, depending on the time of year".[207] Because these people were not residents of the communities in which they expected to be inventoried, and therefore, it would be possible to be omitted, the Census Bureau sought information about them and informed communities about the

[206] Kallivretakis, L. *The dynamics of the agricultural modernization in nineteenth century Greece.* Educational Foundation of the Agricultural Bank, Athens, 1990.
[207] National Statistical Service of Greece. *Results of the Agricultural-Livestock Census on 19th March 1961*, Vol. I. Athens, 1966, p. 22.

possible presence of nomads in their region during the time of the census:

> *The fullnames with some data related to the abode of a large number of nomads, known as Sarakatsanoi, who are considered as holding significant numbers of mainly sheep and goats, are listed in a special Survey on them [The "Sarakatsanoi", Volume I, Parts A and B by Angeliki Hatzimichali, Athens 1957]. The information about them was reclassified and passed to the communities likely to stay at. Such information was sent to a significant number of communities of the country.*[208]

The advancement of technology, however, forced the majority of the nomadic populations to abandon their perpetual movement and reduce their resistance to the public institutions; while an increasing number of rural households were compelled to import machines rather than beasts of burden. Nevertheless, the replacement of the working animals was a slow process, which in some areas, like Santorini, is not yet completed, until the 21st century.

The year 1961, in the extensive plain of Thessaloniki, with many rural, suburban and urban centres, a visitor would encounter numerous horses, donkeys and mules. Across the province of Thessaloniki, where, in that same year, there were 19,687 farms, according to the census, 13,546 horses, 932 mules and 5,626 donkeys. In the adjacent province of Langadas, totalling 13,472

[208] National Statistical Service of Greece. *Results of the Agricultural-Livestock Census on 19th March 1961*, Vol. I. Athens, 1966, p. 22.

farms, the number of horses was 5,210; the census of 1961 found also in Langadas 1,655 mules and 8,523 donkeys. Rural communities using working animals coexisted with the most modernized farms.

Another conclusion drawn from the tables of holdings, is that the farms, at least temporarily, were more numerous in lowland and populous prefectures, especially in those with large urban and self-sufficient semi-urban centres, usually near key transportation points, e.g. in Litochoro, Pieria, one encountered 800 farms in 1961.

Multi-employment also seemed to favour the fragmentation of land. For example, the historical community of Sykia in Sithonia was gathering 558 farms. By contrast, a larger residential division was reducing the number of farms around small clusters of houses, as in Hanioti, Cassandra, with 55 farms. The majority of the farms, in 1950, were found in Macedonia (277,650), in Peloponnese (274,060) and in Central Greece - Evia (202,283). The farming families totalled 243,382 in Macedonia, 184,175 in Peloponnese and 154,234 in Central Greece and Evia. In Thessaly, one found the greater average surface area per farm (5.54 hectares). Next were Thrace (4.32 hectares), Central Greece and Evia (4.02 hectares), Macedonia (3.8 hectares) and Peloponnese (3.25 hectares).[209]

In every province of the country, in 1950, farmers were using numerous (157,966) horses and mules (96,835), mostly in the prefectures of Larissa, Aetolia-Akarnania, Elis, Fthiotis, Karditsa, etc. In a few areas, such as in Arcadia, working mules (11,595)

[209] National Statistical Service of Greece. *Results of the Agricultural Census in the year 1961.* Athens, 1958, p. xvi.

outnumbered horses (6875). The most common pulling animal was donkey (468,295 across the country). However, the number of draft animals reduced in the next years.

1. *The national system of production and transports*

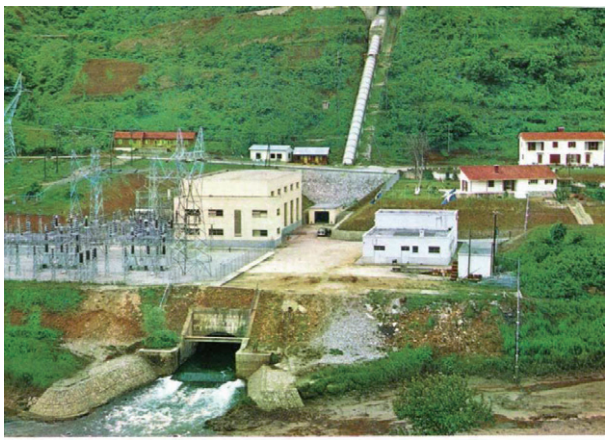
With electrification, the countryside became increasingly important for the Capital City of Athens. In the fiscal year 1952-53, the first unit of the Steam Electric Plant of Aliveri came into operation, altogether with the 150,000-volt transmission line Athens-Aliveri and the transformation substation in Rouf, Athens.[210] Furthermore, the biggest part of the transmission system had been built; while the plans for the primary distribution network (15,000 volts) were carried on.

In late May 1952, the transmission line Agra-Thessaloniki completed, whereas the works for the transmission lines Aliveri-Rouf, Rouf-Patras, Corinth-Ladon, Megalopolis-Kalamata, Kavala-Thessaloniki and Schimatari-Lamia were going on. That same year, construction works continued in the transformation substations 150.000/15.000 volts, as well as on the works in Aliveri mine, which fed then exclusively the Steam Plant of Aliveri. The expropriation of the electrical production and distribution facilities in Thessaloniki, from the old state company of the Trams and Power of Thessaloniki, had also started.

[210] Public Power Corporation. *Annual Report in the Fiscal Year 1952-1953.* Athens, 1953, pp. 12-13.

On the opening day of the Public Power Corporation (PPC) there was a testing operation of the No. 1 unit of the Steam Plant of Aliveri, but the transmission facilities was not yet completed. When the transmission line completed, the first customer of PPC was the Electric Company of Athens – Piraeus. The PPC started supplying the Athens – Piraeus Company on July the 2nd, 1953.

On December 13, 1953, the PPC began supplying the hydroelectric company "Glaucus" of Patras, the first provincial town receiving electricity from the Public Power Corporation. The main lines and facilities constructed in the area were leased to the company with "on a temporary monthly basis" contract.[211] In the coming years, the Hydroelectric Plants in Agra, Louros and Ladon started. In 1954, the branch-line to Edessa was ready and would be channelled with electric current just when the Agra Plant opened.



ΑΓΡΑΣ—1954

[211] Public Power Corporation. *Annual Report in the Fiscal Year 1953-1954.* Athens, 1954, p. 64.

In 1954, the main lines of 15,000 volts in Serres region also completed, and were to be connected just when the Serres substation opened. The works on the main and branch lines of the distribution network continued in Kavala but because of scarcity of materials, only 15% of them completed.

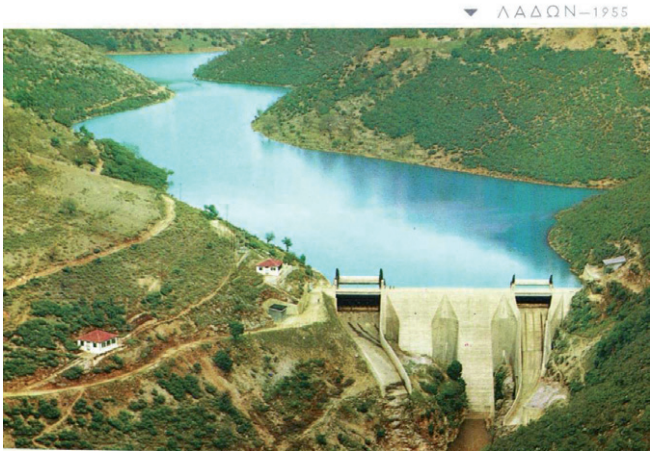
Significant causes for the delay in the construction of the distribution network were difficulties in supplying maps, lack of several vehicles, delays in credit adoptions for the procurement of vehicles, topographic instruments and equipment necessary for the planning of the 15,000-volt lines. Another early obstacle was the lack of customers. In 1954, the administration of PPC observed:

> *In Macedonia and Thrace, the main 15,000-volt lines, in the region of Agra, completed, as well as the 380/220 volts subnet in the village of Agra, but no customer has yet proceeded in the necessary inner installation in houses or shops.*[212]

One of the priorities, soon after the establishment of PPC, was the connection and unification of the northern transmission system (Agras - Kavala) with the southern branch (Ladon, Patras, Athens, Corinth, Aliveri, and Larissa). In the vast rural areas, the planned Hydroelectric Station in Kremasta and the Thermoelectric Station in Ptolemais would dominate. This is why the PPC designed the unifying Agra-Larissa line in order to link the electric production of Ptolemais with the national system.

[212] Public Power Corporation. *Annual Report in the Fiscal Year 1953-1954.* Athens, 1954, p. 64.

Important projects in the countryside were also the Hydroelectric Station in Megdovas (Tavropos) and the expansion of the transmission network, e.g. from Ladon to Pyrgos, etc.



The PPC encountered difficulties with the large constructions built in the mountainous hinterland, mainly with the Vegoritida and Ladon tunnels. Nevertheless, despite the “extra violent” reactions by private interests, according to the report of the Board, the function of the PPC moved with sound footing, and the company was then beginning to perform new works based on their own resources.

> *Our country’s need to supply electric energy for the industry and to expand the distribution network deep in the countryside is for Greece an issue of survival.*[213]

[213] Public Power Corporation. *Annual Report in the Fiscal Year 1953-1954.* Athens, 1954, p. 12.

In 1954, the preliminary list of towns and settlements that were included in the electrification program was expanded: 6 settlements were added in the Agra substation, 2 in Thessaloniki, 14 in Serres, 2 settlements in Kavala substation, 7 in Chalkis (Cement Factory), 1 in Copais, 2 in the new substation at Schimatari, 16 in the substation in Corinth (Examillia, etc.), 6 settlements in the substation at Aigion, 3 in Patras substation and 8 in the substation at Louros.

On March 19, 1954, the PPC put into operation the Hydroelectric Station at Louros, supplying with electricity the cities of Ioannina and Arta, and intermediate communities through the primary distribution network (15,000 volts). The Greek Electricity Company of Ioannina began receiving electricity from the PPC. In May of the same year, the Electric Company of Arta was also connected with the network. Then, in June, the first houses of the village Agios Georgios in Epirus, which previously had no electric lighting, were attached to the grid.

On 30.6.1955, the number of towns and villages connected directly or indirectly with the National Network of PPC were 180, out of which, 150 saw for the first time electric light. On the same date, the number of the retail sales customers of PPC amounted to 9,326, including 1,712 customers served by the electric companies in Patras and Aigion.

In 1955, after the completion of the projects in Aliveri, Ladon, Agras and Louros, the per capita electricity production had risen to 200 KWh, while in the U.S. it was about 3,000, in Britain around 1500, and in Italy 800.

The new program provided for increased consumption in cities and rural areas, and promoted the works in Megdovas, Ptolemais and Kremasta.

1.1. *The first decade of the PPC*

The first years after the civil war, the administration of PPC was granted to executives from the U.S., which intervened for network expansion. In 1954, the Community Pantanassa in Arta had sent a letter to the Regional Division of PPC in Patras, requesting the extension of the network to their village. On September the 6th of 1954, E. A. Morgan, Regional Manager at Patras, replied to the request of the President of the Pantanassa Community that the village is not included in the first stage of the construction, because it would not be economically feasible to spend the funds for building the necessary facilities to supply electric service in the village.[214]

The first stage of the project would be completed in 1955. After its completion, if conditions were favourable, it could be a new investigation to determine if the load is sufficient to justify the construction. However, the village community had also sent a letter to the King Paul, where they said:

> *Our Community, Pantanassa, Filippiada, is only ten minutes distant from the Louros plant. The Factory is located in the rural area of our Community and we have sacrificed several hectares of forage*

[214] Public Power Corporation, Electric Power Division, Letter to the President of Pantanassa Community (6 Sept. 1954). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

area for the execution of the project... Furthermore, during the course of the three-year implementation of the Project, the inhabitants offered their work tirelessly.[215]

C O P Y

Pantanassa, September 25, 1954.

To: H.M. The King of the Hellenes
Athens.

Majesty,

Our Community "Pantanassa-Philidos" is only ten minutes distant from the Ladhrom plant. Many stremmas of our lands were sacrificed for the construction of the project in question.

The original program for the supply of power, as published in the Greek press, included our Community among the first to be supplied. While the neighboring Community of St. George was supplied with power from the very beginning, six months have elapsed since the beginning of the commercial operation of the plant and we see no attempt at constructing the necessary installations in order to supply electric energy to us.

We have forwarded a relevant application to the P.P.C Office in Patras, which informed us, in reply, that our Community will not be supplied with el. current because this is anti-economic.

Even if it were anti-economic, we should have been granted the privilege of receiving electric service since we have sacrificed so much land for the sake of this project. As the distance from the center of our Community to the Arta line is hardly one kilometer, only ten poles would be required and there would be no further expenditure required. If we got electric service we could irrigate our lands, and thus raise our standard of living. We cannot imagine that such a project has been executed only for profit, while its main object should be one of bringing civilization to all undeveloped districts.

Your Majesty is respectfully requested to have pressure brought to bear on the competent Ministry in order that P.P.C be urged to do the necessary for duly supplying our Community with electric energy.

Very respectfully yours

The Inhabitants of the Community of
Pantanassa.

(Follow 75 Signatures)

The original program of the network included also Pantanassa, which is very close to the factory. While the neighbouring village of St. George, where the dam was built, had been supplied with

[215] Community of Pantanassa, Letter to the King Paul (25 Sept. 1954). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

electricity from the outset; while all the other machinery and the factory were located in Pantanassa, the entire half year had elapsed since the plant operates and no installation for the delivery of power to their Community had been made. The Community was marking as “unfair and unjust” the decision of the PPC Division in Patras to exclude their village from the electrification program for economic reasons.

The distance from the village to the Arta line was hardly 1 kilometre, so 10 poles would be enough to connect. The residents were adding that the PPC should act with the civilizing as a priority, not profit.

Ordered by the PPC Directors, following the intervention of the King and the pressures by the Community, E. A. Morgan replied on November 11, 1954, that, the day before, he had visited the village and talked with the President Mr. Nicholas Nastos and the priest.

> *The village has a population of approximately 445; it consists of 85 houses of which 10 are mud huts. A new school has been started but may not be completed for a long time. There is no industry in the village and there are no wells. The president estimated that 70 houses would install two lamps each. He also indicated that if electricity was to be made available, a pump would be installed at the foot of the mountain along the Louros River to supply the village with water. There is one flourmill operated by water wheel at the foot of the mountain. The*

proposed pump was estimated at 15 HP and the flourmill could be served by a one-pole extension.[216]

PUBLIC POWER CORPORATION
ELECTRIC POWER DIVISION
57, Hermes Str., Patras
INTER - OFFICE MEMORANDUM

TO: Mr. E. R. Woolley
FROM: E. A. Morgan
DATE Nov. 11, 1954
SUBJECT Pantanassa.

In response to your memorandum of Oct. 29, 1954 I visited Pantanassa on Nov. 10th and talked with the president Mr. Nastos Nickolaos and the village priest.

The village has a population of approximately 445, it consists of 85 houses of which 10 are mud huts. A new school has been started but may not be completed for a long time. There is no industry in the village and there are no wells. The president estimated that 70 houses would install two lights each. He also indicated that if electricity was to be made available a pump would be installed at the foot of the mountain along the Louros River to supply the village with water. There is one flour mill operated by water wheel at the foot of the mountain. The proposed pump estimated at 15 HP and the flour mill could be served by a one pole extension.

The main village, located on the side of a mountain a short distance to the southeast of the Louros Plant is spread out over a wide area. However, it is estimated to be only a kilometer from our 15 kv Arta line but it would take a lot of secondary construction to serve the 70 houses.

There is a bitter feeling over the fact that much of their land was taken for the site of the Louros project also that their supply of water for the operation of their mill has been materially reduced due to diversion of the waters of the Louros River, and now they cannot even get electricity.

If the village proper is to be served it will only be done to heal the wounds of the inhabitants, for the cost could not be justified if it were to be based on the prospective load.

So far as the pump and flour mill along the river are concerned, service can be given whenever they are ready to take it.

E. A. Morgan

EAM/il

The main village - Morgan continues his description - is located on a mountainside a short distance to the southeast of the river Louros and covers a wide area. The American director estimated that Pantanassa is only one kilometre from the 15 KV line of Arta,

[216] Public Power Corporation, Electric Power Division, Inter-Office Memorandum, From E. A. Morgan to E. R. Wooley, "Pantanassa" (Nov. 11, 1954).). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

but would require several secondary constructions to serve 70 houses. He was adding that there was indeed “a bitter feeling over the fact that much of their land was taken for the site of the Louros project”; moreover, there was a substantial reduction of the water available for the operation of their mill, due to the diversion of the waters of the river Louros and now they could not even have electricity. Another executive of PPC, W. G. McKay, was estimating that the ratio of expenditure for constructing a line to Pantanassa, to the anticipated revenue was 9 to 1. However, if they installed the pump, the ratio (4:1) would have been conformed to the PPC policy of business expansion.

On 24 February 1955, the General Director of PPC Mr. Breckenridge replied to Mr. Koutsalexis, manager of the Royal Office, that the possibility of electrifying Pantanassa would be very carefully handled. Soon there would be electricity for the village pump and mill.[217]

In fact, the managers of PPC, such as Morgan, considered the investment expensive, and therefore recommended to limit the projects to the pump.[218] Interestingly, the estimated costs of labor and materials for electrifying Pantanassa at the end of 1954 were about 160 thousand drachmas. The primary network, 1 kilometre long, costed 50 thousand drachmas. The secondary network, 2 kilometres long, 90 thousand drachmas. The transformer would cost

[217] Breckenridge, H. K., General Manager, Letter to Mr. Koutsalexis, Plenipotentiary, H. M. The King’s Private Office (February 24, 1955), Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[218] Public Power Corporation, Electric Power Division, Inter-Office Memorandum, From E. A. Morgan to W. G. McKay, “Pantanassa Community” (Jan. 27, 1955), Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

20 thousand drachmas. An additional cost of 31.5 thousand drachmas related to services and measurements.[219] Nevertheless, the financial aspect was not always decisive against the public enthusiasm with the new technology.

The reception of electricity by the residents was often delirious as in the village Giannouli, Larissa:

> *And we went over there for the inauguration; they lifted the switch and lit up the village; "the PPC", they encountered us as saviours: "The PPC arrived!" There was no village among those we visited by the car - which we had rented as "Omnium Lyonnais" – where they did not tell us "sit down to offer you, to cater you, to treat you". Always. The PPC possessed a charm, a resonance, and indeed our work was very important. Otherwise, they would not have electricity; until then, they had wicks, candles and oil lamps.*[220]

For the Community Kampi, Arta, the PPC conducted, in 1956, an Overview Survey of the Village, according to which the Community had 853 residents, 172 families, 180 houses and 10 shops. In Kampi, the stone-built construction type of houses was prominent. The basic line involved in this connection was the Louros-Arta line, 15 KV. The main local products were agricultural and livestock. The Community Budget in 1955-56 was 100,000 drachmas. The PPC

[219] Public Power Corporation, Electric Power Division, Inter-Office Memorandum, From E. A. Morgan to E. R. Woolley, "Pantanassa Community" (Dec. 6, 1954). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[220] Isaac Levy's Interview to Maria Mavroeidi (9.6.2003). Verbal Historical Archives, Organization Division of PPC, Archives Sector, 1st Tape, p. 25.

estimated that the annual consumption in Kampi would be 17,707 KWh, i.e. 40,941 drachmas. The cost would come to 326,800 drachmas. This meant that the rate of return would be 1/7.95. Thus, the Kampi Community had to pay 80 thousand drachmas participation to the construction costs.

The PPC informed the Community for the required participation fees, proposing the payment in five yearly interest free instalments. At the same time, the PPC urged the Community to the signing of the contract, leaving open the possibility of adjusting the participation fees, depending on the survey results. If, however, the revenue from electricity consumption were higher than the estimated, the Community contribution would be reduced accordingly.[221]

Indeed, on 13.9.56 the Kampi Community Council met to decide their participation to the "necessary electrification expenses" of 80,000 drachmas. However, the situation had already changed dramatically, with the implementation, after 1 August 1956, of the single price list for the entire mainland Greece and Evia.

Under the new price list, the revenue from the sale of electricity to the Kampi Community would fall so low, that the final participation fee amounted to 230,000 drachmas. The Kampi Community was unable to proceed by the due date (30.11.57) to sign the contract and pay the first instalment, so the connection to the network was postponed.

[221] Public Power Corporation, Regional Division of Peloponnese-Epirus, "Community Electrification" (12 May 1956). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.

Furthermore, in November 1958, the Director of Distribution's Utilization, Mr. Apergis stated that the construction cost was disproportionate and its realization was not feasible in the near future.[222]

In 1959, the President of the Kampi Community, Christodoulos Dimos, repeated his request to know when the village will be electrified, and how much money should collect to have electricity soon. The Director of Distribution's Utilization, Mr. Apergis replied on 14 July 1959 that Kampi's electrification falls within the general program, but not in the program of the current economic year.

> *In case your Community wants this year the advancement of the issue of electrification, the whole expense, necessary for this work, should be payable to us at once, which is 500,000 drachmas.*[223]

Finally, on July 13, 1960, Mr. Apergis informed the Kampi Community that the company decided to extend their electric distribution network, during 1960, to Kampi Community. The PPC, knowing that some communities lack financial resources to carry forward their participation to the cost of electrification,

> *decided to proceed in this extension without advance payment for participation, but provided that your Community will accept that their people will*

[222] Public Power Corporation, K. A. Apergis, "Kampi, Arta, Community Electrification " (17 November 1958). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.
[223] Public Power Corporation, K. A. Apergis, "Kampi, Arta, Community Electrification " (14 July 1959). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.

contribute with personal work to the expansion works and specifically that you will undertake the drilling of the pits for the placement of the poles and their buttresses.[224]

For the remaining cash amount of participation, they would find ways, in consultation with both the PPC and the Ministry of the Interior, which was subsidizing the Communities. Therefore, with the personal work of Kampi residents, on 9.8.61 the village was linked with the grid.

1.2. *The rapid expansion of electricity in rural areas*

As the pioneers of electrification narrate, the PPC offered to the inhabitants of the Greek countryside an inexpensive and attractive unified price list and satisfactory conditions of integration to the network:

They turned on the switch. First, the PPC gave them light, yes. Then the light was cheap, it costed one drachma and ninety cents. In addition, the more you consume, the less the price (...)

... and the plant in Volos closed because they put a transformer from the outside and brought electricity

[224] Public Power Corporation, K. A. Apergis, "Kampi, Arta, Community Electrification " (13 July 1960). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.

... and everywhere was so: in Larissa also the same and in Trikala the same.[225]

According to Isaac Levy, who worked on the expansion of distribution networks, the first big step of PPC was the cheap price list:

All Greeks paid one and ninety. Private companies were also subsidized for the difference, if yesterday they were selling electricity at rates approved by the Ministry of Industry or at one and ninety; this was subsidized by the PPC. They were taking the difference in electricity's prices; if they existed, i.e. they had not been redeemed by the PPC. That is, the municipal company, the factory at Syros said: "If I was selling the electricity, I would get one hundred thousand drachmas. But now I charge the customers with the one and ninety of PPC, obtaining fifty, forty thousand". The rest was given by the PPC... In Didymoteicho, say, they paid seventeen drachmas per KWh. How could they spend? They had fifteen volts lamps. Electricity costed enormously. In Didymoteicho once, I had the funniest memory: woods taken from the surrounding forest, made by wooden poles, made the network in Didymoteicho

[225] Isaac Levy's Interview to Maria Mavroeidi (9.6.2003). Verbal Historical Archives, Organization Division of PPC, Archives Sector, 1st Tape, p. 25.

and they used, in a considerable measure, old galoshes as insulators.[226]

Apart from the introduction of the cheap tariff, the second big step was the expansion of the distribution network in the entire Greece, for example, during Zigdis' ministry, with the establishment of the Islands Region.

As it seems, the delays in network expansion were seriously employing the PPC and its employees. One of the exam topics upon which the PPC screened the candidate commercial representatives was "The influence of electrification on urbanism and general demographic problem in the country". Optimism prevailed, however, just as when the representatives of PPC left behind them the village Petritsi electrified:

... I was driving back to Serres, I turn and look back to the illuminating mountain, anyway, and I say that now our northern neighbours will not be able to claim that they have electrified villages and we do not.[227]

In 1960-61, the company announced an electrification program throughout the four years 1960-63, which covered 1129 villages. The program was carried out only at about the half, while the rest part was cancelled.

[226] Isaac Levy's Interview to Maria Mavroeidi (9.6.2003). Ibid., pp. 33-34.
[227] Dimitris Coletsos' Interview to Maria Mavroeidi (9.12.2003 and 23.3.2004). Verbal Historical Archives, Organization Division of PPC, Archives Sector, 1st Tape, p. 15.

The PPC organized in towns and villages demonstrations of electric devices to inform the public and promote electrification, e.g. in the mid 60's, television and other devices were exposed in Platanos Square (Constitution) in Nafplion.

To test the feasibility of village electrification, the officials were jointly examining "an economic-technical pre-investigation, after scribble, an overview survey of the village and a consumption calculation table".[228] In the case of the village Triadi, for instance, the network construction cost in 1960 amounted to 346,881 drachmas, while the revenue in four years would be 72,932 drachmas, and the correspondingly resulting financial participation 273,949 drachmas.

The President of the Community was stating, however, that they had only 100 thousand drachmas, which could be paid in two instalments. PPC's answer was that the Triadi Community could pay a 250,000 drachmas participation in five equal annual instalments.

On May 17, 1962, PPC informed the National Broadcasting Corporation which cities and villages were connected with their networks in the months March and April of that year.

At the same time, the PPC purchased the private companies serving Kamatero, Kouvaras, Agios Stefanos, Ambelakia in Salamis, Acharnais, Skopelos, Argostoli, Zante, Gavrio in Andros, and also Fry, Agia Marina, Arvanitochori, Panagia and Polion in Kasos island, etc.

[228] Public Power Corporation, Regional Division of Macedonia-Thrace, "Electrification of the Settlement Triadi in Thessaloniki Region" (16 May 1960). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

An account of the year 1962, in handwritten text, recorded 177 new settlements integrated to the grid, 136 electrified villages for the first time (of which 38 border), and 41 previously serviced by electric companies. That same year the PPC purchased 25 electric companies in the following areas:

Korissia, Kea	Kythnos	Dryopis, Kythnos	Sifnos	Vrondades, Chios
Kasos	Skopelos	Gavrio, Andros	Argostoli	Zante
Pigadia, Karpathos	Kardamena, Kos	Molyvos, Lesvos	Ag. Georgios, Lassithi	Pythagoreion, Samos
Cleo, Lesvos	Parakila, Lesvos	Petra, Lesvos	Thrapsano, Heraklion	Anemotia, Lesvos
Kalloni, Lesvos	Kalamoti, Chios	Astypalaia	Eressos, Lesvos	Skalochori, Lesvos

PPC, "Electrifications of new villages, redemptions of electric companies, etc." (4.1.63).

In 1962 also, the electrical companies based in Filia, Vrisa, Vatousa and Mantamado (Lesvos), in Kerpini (Kalavrita), Potamos (Kythira), Batsi (Andros), Vanato (Zante) and Pyrgi (Chios) were redeemed but not acquired by the PPC.

In addition, a series of other electrified towns connected to the National Electric Grid or with islets of the network, e.g. Ag. Myron in Heraklion, Filiatra, Galaxidi, Pteleos in Magnesia, Villia in Attica, Oropos, Palea and Nea Epidaurus, Gytheio, Soufli, Axioupoli in Kilkis, Distomo in Boeotia, Pyrsogianni in Ioannina, Komotini, Nafpaktos, Velvendos, Pylos, Zacharo, Orestias, Gargaliani, Aridaia, Moustheni in Kavala, etc.

In 1962, the customers increased by about 70,000, of whom 55,000 were domestic.[229] At the same time, PPC sought to *consolidate* its control upon any electric activity throughout the country.

In February 1963, Mr. K. A. Apergis, Utilization Director, sent a letter to the Legal Counsel of the PPC Utilization Division, to inform him that in various parts of the country electric-lighting installations had begun to operate without a license, usually constructed by agricultural, olive oil or similar cooperatives, but also by the communities themselves.

Because, as Mr. K. A. Apergis stated, the competent authorities did not interrupt the illegal electric-lighting activities, that phenomenon was being generalized (Steni in Evia, Theodoriana in Arta, Abdou in Heraklion, Stavrochori and Zakros in Lassithi) and cooperatives of Crete, especially Heraklion, were planning electric-lighting works.[230]

In mid-1960, electric lighting was one of the basic consumption needs. Access to the good was also a demand by many of the tourists who visited Greece. On regard of this concern, a letter from the Director of Distribution's Utilization is revealing, for the response to the questions of an American woman who lived in Chicago:

> *In reply to your letter on 4.2.66, relating to the captioned matter [Electric-Lighting Islands], we have*

[229] PPC, "Electrifications of new villages, redemptions of electric companies, etc." (4.1.63). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.
[230] Public Power Corporation, K. A. Apergis, "Unauthorized Community Electrifications" (12 Feb. 1963). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.

the honour to let you know that almost every settlement on the islands Skyros, Skopelos, Skiathos, Paros and Naxos are electrified by alternating current 220 / 380 V.

In the island of Ios there is no electric power today, but later this year the local power station will be installed and operate for the electrification of the settlements on the island.[231]

The U.S. citizen was planning to visit Greece and had sent a letter to PPC, advised by the Greek Consul in Chicago, to ask if there is electricity in the islands above mentioned. She also requested to know if there was electricity available in all accommodations on the islands, or if there was need for generators.

Tourism was a fixed parameter in the feasibility assessment of an application for electrification. For example, in 1963, the beach Karfas in the Community Thymiana, Chios, although not included in the electrification program of that year, "because of the very bad indices of profitability for the necessary extension of the network", it could be electrified as a priority, because it is a resort. For the unscheduled electrification of the beach Karfas, firstly, the total cost of the project had to be covered at once (about 450,000 drachmas).[232]

[231] Public Power Corporation, Utilization Director K. A. Apergis, "Island Electrifications" (8.3.66). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.

[232] Public Power Corporation, "Expansion of Distribution Networks" (17 July 1963). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.

The provincial PPC grid was gradually developed. In 1964, the PPC served, apart from Sparta and Gytheio, 25 other towns and villages.

Furthermore, within the same year, the villages Anogia, Palaiopanagia, Petrina and Gefyra in Monemvasia would be electrified. On the contrary, even in Attica, in 1964, there were big settlements, such as Stamata, waiting in vain for their inclusion in the program, because the Community of Stamata had not accepted to pay their contribution to the cost.[233]

In western Greece, the Management of PPC located in Patras, supervised the electrification procedures in Peloponnese and Epirus. From PPC documents, we realize that a large number of customers were not an exclusive criterion for connectivity.

With this generally open electrification policy, in February 1966, 2 customers at Sykies-Arta, 30 at Metaxata, 31 at Kaligata and 48 at Kourkoumelata-Kefalonia connected with the network; while in March 1966, 20 customers connected in the village Katastari and 4 in Pigadakia-Zante, etc.[234]

In some other cases, the postponement of electrification was based exactly on the small number of residents and the long distance from distribution networks, as happened in 1971 with the settlement Kalyvakia, in Karitena Community, Arcadia.

[233] PPC, Note to the Minister of Industry (24.4.64). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.
[234] Public Power Corporation, Regional Division of Peloponnese-Epirus, "New Settlements Electrification" (12-3-66). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.

Because the PPC felt that the costs were too high, they were delaying the electrification of remote small villages to the next programs. In several other cases, a village failed to pay the amount for the participation in the construction costs of the line. In 1971, the PPC accepted, under certain conditions, that communities pay the amount in 24 bi-monthly and interest free instalments, as shown by documents concerning, among others, the settlements Paralia Irion, Argolis and Agrilia, Messenia.

A table of 1966, found in the Central Archives of the PPC, includes 83 Community names which "occasionally after relevant request were electrified in priority and out of the program".[235] In this table, the total Community contribution and any amount that may not have been paid were mentioned.

According to these data, the following Communities had a broad participation in the cost of electrification: Atalanti Fthiotis (1,300,000 drachmas), Marathon Attica (1,061,000 dr.), Karyes Laconia (1,200,000 dr.), Flabourari Ioannina (750,000 dr.), Malesina Fthiotis (700,000 dr.), Skyros (700,000 dr.), Falani Larissa (675,000 dr.), Avlona (670,000 dr.), Delvinaki Ioannina (650,000 dr.), etc. These delayed debts were, in some cases, quite high: 1,040,000 drachmas owed by Atalanti, 560,000 dr. by Malesina, 440,000 dr. by Livanates Fthiotis, 440,000 dr. by Krinides Kavala, 438,000 by Marathon, 380,000 dr. by Karyes, etc.

[235] PPC, Informative Note to the General Director: "Communities Debts for their prioritized electrification" (12.4.66). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.

Many times the electrification of a settlement was gradually completed; sometimes the extension of a network involved one or even a few more posts to get the electric current to the new consumer. In the villages of Nafplion, there was an orgasm of electrifications, but in one of the tours made by the representatives of PPC, an impatient villager reacted violently:

> *There, someone, some time, comes from the outside with a carbine, say, threatening to break us all, because we do not give him electric power to the orchard.*[236]

The needs were often professional, such as an electric refrigerator, which was reaching then some rural villages, with tardiness. For example, in 1964, the electrification of Nicholas Roussos' Coffee Company, in Limnes, Evia, was postponed, although related to the operation of a professional fridge. The Coffee Company had to wait for a broader program for the renovation of the old network in that region. In the same document, the PPC refers to the restoration of a breakdown in a bakery business in Stylida. Moreover, it refers to an electrification request for a car wash, along with 22 houses in the area of Trikala. The local politician K. Dervenagas mediated that application, but the refusal to pay their participation (20,000 drachmas) in electrification costs had postponed the expansion of the network.[237]

---

[236] Dimitris Coletsos' Interview to Maria Mavroeidi (9.12.2003 and 23.3.2004). Verbal Historical Archives, Organization Division of PPC, Archives Sector, 1st Tape, p. 13.

[237] Public Power Corporation, Letter to the Minister's of Industry Office, "Electric-Lighting Issus". Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, EM 1001, Envelope 203.

Another document of the Central PPC is the Deputy's General Director, Mr. Flampouriaris, reply to a letter from the American Embassy (3.5.62) calling for information about the characteristics of electricity in various Greek cities. In 1962, as mentioned in the list contained in the letter, the network supplied DC to Aidipsos, Argostoli, Hydra, Ithaca, Lefkas, Skiathos, Spetses, Tinos, etc.

1.3. *From Eleousa to the PPC*

Immediately after the establishment of PPC, numerous communities began to send petitions to the company and the state, asking to be electrified. In 1955, the communities Xiloupolis, Lahanas, Kydonia, Vertiskos, Ossa and Nicopolis, in Thessaloniki prefecture, and the communities Lefkochori, Elliniko, Melanthio, Theodosia and Isoma Kilkis had sent a joint memorandum to the Ministry of Industry for their electricity supply. The Ministry sent the memorandum attached to the PPC and the company replied that they would examine the possibility of electrifying those communities.

On 4 January 1959, the President of the Eleousa Community in Thessaloniki addressed a letter to the "Public Electro-lighting Enterprise of Thessaloniki" stating that he agreed with the budgeted cost for a scheduled electrification plan for "seven (7) Communities, namely: 1) Lianovergi - Palaiochori, 2) Platy, 3) N. Zoi - N. Monastiri, 4) Adendro, 5) Partheni, 6) Eleousa - Valtochori and 7) N.

Chalcedon".[238] The PPC, in order to assess the conditions for electrification, was conducting an overview survey of the village that included general information, an annual revenue budget and a consumption calculation table.

For example, in the case of Kolchiko, Thessaloniki, the PPC compiled a Survey Overview, in 1957, according to which the inhabitants of the village were 1,700, the number of families 480, of houses 400, with 15 shops and 2 manufactures (mills).[239]

Kolchiko is a concentrated village, situated in plains; in those times, it had stone houses. The main products were cereals, tobacco, cotton and vegetables. The PPC technicians budgeted that most of the annual consumption in Kolchiko would involve lighting and domestic use (39.100 KWh). Consumption for lighting the shops was forecasted to reach at 3.000 KWh per year; for street lighting 6.800 KWh; for industrial use 14.850 KWh. The total annual revenue of the PPC would be 96,750 drachmas. Kolchiko, however, waited to be electrified much longer. In June 1962, the Distribution's Utilization Division informed Regional Division of Macedonia - Thrace that the electrification of the villages Cavallari, Kolchiko and Assiros was not expected to become feasible in the near future. In October 1966, the Community wrote to PPC recalling their tardiness to conduct the plan of the village electrification.

[238] Eleousa Community to the Public Electro-lighting Enterprise of Thessaloniki, "Request to include the Community of Eleousa in the electrification program of 1960". Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[239] Village Survey Overview (Kolchiko). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

In 1960, the Kardia Community seeking to succeed in their electrification request, was raising the plethora of shops, manufactures and public buildings housed in the village: flour mill, blacksmith shop, seven cafeterias, two barber shops, five groceries, one agricultural cooperative warehouse with an office, a primary school with two offices and halls, a church, a community house and a kiosk. The author has provided even further after the electrification of the village:

> *Besides, the inhabitants, over time, the professions and the resorters will acquire electric refrigerators, electric stoves; all residents will obtain radios and electric irons. I present an attached affidavit signed by the heads of families that they will install electrical current to their houses.*[240]

Regarding the costs of the economic-technical study for the electrification of a village, we know that the communities paid to PPC amounts for the elaboration of the survey. For example, according to a PPC document dated on 12 January 1957, the Community of Kato Scholari, Thessaloniki, "accepted to pay their 353,000 dr. participation fees, notifying together the related decision of the Community Council..."[241] The next year, namely on 15 September 1958, the PPC assured that the electrification of Kato Scholari "falls into the framework of the under implementation electrification program of the country, upon which, the time that it will

[240] Kardia Community, Letter to the PPC (8 April 1960). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[241] Regional Division of Macedonia-Thrace, "Electrification of the Community Kato Scholari, Thessaloniki". Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

take place, will be conditioned".[242] On 24 August 1959, the Community of Mesimeri requested, with a letter to PPC, the electrification of the village. "It's very sad to be situated at a minimum distance from the last electrifying pole and not having light ...",[243] remarked the President. In February 1960, the Community sent a renewed memorandum to the PPC to recall the electrification issue of the village.

"Great the desire of the residents for the illumination of their houses", wrote the president, highlighting the concerns for the presentable appearance of a village near the second capital of Greece. Later, in April 1960, the PPC announced the results of the "techno-economic pre-study" for the cost of electrification of the villages Kato Scholari and Mesimeri. The cost of implementation of the project would amount to 1,650,000 drachmas, while the expected annual revenue from electricity consumption was 100,000 drachmas.

To proceed to the electrification of the villages, the PPC was asking for an *efficiency index*, i.e. the ratio of the expected annual revenue to the expenses, not less than 1:6. If the efficiency ratio was smaller, then village had to pay the excess in five annual, interest free, equal instalments. For the villages Mesimeri and Kato Scholari the return index was 1:16.5 and the PPC would electrify them if they agreed to pay the sum of 1,050,000 drachmas (divided to 550

[242] Public Power Corporation, "Electrification of the Community Kato Scholari, Thessaloniki", Letter to the General Division of the Ministry of Industry. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[243] Mesimeri Community, "Electrification of the Mesimeri Community" (24 Aug. 1959). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 69.

thousand for Kato Scholari and 500 thousand for Mesimeri), in five annual, equal, interest free instalments.[244] However, after 8 years, electricity had not yet reached Kato Scholari. The Community President sent a memo protest to the President of the Government, to the Minister of Industry, to the parliamentarians of the region and to the PPC:

> *While 400 families of my village and I personally believed that the electrification of my community, anyway, would take place in the year 1966 and yet after the extension of power lines to Nea Kallikrateia, Chalkidiki, distant about 800 meters from our village, quite oddly, we have been informed by radio and newspapers the unpleasant, for us, fact that once again the electrification of our community is not included in the announced program for the year 1966.*
>
> *Our indignation, caused by this announcement, has been raised to such a degree, that we ask ourselves if we are not Greek. Don't we have the right to become partakers of the scientific and cultural discoveries? Moreover, beyond that, why the communities Lakkoma, N. Gonia, Eleochori, Ag. Pavlos, in Chalkidiki, have joined the program in the year 1966 and not our own community, in the prefecture of Thessaloniki, which is just a few kilometres away from them? Moreover, if we still*

[244] Mesimeri Community, "Recalling the Mesimeri Community electrification" (29 Feb. 1960). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 69.

think the sequential positioning of these villages, on the electrified line from Thessaloniki, the first one that should be electrified is our own community. What is going on?[245]

In 1966, the Mesimeri Community also was still sending memos. The village tried over 15 years to acquire electric power, but even in 1966, it was not included in the technical program of electrification, although it was only 200 meters next to the utility line. “In each action we have taken, we always get promises”, remarked the President, but later they alleged technical reasons for the non-participation of the community in the program. The President invoked the importance of the rural area, with its many artesian wells, and the benefits that could have come by electric power to the increase of the production and living standards.[246]

The municipalities, even after electrification, were often unable to pay off the amounts for network expansion. In 1975, the temporary economic weakness of Sohos Municipality had left uncollectible accounts of 27,000 drachmas concerning the third instalment of financial participation for network expansion. Finally, the Division of Macedonia-Thrace Region decided to settle the debt by giving one-month deadline.

[245] Kato Scholari Community, “Memorandum of the Kato Scholari Community, Thessaloniki Prefecture (18.3.1966)”. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[246] President of the Mesimeri Community, “Recalling the Mesimeri Community electrification” (21 Apr. 1966). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 69.

2. *Village Overview Surveys*

The biggest part of the most reliable evidence available at the time of electrification of the Greek countryside is found in the Village Overview Surveys. For example, on March 7, 1956, the PPC employee N. Damianos composed a Survey for the lowland Community Heraklion in Langadas County.

That year, the village had 1,000 inhabitants, 220 families, 190 mostly adobe houses, 8 stores, 1 flourmill and 23 motor wells. The Community had drawn 140,000 drachmas budget for the year 1955-56. The PPC was estimating that the village would consume 33,162 KWh per year, for which they would pay 57,246 drachmas. The total cost for network expansion to Heraklion, Langadas, would reach the 484,250 drachmas; the works included a 1.77 km 15 KV line, 1 transformer 50 KVA, 1.000 km of low voltage network, 175 single-phase and 23 three-phase supplies.

Another interesting item recorded in the Survey was the profitability index, which in the case of Heraklion, Langadas, was 1 to 8.47, which meant that the Company would spend on network expansion 8.47 times more than the annual revenue from this village. For this reason, the company estimated that the Community should pay a financial contribution of 140,000 drachmas.[247]

In a note dated 13.8.58, the PPC mentions some rural villages, among which Heraklion Langadas. As outlined in the memo, the PPC had sent a letter on 30.9.57 to the Community of Heraklion

[247] Public Power Corporation, Village Overview Survey (Heraklion, Langadas, 7 March 1956). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

announcing the final amount of participation, inviting them to come to sign the related contract and to fulfil its obligations, “as otherwise the allocation for their electrification may be placed elsewhere”.[248]

The Community had come to sign the contract, but they failed to respond to the obligations. Thus, the line eventually went elsewhere. Then, in April 1960, the Community Council of the village acknowledged that their economic weakness had not yet permitted the cultural and economical elevation of the residents of the village, and agreed to promote electrification by providing personal work by the inhabitants:

> *1) The residents of the Community will participate through the provision of personal work to the drilling of the pits for placement of the poles and their buttresses.*
> *2) For the remaining amount to complete the expenses we consent to participate according to the conditions defined by the honourable Ministry of the Interior, the PPC and the Community.*[249]

[248] Public Power Corporation, “Note” (13.8.58). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[249] Heraklion Community, “On the acceptance of the terms for the expansion of the community electrification network by the PPC” (7.4.1960).

2.1. *In the plains and in the prefecture of Thessaloniki*

From the internal PPC correspondence, we learn about unknown aspects of the period before the establishment of the company. The settlement Gallikos in Nea Magnesia, Thessaloniki, was electrified in the past, "only partially, by the electric power contractor of Nea Magnesia and Diavata, Mr. Giamouroglou".[250] Later, the plan for the electrification of Nea Magnesia was given to OLCO, which for unknown reasons failed to bring electric power to Gallikos settlement.

Giamouroglou had interrupted the electrification for a long time before the PPC undertake the connection to Nea Magnesia and Diavata. To electrify Gallikos, the PPC integrated it to the combined project for electric supply to the irrigations of the wider area. Nevertheless, by 1956, the network had not been built; then, the PPC made a new pre-investigation, especially since the municipality of Nea Magnesia agreed to pay 20,000 drachmas for the participation of the settlement Gallikos. However, in the case of Gallikos the settlement remained in the dark, until the electric power installation completed by the PPC.

On March 12, 1957, the parliamentarians K. Tsigaras, B. Efremidis and G. Evangelou addressed a question to the Minister of Trade and Industry on the issue of settlement Gallikos' electrification. Eleven months had passed during which the settlement had been deprived of electric light, as the company

[250] Public Power Corporation, Regional Division of Macedonia-Thrace, "Electrification of the settlement Gallikos, in the Community Nea Magnesia, Thessaloniki" (9 April 1957). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

Giamouroglou delivered the region to the PPC. Apparently, the transitional period was an opportunity for business disputes:

> *This retardation raises fierce indignation to the residents of the aforementioned settlement, which is becoming fiercest indignation because of the fact that the PPC rushed with unprecedented speed to install a transformer and administer an electrical connection to one remote and just one year ago set up petrol station, situated on the public highway Thessaloniki-Athens, just five hundred meters from the above settlement; while in this settlement – situated on the same public highway - also exist three more, much earlier established, petrol stations, which were previously electrified, but already devoid of electrical light, as the settlement.*
>
> *The indignation of those residents is also exacerbated because the electric line passes tangently near the settlement and thus the required costs for installation of the network cannot be large...*[251]

The establishment of the PPC in 1950 triggered the transition from private initiative to central planning. A number of cities and towns were included in the grid and the old private power plants were abandoned. In 1955, the Community Sohos, in the province

[251] K. Tsigaras, B. Efremidis, G. Evangelou, *Question to the Minister of Trade and Industry* (12 March 1957). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

Langadas, Thessaloniki, pointed to the inability of the local contractor to improve the supplied electric lighting current.

> *Your Excellency Minister*
> *Our town, numbering more than thousand families (about 5000 people), since 1928 is electrified very poorly, by a factory, whose machines and network have totally worn out; while recently, this light was equated to complete darkness of our entire municipality, so everyone and especially the professionals remain for a long time in full resent...* (M. Vasilikos, Mayor of Sohos, December 30, 1955).[252]

In 1955, the PPC had undertaken the electric lighting to Langadas. The Municipality of Sohos asked the extension of the program to the east of Langadas to include Sohos. Among the arguments invoked was that the entire region had suffered from the guerrilla and was subject to the Law 2536/53 “on repopulation of the border areas of the country”.

With a brief memo to the General Director of PPC sent, undated, around 1957, the parliamentarian George Themelis asked him to be interested and to promote the lighting of Sohos:

> *Chrysavgi Community also [neighbouring Sohos] ... accepted to participate by the sum of 178,000*

[252] Municipality of Sohos, Letter to the Minister of Industry. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 68.

drachmas and I request warmly to be scheduled through 1958.[253]

G. N. Pezopoulos, General Director of PPC, in early 1958 responded to Themelis that the electrification of Sohos Municipality "may become feasible immediately after the redemption of the local electric company".[254]

Different was the case of Chrysavgi Community, which had failed to accept promptly the conditions laid down by the PPC for electrification. Nevertheless, once the Prefecture of Thessaloniki approved on 25.12.57 the expenditure for expansion (178,000 dr.), the company was reviewing the issue of Chrysavgi electrification.

Interventions by parliamentarians for solving electrification problems and delays were a standard practice throughout this period. On 12 November 1958, following requests by the community, promoted by the parliamentarian Mr. Tzitzikostas, the Distribution's Utilization Director, K. A. Apergis informed the Electric Division of the Ministry of Industry that the electrification of the communities Adendro, Kymina, Nea Malgara, Vrachia, Partheni and Nea Chalcedon of Thessaloniki falls into the framework of the under implementation general electrification program. Regarding the supply of electricity for irrigation, the farmers interested should submit applications to PPC offices in Thessaloniki.

[253] Themelis George, Thessaloniki Parliamentarian, *To the General Director of PPC.* Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[254] PPC, "Electrification of Sohos Municipality and Chrysavgi Community, Thessaloniki" (13 January 1958). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

An obstacle for the electrification of the villages Kymina and Nea Malgara was the flooded riverbed of Axios. On 13 June 1958, the Division of Distribution Projects and Constructions considered as most appropriate the extension of the 15 KV Chalastra line and its passage through the riverbed. The construction should be completed by summer. After construction, the line would require frequent inspection, although a disaster was unlikely, since through the same bed already passed the telephone line (a lighter construction). In addition:

> *... if during operation the line presents serious drawbacks or do not provide sufficient security guarantees, in the future may also be addressed the case to remove it, as long as it may be more efficient the electrification of these communities from the scheduled to future manufacture 15 KV line to Nea Chalcedon.*

A few years later, at the beginning of 1965, Nea Malgara and Kymina were not yet electrified and their story reached the newspaper *Macedonia*. The Regional Director K. Bouzakis sent a brief note to the newspaper, informing that the “internal distribution network has almost finished", with the PPC teams to work intensively; Bouzakis was promising that the two villages would soon be electrified.[255] In most cases, for reasons of geomorphology, the villages had to assert their right to electric power over the entire region. In October 1964, the Gerakarou Community wrote to the

[255] PPC, Note to the newspaper *Macedonia* (18 January 1965). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

Minister of Industry asking for electrification of the surrounding area villages Gerakarou, Kavallari, Saint Basil, Langadikia, etc.:

> *We recently read in the press, that the Stavros Community was included in the electrification program in the year 1965. This event is for all the other communities a glaring injustice, although we are sincerely pleased. We would like to interpret it as a harbinger for the electrification of the other communities... that equally strongly suffer from the lack of electricity...*
>
> *The colleague communities, to which this letter is being notified, driven by the necessity to satisfy our collective request, are asked to act what would they consider as wishful.*[256]

3. *Electrification of border zone villages*

In the Central Archives of the PPC, one can find archival material for the complement of the electrification of villages, which were characterized as *border zone* villages. In 1964, the PPC considered as border zone villages those located 7 km from the northern borderline of the country. At the beginning of 1964, 85 border zone villages were connected to the network; 29 among them were located in the prefecture of Ioannina, 17 in Corfu prefecture, 11 in the prefecture of Florina, 8 in the prefecture of Drama, 7 in Serres, 6

[256] Gerakarou Community, "On the communities electrification", Letter to the Minister of Industry. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

in Thesprotia, 5 in Pella and 2 in Evros. In another 70 border zone villages the network was under construction: 14 in Evros, 10 in Ioannina, etc.

“What left" were 111 more villages, for which it was planned to be “serviced by the National Network or by already existing islets of production”. As noted by the authors of the list:

> *Furthermore, there are approximately 15 other villages, 10 of them in Rodopi prefecture, with a population over 250 inhabitants (to 600) which are either inaccessible or very distant from existing networks and therefore require for their service the establishment of local autonomous power plants. These villages however and their respective expenses are not included in the above table.*[257]

After running the 1964-65 electrification program, 531 border zone villages were remaining unelectrified, of which 271 had a population higher than 200 inhabitants, 124 with 101-200 inhabitants and 136 had 0-100 inhabitants. In the program nominated for 1966 were included 205 villages.

Furthermore, 111 villages were included in a complementary electrification program: Thus, 17 villages in the prefecture of Evros joined the program, many of which were quite large populations (e.g. Ambelakia with 1,025 residents, Cyani with 1,141, etc.), as well as 11 villages in the prefecture of Rodopi, 5 in Xanthi prefecture, 9 in

[257] “Table of border zone villages”. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

Serres, 1 in Drama, 16 in Kilkis, 17 in Pella, 17 in the prefecture of Ioannina, 4 villages in the prefecture of Florina, 7 in Thesprotia, 1 in the prefecture of Kastoria, and 6 in the prefecture of Corfu.[258] Other 215 villages were characterized by the authors of the list as "residual":

> *1) Villages inaccessible due to the lack of proper roads. 2) Remote villages or located at a disproportionate distance to the networks. 3) Most of the villages and little settlements which are not marked on the map but they are only mentioned in the Census.*[259]

In 1966, the PPC considers as border zone villages those distant 0-7 km from the border and 0-5 km of coasts opposite to foreign territories. Additionally, a second border zone includes the villages within 7-15 km from the border. In 1966, 205 border zone villages were included in the electrification program (53 in Evros, 18 in Rodopi, 13 in Xanthi, 10 in Kilkis prefecture, 20 in the prefecture of Florina, 17 in the prefecture of Corfu, 15 in Dodecanese, 11 in Samos prefecture , 10 in the prefecture of Lesvos, etc.).

The next years, as border zone villages were considered those within 15-20 km from the border. Based on this definition, the program was expanded and 5 more villages in the prefecture of Evros (Doriko, Aetochori, Avas, Nipsa, Amphitrite) joined the group of border zone villages to be electrified; moreover, 10 villages in the

[258] "Complementary Electrification Program of Border Zone Villages (expenditure 60.000.000 dr.)", pp. 1-4. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[259] "Electrification of Border Zone Villages". Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

prefecture of Rodopi (Koptero, Mosaico, Kikidio, Lampro , Dokos, Fillyra, Mikra Xydia, Deilina, Nevra, Skaloma), 6 villages in the prefecture of Xanthi (Komnina, Mega Evmiro, Orestini, Pilima, Centauros, Satres), 10 villages in the prefecture of Drama (Panorama, Paranesti, Mesochori, Xagnanto, Karpoforo, Kapnofyto, Aeidonokastro, Temenos, Tholos, Kato Tholos), 5 villages in the prefecture of Serres (Lithotopos, Psomotopi, Oreini, Ano Oreini, Xirotopos), 10 villages in the prefecture of Kilkis (Pentalofo, Kotyli, Chorygi, Vathi, Kato Theodoraki, Ano Theodoraki, Efkarpia, Gerakari, Divouni, Tripotamos), etc.[260]

In that stage, 126 villages were included in the overall project, and the expense reached the 67 million drachmas. The prefectures of Thesprotia, Ioannina and Kastoria included the majority of the border villages selected for electrification.

In May 1971, the General Division of Distribution sent to other PPC Divisions a memo that included names of non-electrified border zone villages in every Regional Division. According to this list, on 30.4.71, not electrified were four border zone settlements in the prefecture of Evros, 39 in Rodopi, 34 in Xanthi, 6 in the prefecture of Drama, 2 in Kilkis, 3 in Pella, 1 in the prefecture of Kastoria and 6 in Florina (Ag. Achilleios, etc.). In addition, 11 border zone settlements in the prefecture of Ioannina remained without electricity, 13 in Thesprotia, 28 in the prefecture of Corfu, 4 in Samos, 14 in the Dodecanese (Pserimos, Arki, Panormitis Simi, etc.), 4 in Chios, 6 in the prefecture of Lesvos.

[260] "Complement of the Electrification of Mainland Greece Villages situated in distance 15-20 km from the border", pp. 1-5. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

4. *“Rural electrification program”*

In the 1952-53 Annual Report, the company's management estimated that the demand growth will depend mainly on the extent of primary (15,000 volts) and secondary (380-220 volts) distribution networks, on the number of credits of Distribution Organizations, on the results of the electric appliances manufacturing industries, and on the transfer to the new system of old and connected new customers of the Distribution Organizations. Finally, the demand would be obviously affected by the general economic situation of the country. In particular:

> *The electricity demand in rural areas will depend on the special care for the organization, which will be paid to raise enough consumption in some of these regions, located near the distribution networks. In this manner, the investment expenses for the agricultural service will remain within the limits of the economic potential of electrification, at least during the first stage of its development, and the cost per kilowatt-hour will remain at favourably levels for the rural electrification.*[261]

A decade later, in an interview on 21.03.1966 the General Director of PPC Prof. N. Dimopoulos refers to “an exhaustive effort of the PPC throughout the countryside to perform the - unprecedented in the annals of, not only the country, but also many other advanced countries - Rural Electrification Program 1964-65.

[261] PPC, *Annual Report in the Fiscal Year 1952-1953.* Athens, 1953, pp. 75-76.

This program ultimately included in total 960 villages and settlements, and despite major doubts and serious concerns of many, it was terminated early due to the heart-warming efforts of the staff of PPC".[262] It absorbed a total of 500 million drachmas, while, in the year 1965, the PPC allocated 330 million drachmas for distribution projects, "including the power supply of about 3,000 wells to irrigate 10,000 hectares, which costed 40,000,000 drachmas".[263]

Prof. Dimopoulos, was also announcing a new rural electrification program for the years 1966-68, which set as a target to connect 3,100 new villages and settlements, with an expenditure of 1.7 billion drachmas.

In May 1968, the Distribution's Utilization Division sent to the Seminar for Urban Works at the National Technical University a list of the earthquake-hit settlements of Epirus and Thessaly, which were, or would be, electrified in 1968. Among all the settlements on which the NTUA requested information, only Metsovo, Anileo and Milea in Ioannina, Drosopigi in Arta, Pertouli, Elati and Kotroni in Trikala were electrified; in addition, the PPC was projecting to electrify, in 1968, Agnanta, Palaiochori-Drosopigi, Cataractis, Koukoulia, Chosepsi (or Cypseli), Lepiana, Mikrospilia-Lepiana, Palaiokatouna, Potamia-Palaiokatouna, Ramia and Athamanio in Arta prefecture, and Cherokopi-Petrovouni in Ioannina.[264]

---

[262] Tsotsoros N. Stathis. *Energy and Development in the post-War period. The Public Power Corporation. 1950-1992: Development and Crisis.* Appendixes, pp. 43-44.
[263] Ibid.
[264] Distribution's Utilization Division, "Electrification of settlements", Letter to the Seminar of Urban Works at NTUA. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

To complete the program of rural electrification, sometimes it needed repeated requests and suggestions, until the electric current come up to the village or any houses or settlements. For example, in July 1973, the Regional Governor of the Central and Western Macedonia asked the Regional Division of Macedonia-Thrace to integrate in the electrification programs the following settlements: Mikri Santa – Kastania – Imathia, Aloro – Kleidi – Imathia, Kato Vrasna – Asprovalta - Thessaloniki, Nea Vrasna - Asprovalta – Thessaloniki, Mavrorrachi - Assiros – Thessaloniki, Plagiochori – Anavryto - Kilkis, Pella – Kallipoli - Pella, Ano Grammatiko - Pella, Agios Achilleios – Florina, Paralia Dionysiou - Chalkidiki, Palaiokastro and Kalamitsi - Sykia - Chalkidiki. The inclusion of settlements in rural electrification programs was considered as necessary for the following reasons:

> *1) retention of the population, 2) actual transfer and construction of new settlements, 3) touristic utilization, 4) creating livestock units, 5) utilization and promotion of existing antiquities etc.*[265]

The expansion of urbanization in many villages of the countryside caused increasing electrification needs. Every month that passed, there were new electrifications of provincial settlements. For example, in September 1971 the Department of Statistic Distribution of the Distribution's Utilization Division sent to the Ministry of National Economy a list "showing nominally the number of electrified

[265] "Programming of settlements electrification", pp. 1-2. Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

settlements during the month August" of the same year.[266] The list recorded 11 electrified settlements in Aetolia-Akarnania, 1 in Arcadia, 6 in Arta, 1 in Achaia, 4 in the prefecture of Grevena, 2 in the prefecture of Drama, 1 in Evros, 2 in Elis, 1 in Thesprotia, 3 in the prefecture of Ioannina, 2 in the prefecture of Kefalonia, 1 in Kozani, 3 in Laconia, 3 in Messenia, 3 in Trikala and 2 in Chalkidiki.

4.1. *Underemployment and mechanization*

In 1929, the tractors available throughout the country were 700; while in 1939 they were no more than 1,578. The use of fertilizers was also limited before the war and their prices very expensive.[267] The Program for Economic Recovery in the years 1949-1950 provided for the promotion of *mechanized farming,* to supply the farms with tractors, harvesters and other machines, plows and other farm equipment, and also to carry out land reclamation, deep soil tillage activities etc. For drilling and irrigation, the officials planned to supply rotary and percussive drilling machines, pumping and irrigation equipment, and the execution of drillings.[268] Yet, the competent authorities assured that drilling machines already worked for exploratory drilling, beyond what other new would be delivered soon.

> *Firstly, the tractors imported under the Reconstruction Plan by AMAG, UNRRA and ML,*

[266] "Progress of the Rural Electrification Program". Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[267] Filias V.I. *Problems of Social Transformation.* Athens: Papazisis, 1974, p. 186.
[268] Supreme Reconstruction Council. *Revised Program for the Economic Recovery of Greece 1949-1950,* p. 90.

were delivered in cooperatives, agricultural cooperative associations or individuals. The Mechanized Farming Service kept only heavy tractor for the execution of land reclamation, deep soil tillage activities or land reclamation projects. The tractors of mechanized farming are used for usual ploughing - by the Mechanized Farming Service crews - in the villages who suffered by the guerrilla.[269]

For the purchase of small irrigating machines, the farmers were receiving a medium-term loan from the Agricultural Bank, to pay to the value of the machine, which they waited to receive from the Ministry of Agriculture. The revised Reconstruction Programme of Financial Year 1950-51 earmarked an amount equivalent to 4.5 billion dollars for the purchase of seeds, agricultural machinery, sprocket tractors, trucks, plows, threshing machinery, agricultural equipment, spare parts, scientific laboratory instruments, various agricultural machines, etc.

The narrowness of manpower is, already, sufficiently noticeable in certain areas, to quicken the mechanization of certain activities (e.g. small tractors were initiated to the ploughing of vineyards in regions where labour is scarce and expensive during peak periods of activity, as for instance at Corinth).[270]

[269] Ministry of Coordination. *A΄ Regional Recovery Council,* Central Macedonia, Thessaloniki, 12-15 November 1949, Findings, p. 9.
[270] Ad. Pepelasis & P. K. Panayiotopoulos. *The overflowed labour in Greek agriculture, 1953-1960,* Athens: Centre of Economic Research, 1962, p. 49.

It is true that the strongest evidence for the transformation of rural life began to emerge in the economic sphere, when the consequences of the so-called *hidden unemployment* became obvious:

> *The term "persistently overflowed labour force" has often been used as a synonym of disguised unemployment. The concept of disguised unemployment refers to the volume of labour force, which can be moved over a given period of time without reducing output. The concept of disguised unemployment implies a marginal productivity equal to zero plus the condition of ceteris paribus (other conditions unchanged).*[271]

During 1953-54, the movable surplus amounted to 3.5% and 2.3% of the workforce, equivalent to approximately 90,000 and 60,000 people of working age. Indeed, in the decade 1950-60 an extraordinary egress of the rural population took place. Between 1953 and 1960, 380,000 people (54,000 per year) left the provinces and settled in Athens.

Migration, increase of cultivated land, increasing involvement of intensive cultivation (cotton, fruits, vegetables) and increased yields, resulted in a stronger demand for labour force in agriculture. Gradually, while in 1953 the percentage of the persistent labor surplus in agriculture was 6.1%, in 1954 dropped to 5%, and the next years there was a reversion, with a lack of workforce. In 1955,

[271] Ad. Pepelasis & P. K. Panayiotopoulos. *The overflowed labour in Greek agriculture,* Ibid., p. 34.

the percentage of persistent labour surplus became negative, -0.1%, which means lack of manpower; in 1956 it was -0.9%, in 1957 it reached -4.8%, in 1958 fell to -1.6%, and in 1959 it was -2.6%, to become, in 1960, a positive rate again: 0.2%. The economists of KEPE were pinning their hopes on the mechanization of farm work, and they estimated in 1962 that tractors, from 20,000 at the time, could increase by 50%.

Another important study was conducted in the early 1950's on the island of Crete. This study of Cretan economy, by the Rockefeller Foundation, remarked an outsized rural underemployment, possibly 60% to 65%.[272]

By considering, however, geographic segmentation and dispersion of rural allotments, production for self-consumption, "necessary work" for market exchanges, the percentage of rural underemployment reduced to 20%. Other, Greek and foreign, research approaches gave higher or lower underemployment levels:

> *For Greece, the estimated "rate of employment of labour" is raised to 54%, and the corresponding underemployment to 46%. Therefore, based on 33,000 square kilometres of farmland and 1,180,000 males employed in agriculture... (i.e. 36 males per square kilometre of land under cultivation) we entail a*

[272] Leland G. Albauch. *Crete, A Case Study of an Underdeveloped Area.* New Jersey: Princeton University Press, 1953, pp. 245-46. Available at: http://www.questia.com/PM.qst?a=o&d=476749

"full employment limit" for Greece by 19 males per square kilometre" [for the year 1946].[273]

At the same time, Prof. Ch. Evelpidis estimated the underemployment of the rural population to 40%.[274] During the period 1961-71, the active agricultural workforce was decreased by 630,000 persons, due to the strong outflow of rural population to the cities and abroad.

Yet, in 1977, only 870,000 farmers made at least 140 working days a year, i.e. characterized as the economically active agricultural population in the country, in a total of 2,961,000 active population. In addition, 180,000 farmers were underemployed, making less than 140 working days. Including the latter also, the workforce was raised at 3,140,000 people.

5. *The period of the dictatorship (1967-74)*

The dictatorship violently cut off villages from the support of their representatives in the Greek Parliament, while the residents were forced to send their requests along other ways, sometimes alone and helpless. After the electrification of a village, very often, they needed to expand to new subscribers or settlements. For example, in 1971, an interested consumer was obliged, after delivering the technical-economic inquiry, to pay a 10,423 drachmas participation

[273] Ad. Pepelasis & P. K. Panayiotopoulos. *The overflowed labour in Greek agriculture, 1953-1960,* Athens: Centre of Economic Research, 1962, p. 67.
[274] Chrysos Evelpidis. "Review of the Greek Agricultural Economy". In: *Agricultural Economy,* January-March 1957.

for the cost of electricity. The subscribers could pay to participate "either at once or by 18 bi-monthly instalments."[275] The close proximity of the power poles was a common argument used by those wishing to take electric power soon or pay cheaper the cost of electrification. On February 7, 1970, seven families from Zagliveri, Thessaloniki, sent a letter to the "Vice President of the Government" to request the electrification of their homes, in a distance "only sixty (60) metres from the power posts":

> *... We also want to have a light that is so essential in every home. Every one of us applied to the PPC and asked to connect us. To acquire light in our homes, that we laboriously built, with the loans given to us by your Government; we do not know how to thank you.*[276]
>
> *In order to get light into our homes under the program of PPC, four poles are needed to be passed. For this connection, they ask 16,500 drachmas. We believe, that you will understand, that we are unable to pay so much money, because we, all of us, are young heads of families and we are created from nothing. It is very sad to see the neighbouring houses to radiant, while we live almost in the dark. The great thing is that we live in a town,*

[275] PPC, "Electrification of 3 houses in the Community of Kato Scholari, Thessaloniki" (1 Feb. 1971). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[276] Letter written by 7 families in Zagliveri, Thessaloniki, to the "Vice President of the Government" (7.2.1970). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

which brings us in more disadvantage, if everyone else disposes light and we do not have.[277]

As another resident of Zagliveri writes in a note, after one year (26.9.71), electricity is now considered essential by every inhabitant of the village. The citizen justifies his claim referring to his needs:

I wish to sit down in the evening, when I return from my farm work, to read a little in rest, to eat like a human and to enjoy a little the culture with the electric light.

In 1971, celebrating the 150 years anniversary of Greek national freedom, Nicholaos Synanas, from Diavata, Thessaloniki, was protesting because he illuminated his house with an oil lamp, although lived near Thessaloniki.

At my request, Mr. President, the PPC replied that I must deposit about 48,000 to have connection. Mr. President, I am unable to pay this huge amount and will inevitably live in the darkness with my family.[278]

The denervation of democratic institutions from 1967 to 1974, isolated rural inhabitants from the mechanisms of central government. The possibility to proxy was negated in its elementary form, after the abolition of free elections. Without MPs to support people's interests, the villagers were often forced to send personalized, agonizing and emotionally erratic calls to agents of the

[277] Letter written by 7 families in Zagliveri, Ibid.
[278] Nicholaos Synanas, Letter for electrification (22.4.71). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

junta regime. During the dictatorship, a common destination of inhabitants' requests was the ministries, from where the requests were forwarded to PPC for an answer.

An example of such a response to an individual demand for electrification, is dated to October 23, 1971, when the PPC answered to Vasileios Peristeras, resident of Zagliveri, Thessaloniki, that he couldn't avoid the payment of the participation costs of the economic-technical survey. According to the company's reply, the participation could be paid in 24 equal bi-monthly instalments.[279]

The repeated calls by local communities for their electrification, were triggering the networked agents, often causing the intervention of bodies of power. Local applications revealed, however, the root causes of the procrastination of expansion. For example, in 1970, the settlement Gerovrysi, at Ramia Community, Arta, had no electricity because of the lack of transformers. On 13 May 1970, the Deputy Governor of PPC responded to Stylianos Pattakos, regarding Gerovrysi, Arta:

> *The settlement under consideration joined in the rural electrification program of the year 1969, whereas, since September of the same year, the construction of the required distribution networks had been terminated; however, it was not feasible to put them under voltage, because of the well known urgent lack of transformers, our enterprise faces*

[279] Distribution's Utilization Division, "Electrification of Mr. Vasileios Peristeras' house in the settlement Zagliveri, etc." (23 Oct. 1971). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.

throughout the course of the past year, for which anyway the enterprise was not responsible.[280]

Across the country, the lack of transformers had as a direct consequence the delay of the electrification in a large number of villages, although "their networks had been completed... by the end of 1968".[281] When the PPC received transformers from abroad, they were electrifying the settlements, which by the time of completion of their networks, had a relative priority.

5.1. *Statistics of rural electrification*

The PPC promoted rural electrification through modern and innovative management strategies. One of the components of these strategies was *forecast*. The Commercial Service in Nafplion kept "Book of Forecasting Indices" according to which, in 1966, electrification projects in aviaries were promoted and executed in Fychtia, Monastiraki, Korakovouni, Doliana, Astros, Koutroufa, Mesogeion Astros, Timenion and elsewhere.[282]

The cost of a private electrification ranged from 3,498 to 27,044 drachmas (for those with available data). Livestock customers participated from 498 to 20,776 dr.

[280] PPC, Deputy Governor G. Pantazopoulos to Styl. Pattakos, "Electrification of the settlement Gerovrysi, Ramia Community, Arta" (13.5.1970). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.
[281] Ibid.
[282] PPC, Nafplion Territorial Division, Commercial Service, "Book of Forecasting Indices".

For public and municipal pumping stations in Methana and Poros, the costs were higher: the cost for the pumping station in Methana was 78,912 dr. The following years, the subject of rural electrification expanded:

> *Until 1970, rural electrification had been primarily devoted to irrigation consumers, drainage and mixed use (hydro-irrigation), which were electrified by implementing, throughout the country, certain constants (agro-technical constants) of annual consumption per hectare versus the type of crop and manometric height.*[283]

During the 1970's, other uses of rural electrification developed: “From the year 1970 onwards by No. YEB 15085/5572/18.4.70 joint decision of the Ministers of Agriculture and Industry have been subjected to the process of rural electrification, apart from the above, the consumers of aviaries, brooders, piggeries, cowsheds, greenhouses and fish ponds. Subsequently, through a new resolution, the object of the rural electrification widened even further by the inclusion of other rural economy activities, namely rabbit farms, model farms for fattening lambs, apiaries, stud farms for breeding racehorses, as well as of other agricultural enterprises organized by cooperative organizations or land reclamation organizations (i.e. drying facilities, refrigerators, slaughterhouses, ... etc.)”.[284]

[283] Dim. Colomvas & T. Fotopoulos-Christodoulakis, *Study relating consumption and surface or installed power in rural electrification customers (Other agricultural uses)*, p. 2.
[284] Dim. Colomvas & T. Fotopoulos-Christodoulakis, Ibid., p. 2.

In Peloponnese and Epirus, since 1967, 451 aviaries, 21 cowsheds, 1 sheepfold and 1 greenhouse had been electrified. In 1968, the electrified aviaries were 542, the cowsheds 27; furthermore, four piggeries and one fishpond. In the same Regional Division, in 1973, were promoted to construction the distribution networks for 101 aviaries, 98 piggeries, 126 cowsheds, 25 sheepfolds, 19 rabbit farms, 3 fish ponds, and 5 greenhouses. Eighty of these projects related to the area of Ioannina, and 57 to the area of Agrinio.[285] In 1974, were found, in Peloponnese and Epirus, 1,167 electrified aviaries, 356 piggeries, 392 cowsheds, 80 sheepfolds, 58 rabbit farms, 17 greenhouses and 17 fishponds.[286]

The water drainage works, however, were the main body of rural electrification. The Regional Division of Peloponnese-Epirus, in 1973, promoted to construction 1,511 water drainage projects in 13,203 hectares of farmland. Some of these works were additional to the rural electrification program, as the collective pumping stations in Penios, Acheloos, and Ioannina plains.[287] The largest area of newly irrigated land was located in the areas of Nafplion, Kalamata, Pyrgos, Agrinio etc. In Nafplion, 1,059 irrigation projects constructed between 1970 and 1973, in Kalamata 686, in Agrinio 255 and in Pyrgos 562. To support these operations, throughout the four years 1970-73, the Regional Division of Peloponnese-Epirus had built a 1,143.4 km MV and HV network.[288]

---

[285] PPC, Regional Division of Peloponnese and Epirus, *Topic: Statistics of Rural Electrification, Subject: Statistic data of electrification in the year 1973 and in the 4year period 1970-73* (5.2.74), tables 3-4.
[286] PPC, Regional Division of Peloponnese and Epirus, Ibid., table 1.
[287] PPC, Regional Division of Peloponnese and Epirus, Ibid. tables 1-2.
[288] Ibid., tables 19-20.

The Ministry of National Economy decided in 1973 rebates for consumers' "irrigation, greenhouses, nursery gardens, aviaries, brooders, cowsheds, piggeries, model sheep-milking pens, model farms for fattening lambs, rabbit farms, fishponds, apiaries and stud farms for breeding racehorses".[289]

The new basic rate was adjusted to 0.55 dr./KWh. The new consumers of these agricultural uses should pay in advance, against consumption, an amount of 50 dr./KW of installed capacity. The charges for supply of new consumers, "acceding to the local programs for construction - subsidy of rural electrification projects", shared as follows: the PPC undertook 40% of the extension and supply costs, while the consumers and public investments cumbered with the rest.

All these measures would be applicable to all related charges, such as drying facilities, refrigerators, fodder manufactures, slaughterhouses, etc. For irrigation-drainage, greenhouses, aviaries and nursery gardens, there was also the possibility of a dual log tariff, with 0.65 dr./KWh for peak hours and 0.40 dr./KWh for hours 14:30-17:00 and 23:00-7:00.

"The construction of new electrification networks, especially of rural use owners" except of drainages, was integrated to the local rural electrification programs "as long as the corresponding sheets of financial stability" showed a utilization rate greater than one.[290] Exceptionally, could be included in the local programs the following

[289] Ministry of National Economy, General Division for Rural Development and Research, *Topic: Readjustment – Complement of rural electrification measures,* p. 2.
[290] Ministry of National Economy, General Division for Rural Development and Research, Ibid.

categories of projects with lower utilization rate of the unit: Hydro-irrigating projects. Projects in border zone areas. Projects that would create favourable conditions for future economical electrification of neighbouring facilities.

6. *Political Changeover*

At the time of return of the democracy, the electrification process of the Greek countryside tended to complete. Most residents' calls for electrification referred to settlements with a very small population or network expansion in houses remote from main settlement.

Constantine Konofagos was Minister of Industry and Energy in the early years of the new democratic regime. The eight families of the settlement Kedros in Petra Community, Arta, were addressing a letter, in 1977, to protest to Konofagos for the "lack of electric light". The houses were along Kedros road, which starts from Ano Petra:

> *In 1967, our Community was supplied with electricity. A part of the above road was also electrified and the rest is neglected for unknown reasons, while the program included the electrification of the entire road. Not being able to resist to the competent authorities, we have accepted the condition, with the hope we might receive electricity. Since then, ten (10) years have passed*

away and the same situation persists, which may be described as tragic...[291]

Eight families were still living "in the era of the oil lamp", according to the authors of the letter. The data invoked was the proximity (300 meters) from the last electrified house and, most importantly, "that the settlement has a phone which came in 1971".[292]

In the mid 1970's, despite shortcomings, the electrification networks covered almost the entire countryside. For example, in the prefecture of Arta, among 239 settlements, 170 of them were electrified or included in old programs by the PPC. Another 62 villages in Arta had joined a new program, while only seven were remaining out.[293] The foregoing inventory had caused a question by the MP Dimitrios Rizos to the Minister of Industry, concerning the electrification of about 10 buildings in the village Ramia, Arta.

The Division of Distribution's Utilization replied that the current program included and electrified with PPC's expenses "only settlements which are reported separately in the current Census and meet the other criteria of integration in those programs".[294] The request of the inhabitants of Ramia was rejected because its satisfaction required "a significant extension of networks and other

[291] Application of the Inhabitants of the Settlement Kedros, Petra Community, Arta. To the honorable Minister of Industry and Energy Mr. Konofagos Constantine (2.8.77). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC.
[292] Ibid.
[293] PPC, "Progress of electrification in Arta prefecture" (3.3.76). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.
[294] Ibid.

distribution works, with a total cost of 600,000 drachmas".[295] The company observed that, although in Ramia 85 consumers were already served, a further significant expansion of the network could not be addressed, because in the whole country there were many similar cases.

During this new era, new forms of vindication developed, disputing the mainstream frameworks of representation. Local initiatives and direct democratic forms of intervention appeared, requesting electricity for rural communities.

Meanwhile, these popular forms of representation made clear that the completion of the electrification, with all the widespread expansion of the urban web, always requires some connection work to be done:

> *Many times, we have done relative actions to install electricity in the site Kryopigi, Cataractis Community, Arta. The site lists about 150 people with a stark number of permanent residents, who are engaged in agriculture and livestock. Last summer, poles were placed, but to the half of the settlement, with the excuse that there is no passable road, and work stopped. We live under primitive social conditions, with no electricity, telephone, transport. It is unacceptable in the modern era to miss such basic goods for living. We are looking forward for*

[295] PPC, Distribution's Utilization Division, "Electrifications of new low voltage consumers" (1.3.76). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.

immediate installation because otherwise we will be obliged to leave the site, taking the road of urban centres. Related publications we made in the newspaper "Eleftherotypia" on 7.12.81.[296]

The PPC responded to the request of the residents that the village had joined the running Rural Electrification program and the construction had already started.

During this period, continued efforts in the area of rural electrification included studies of the correlation between: a) surface of electrified farm facilities, b) electricity consumption, c) installed capacity, and noted that:

1. The surface of the facilities does not generally show a high degree of correlation to the consumption of electricity in all classes of load. 2. On the contrary, the installed capacity has a high degree of correlation (over 90%) to the consumption of electricity and especially at the categories of aviaries, cowsheds, sheepfolds and rabbit farms. 3. In the category of piggeries the installed capacity generally does not give a satisfactory degree of correlation (0.57).[297]

Further study showed, in particular, a high correlation between *installed power* and *consumption*, for surface units up to 1.000 m^2. The same correlation was low and statistically insignificant for units

[296] Initiative Group of Cataractis Community, Arta. Letter to the PPC (21 December 1981). Archives of the Commercial Division of the Non Selected Customers, Central Archives of PPC, Envelope 4.
[297] Dim. Colomvas & T. Fotopoulos-Christodoulakis, *Study relating consumption and surface or installed power in rural electrification customers (Other agricultural uses),* pp. 16-17.

larger than 1.000 m^2. The correlation rate between surface and consumption was statistically significant only in the case of greenhouses, but the coefficient (0.65) showed that consumption is a function of other additional factors.

The findings showed that the basis of calculation should be the *installed power* for the classes of aviaries, piggeries (up to 1.000 m^2 at least), cowsheds, rabbit farms, and sheepfolds; while for the class of greenhouses showed that the calculation based on the *surface* gave comparatively better results. The study data covered a period of eight years (1967-74) in a limited number of units. The units were not uniformly equipped and there was no preliminary study conducted.

6.1. *Irrigability and electrification*

In the middle 1970s, the Ministry of Agriculture focused on the expansion of irrigations to the limit allowed by the country's water resources: They estimated that 1.6 million hectares, approximately 46.4% of the agricultural land (from 3.45 million hectares of the 1977 survey) could be irrigated. The rural electrification was seen as a program of "immediate economic efficiency" and included: The substitution of pumping stations, which had hitherto operated with (expensive) internal combustion engines, with electric pump units. The installation of electric pumping stations on land irrigated for the first time.[298]

[298] Ministry of Agriculture, *Developments in the Greek agriculture during the period 1958-1978, etc.* pp. 38, 44.

In 1976, the cultivated farms in Greece were in total 3,573,100 hectares, of which 938,600 irrigated. In the *lowland* communities, 507,000 hectares of arable land were irrigated, 52,600 hectares of vegetables and other horticultural crops, 12,900 hectares of vineyards, and 95,200 hectares of tree crops (orange, lemon, tangerine, apple, pear, etc.).

In *semi-mountainous* communities 99,000 hectares of arable land, 20,800 hectares of vegetables and other horticultural crops, 4,400 hectares of vineyards, and 33,400 hectares of tree crops were irrigated. In *mountainous* communities 63,100 hectares of arable land, 13,700 hectares of vegetables and other horticultural crops, 2,400 hectares of vineyards, and 34,100 hectares of tree crops.

In 1977, in a total of 3,563,700 hectares of cultivated land, 923,843 were irrigated. That year we had a slight shift toward the mountains, with a reduction of cultivated and irrigated lowland areas, stabilization of semi-mountainous and increase of cultivated and irrigated mountainous areas.

Another important factor is the traditional practice of fallow. In 1977, among 4,049,252 hectares of arable land, about ⅛, i.e. 499,377 hectares were set in fallow.[299] Based on the data for the next years, the goal of expanding irrigation to 50% of arable land was realized with slow steps, while the goal of replacing internal combustion engines with electric pumps was progressing at a rate of 100-250 connections per month.

[299] National Statistical Service of Greece, *Agricultural Statistics of Greece in the year 1977,* tables 1, 1ª.

6.2. *Tropaia in Arcadia*

In the village Tropaia in Arcadia, a few kilometres from the hydroelectric plant of Ladon, the farmers owned 12 tractors (420 HP), in 1971, 30 pumping facilities, 1,600 manual sprayers, 60 motorized sprayers, 1 corn ginning machine and 1 corn grinder. There were also some agricultural industries: seven olive mills, and six dairies.[300]

According to an Official Memorandum, by Mr. Katsiorchis, Agronomist in the Tropaia branch of the Agricultural Bank, the irrigated area was 1,020 hectares, although 83,200 were irrigable. The mountainous and hilly character of the region, putting obstacles to the mechanization of farming, the fragmentation, the small size of holdings, and the lack of labour force had contributed to the reduction of grain cultivation.[301]

On 18.10.1973, the Agronomist Katsiorchis submitted to the local branch of the bank in Tropaia a new memo, remarking that:

> *The rural population of the region is continuously reduced. In the 1961 Census, it was 17,943 persons, while in 1971, amounted to 13,573, i.e. in the elapsed 10 years, suffered a reduction of 24%. This decrease continues today with the same rate".*[302]

[300] Agricultural Bank of Greece, Branch of Tropaia, Technical Service, *Official Memorandum: Agro-economical data at the area of ABG Branch in Tropaia,* 1971.
[301] Agricultural Bank of Greece, Branch of Tropaia, Ibid.
[302] Agricultural Bank of Greece, Branch of Tropaia, Technical Service, *Official Memorandum: Existing general situation, in the area of ABG Branch of Tropaia,* 1973.

Mr. Katsiorchis added that “it is strange and inexplicable that the decrease in population is much higher in the fertile lowlands, rather than in the arid highlands”. In addition, he commented: “The base of the region's economy is livestock in the mountainous parts, livestock and olive in the semi mountainous, and agriculture in the lowland parts”, mainly maize and groundnut (peanut).[303]

According to Mr. Katsiorchis the sheep and goat population decreased due to the lack of open pasture. Nevertheless, in recent years, the dairies in the region numbered seven and succeeded in halting the decline of livestock in the area “due to the shockingly favourable measures implemented for livestock and the relatively high prices for livestock products”.[304]

Three years later, on 17.11.76, the Geotechnical Office of the local Agricultural Bank, computing the “agro-economical” potential in the region of Tropaia, noted, among other things, the following machines: 19 biaxial tractors, 2 uniaxial, 45 pumping stations, 16 olive mills, and 5 dairies.[305]

[303] Agricultural Bank of Greece, Branch of Tropaia, Technical Service, *Official Memorandum: Existing general situation, in the area of ABG Branch of Tropaia,* 1973.
[304] Ibid.
[305] Agricultural Bank of Greece, Branch of Tropaia, Geotechnical Service, Agronomist A. Panopoulos. *Official Memorandum: Agro-economical data at the area of ABG Branch in Tropaia,* 1973.

7. *Rural electrification 1977-80*

In correspondence of the Governor of PPC with the Ministry of Coordination, in 1981, we read: "At present, the following programs are implemented: The Rural Electrification Program of 1,000 million drachmas (approximately), adopted in 1977; The S-PER (80) of 50 million drachmas (approximately), adopted in 1980; The PER-80 of 170 million drachmas (approximately), adopted in 1980".[306]

"Upon completion of the above programs, the country's population that will be served will represent more than 99.5% of the population". To make these programs the PPC received loans and was subsidized by the State "with the interest of the respective loans".[307]

The representative of PPC drew attention to the costly and uneconomic nature of these programs, since "the settlements left for electrification are ever more distant (in mountainous areas, small islands, etc.) and sparsely populated, and their buildings are used for a very short time (resorts)".[308] The cost, utilization and income per capita in these remote areas were, as Mr. Papamantelos argued, very unprofitable. Thus, he proposed that other entities, except PPC, should undertake the electrification of the resorts, ski centres, ports, transmitters. He also asked future costs for rural electrification to be covered by the Public Investments, "not as hitherto with loans to the PPC".[309]

---

[306] PPC, Distribution's Utilization Division, D. Papamantelos, Governor, To the Ministry of Coordination. *Topic: Electrification of the Country – Special Program for Electrification of the Country 1981.*
[307] Ibid.
[308] PPC, Distribution's Utilization Division, D. Papamantelos, Governor, To the Ministry of Coordination. *Topic: Electrification of the Country – Special Program for Electrification of the Country 1981.*
[309] Ibid.

Noteworthy is the finding that there were 296 settlements, nearly 30%, whose electrification delayed or prevented because of deficits found by the study, or because 217 of them “lack accessible road”, and would be electrified only “when a proper way is opened - by the competent authorities - to those settlements”.[310] In 1978, most of the rural electrification projects of the Regional Division of Peloponnese - Epirus were planned (349 projects) and forwarded (232 projects, up to 66.5%) in the region of Nafplion. Overall, across the Peloponnese - Epirus region, 1,647 projects were planned and 1,271 of these were launched, a 77.2% rate.[311]

Analytically, most electrification projects for drainage were launched in 1978 in the areas of Nafplion (278), Tripoli (217), Sparta (210), Pyrgos (147), etc., while in Ioannina only 18 projects of this type were set up. The biggest surface with new connections for irrigation was found in Laconia (10,370 hectares). In contrast, most of the other loads works, except irrigation, i.e. electrification of aviaries, cowsheds, etc., were launched the same year in the Ioannina region: 123 of the sum of 273 promoted across the whole Regional Division.[312] *Innovative uses*, or simply new connections of rural electrification, were included in the table of other agricultural uses: In a sum of 273 connections in the year 1978, across the Peloponnese-Epirus Region, were included one milk pre-refrigeration station, one brooder, 4 fishponds, 6 greenhouses, 115 sheepfolds, 41 cowsheds, 44 piggeries, and 61 aviaries.

[310] PPC, Distribution’s Utilization Division, Ibid., table.
[311] PPC, Regional Division of Peloponnese-Epirus, *Statistical data of Rural Electrification in 1978-79:* table 3.
[312] PPC, Regional Division of Peloponnese-Epirus, Ibid., table 5.

A 75.9% of expenditure on rural electrification projects related to expansion, 9.3% to supply, 14.8% to support. The PPC attended by 47.4% of the expenditure, allocating 199.86 million drachmas throughout the Peloponnese region - Epirus, while consumers by 7.4% and public investment by 45.2%.[313]

8. *Categories of consumers and prices*

The prices of electricity between 1976 and 1981 increased by nearly the same rate for irrigation and other rural consumption. The table shows the course of prices in the period 1976-1981:

	LV Consumers		**MV Consumers**	
Year	Industrial	Rural	Industrial	Rural
1976	1,907	1,274	1,005	1,187
1977	2,091	1,326	1,072	1,191
1978	2,372	1,595	1,245	1,418
1979	3,062	2,113	1,607	1,847
1980	4,127	2,995	2,279	2,518
a΄ half 1981	5,287	3,654	3,078	3,493
increase '76-'81	177,2%	186,8%	206,3%	194,3%

Price index (drachmas / KWh)

An increase in prices ranging to 177.2% (Low Voltage industrial consumers) as well as 206.3% (Medium Voltage industrial consumers) was remarkable.[314]

[313] PPC, Regional Division of Peloponnese-Epirus, *Statistical data of Rural Electrification in 1978-79:* table 9.

[314] PPC, *Remarks on the report by the Ministry of Agriculture (8.1.82), "Measures for relieving Agriculture from power expenses etc. and for the promotion of Rural Electrification".*

The agricultural as well as industrial use, were exempted from turnover tax. However, the value of the electricity consumed by livestock enterprises was not exempted.

A new effort to reduce agricultural tariffs at the same time, provided for a reduction of 43% in LV and 37% in MV and exemption of the producers from the cost of electricity for drainage. Especially for irrigation consumers, regarding their "minimum charge", in 1981, the tariffs were as follows:

> *- For low voltage (LV) consumers and the few medium voltage (MV) consumers included in irrigation tariffs, the "minimum charge" is calculated on an annual basis and is a function of the maximum absorbed power within the year. If this power is not measured (for many small irrigation consumers i.e. power up to 25 KVA) or is zero, the annual "minimum charge" is a function of the power installed.*
>
> *- For consumers MV included in MV tariff the corresponding monthly "minimum" tariff is applied.*[315]

There existed indeed consumers "with zero power consumption through the year", most of which either had changed the cultivation to non-irrigated or irrigated from other sources (another well or watered from collective wells) without care for annulment of the power supply not used.

[315] PPC, *Remarks on the report by the Ministry of Agriculture (8.1.82), "Measures for relieving Agriculture from power expenses etc. and for the promotion of Rural Electrification".*

Nationwide, from 1961 to 1967, the consumption of electricity, or else the demand, rose gradually from 2,095 GWh per year to 5,979 GWh. In agricultural use, demand was much lower: 31 GWh in 1961, 39 GWh in 1964, and 74 GWh to 1967; while in 1969 the demand for agricultural use was 105 GWh, a percentage of 1.41% of the total, and in 1974 was 207 GWh, 1.61% of the total.

In 1980, the demand for electricity for agricultural use totalled 400 GWh, 1.99% of the total. Noticeable increase occurred throughout the early 1980's: in 1981, the agricultural demand was 466.33 GWh, while in 1985 the consumption of electricity in agriculture totalled 900 GWh, which accounted for 3.73% of the total. In 1989, the demand for agricultural use reached 1.177 GWh, 4.14% of the total and in 1991 the 1.320 GWh, 4.45% of the total.[316]

While in 1980, there were 77,907 consumers for agricultural use, in 1989, the consumers of electricity for agricultural use had increased to 129,683, that were 2.99% of the total, and in 1990, there were 135,484 farming consumers, a 3.07% of the total.[317]

In the last years of the 20th century, the consumption of electricity for agricultural use increased proportionately. In 1993, the consumption for agricultural use was 2.039,8 GWh, a percentage 6.57% of the total, increased compared to the past. In 1997, consumption for agricultural use reached 2.282,4 GWh, 6.24% of the total.

---

[316] Tsotsoros N. Stathis. *Energy and Development in the post-War period. The Public Power Corporation. 1950-1992: Development and Crisis.* Appendixes, table 4.2.
[317] Control Council of the Public Power Corporation, *Report for the PPC administration in the fiscal year 1990,* p. 43.

9. *The effects of modernization*

After the war, there was a vast mechanization of the Greek agriculture, which was in line with growing debts to the Agricultural Bank and reduction of the demand for workers. If e.g. in 1950 needed 17-18,000 persons to process 20-25,000 tones of tobacco (about 1,300 kg per worker), in 1965 only 5-6,000 workers were processing 45,000 tons of tobacco (about 8,200 kg per worker).[318]

In 1955, there were 8,450 tractors in Greece and 700 combines. Between 1950-70, the increase in the number of tractors was rapid:

Year	Number of tractors
1950	4.000
1956	10.500
1961	23.000
1966	60.000
1970	102.320

Source: NSSG, 1970

During the period 1950-80, the technological modernization of the rural economy did not go evenly. The lion's share of the industrial infrastructure of the country was in Attica.

The company "Technical S. Malkotsis", for example, founded in 1934, manufactured in the 1950's three types of diesel engines for the needs of agriculture, 5-9 hp, 8-12 hp and 15-18 hp.[319] Until 1955, 20,000 Malkotsis' engines had been absorbed by agriculture and a new diesel engine was planned for shipping and fishing.

[318] Patiniotis Nikitas. *Dependence and Migration. The case of Greece.* Athens, p. 179.
[319] I.M., "The visit of the King in the facilities of the Metal-industry "Technical S. Malkotsis". *Industrial Review,* 22nd vol. (1955), p. 285.

Moreover, the Agricultural Bank had ordered to the Malkotsis company the construction of 1000 diesel motors; there were several private orders by farmers, and, as it was written by the *Industrial Review:*

> *25 monitoring centers were being established in the provinces; the company secured the oversight on maintenance, on direct supply with spare parts and, in general, on supporting the farmer in his cultivating needs.*[320]

Another company, the ATEME, a representative of foreign companies, manufactured around 1956, in partnership with BIO, turbines and pumps, ordered by the Ministry of Agriculture. Those pumps were suitable for drilling 4, 6 and 8-inch drillings, up to 120 meters depth and with a performance up to 180 cubic meters per hour. Engines of the Greek manufacturing factory ELVIMA powered the pumps.[321]

At the end of this period (1950-80), the progress of rural electrification in the Peloponnese region was shown by the number of electric pumps that were found in Morea, e.g. in 1977. We found there a total of 20,938 pumps, i.e. ⅓ of the number of electric pumps, established in Greece (62,182).

The only areas of the country where the electric pumps were more than petrol or gasoline, were Peloponnese and Central Greece. In Central Greece and Evia, the electric pumps were

[320] I.M., "The visit of the King in the facilities of the Metal-industry "Technical S. Malkotsis". Ibid.
[321] F. Konstantinidis, "The municipal and communal authorities of the country in the hives of industrial creation". *Industrial Review,* 23rd vol. (1956), p. 583.

14,778. By contrast, in all other areas either gasoline pumps surpassed (such as in the Ionian islands, with 3,755 gasoline, compared with 623 electric and 347 petrol pumps, and in the islands of the Aegean, where gasoline pumps were 15,649, the petrol 5,065 and the electric 3,872) or petrol pumps were more (as in Epirus, Thessaly, Macedonia, and Thrace).[322]

Type of farming machinery	Total sum of communities		Lowland communities		Semi-mountainous communities		Mountainous communities	
	1976	1977	1976	1977	1976	1977	1976	1977
Tractors	167.300	181.600	109.022	117.377	36.291	39.740	21.987	24.483
Tractors under 18 HP	64.644	68.950	34.907	36.712	16.451	17.972	13.286	14.266
Combines	5.511	5.294	4.492	4.150	771	826	248	318
Simple reapers	4.669	4.980	3.274	3.573	871	873	524	534
Threshing machines of any kind	881	881	540	524	234	216	107	141
Simple windrowing	6.398	6.910	4.741	5.150	1.124	1.185	533	575
Ginning maize	2.234	2.214	1.376	1.332	529	565	329	317
Milk separators	2.833	2.336	1.515	1.077	519	509	799	750
Petrol pumps	88.233	91.093	64.431	66.294	17.457	18.067	6.345	6.732
Gasoline pumps	84.763	84.551	51.136	50.101	20.903	21.187	12.724	13.263
Electric pumps	58.392	62.182	41.922	43.864	13.054	14.352	3.416	3.966
Steam pumps, etc.	13.797	14.037	2.230	2.500	9.298	9.138	2.269	2.399

Source: National Statistical Service of Greece, Agricultural Statistics of Greece Year 1977, Table 8

In Crete also, we encountered the survival of older technologies, i.e. 11,299 treadmills, wells and steam pumps (which constituted the vast majority, a percentage of 80.49% from the 14,037 wells of this

[322] National Statistical Service of Greece. *Agricultural census in the year 1977,* table 8a.

type in the whole of Greece). The vast majority of wells and steam pumps were located in the prefecture of Lassithi, numbering 11,064, 54.17% of all steam pumps of the county. That year in Lassithi, only 680 electric pumps were used.

A great impression was also caused by the fact that in the granary of Thessaly there was a relatively small number of tractors, i.e. 19,417 tractors, only 10.69% of the total number in the country. We can also see that in Thessaly the farmers had mostly big tractors, over 18 HP, while tractors with lower horsepower were few (only 1,274), i.e. 6.56% of all tractors in Thessaly. This is partially explained by the flat character of the region of Thessaly. The same thing happened in Macedonia, where 52,339 tractors were found, 28.82% of the total number in the country. The vast majority, i.e. 49,387 tractors of Macedonia, a rate of 94.35%, were large tractors over 18 HP.

By contrast, in the Peloponnese, with a diverse topography, the 69.83% of tractors were small, less than 18 HP. In Epirus, also they had little tractors, only 2,567, up to 1.41% of the total number of tractors in the country. The number of tractors in Thrace was 11,620, i.e. 6.39% of the total, in Crete 25,866, i.e. 14.24%, in Central Greece 22,662, i.e. 12.47%, etc.

Bibliography

- Acheson Dean. *Present at the Creation. My years in the State Department.* New York-London: 1987.
- Adams J. “Principals and Agents, Colonialists and Company Men: The Decay of Colonial Control in the Dutch East Indies”. *American Sociological Review,* 61(1), 1996, pp. 12-28.
- Albauch Leland G. *Crete, A Case Study of an Underdeveloped Area.* New Jersey: Princeton University Press, 1953, pp. 245-46. Available at: http://www.questia.com/PM.qst?a=o&d=476749
- Amin S. and Vergopoulos K. *La question paysanne et le capitalisme*. *Paris:* éditions anthropos – idep., 1974.
- Antonopoulou Sofia. *The After War Economy and the Housing Phenomenon* (Special Lessons of City Planning I, 7th Semester). Athens: National Technical University, Department of Architecture Engineering, Sector: City and Social Practices, 1989.
- Apostolides A. *How similar to south-eastern Europe were the islands of Cyprus and Malta in terms of agricultural output and credit? Evidence during the interwar period.* Working Paper 80, South Eastern European Monetary History Network. Athens: Bank of Greece, July 2008.
- Arensberg C.M. “The Community as object and as sample”. *American Anthropologist,* 2, 1963.
- Babanasis S. and Soulas C. *The Greece in the periphery of the developed countries.* Athens: Themelio, 1976.

- Balfousias Stella. *Demand for Electric Energy in the presence of a two block declining Price Schedule.* Centre of Programming and Economic Research. February 1993, Works for Discussion (No 40).
- Balfousias Stella. *Cost and Productivity in Electricity Generation in Greece.* Centre of Programming and Economic Research. January 1995, Works for Discussion (No. 41).
- Barkan Ö. L. "Aperçu sur l'histoire des problèmes agraires des pays balkaniques". In: *Revue de la Faculté de Sciences Économiques,* Université d' Istanbul, Octobre 1945 – Juillet 1946.
- Basalla G. *The Evolution of Technology.* Cambridge University Press: 1996.
- Beall R.T. «Rural Electrification». In *Yearbook of the United States Department of Agriculture.* U.S. Dept. of Agriculture, 1940.
- Beers H.W. "Survival capacity of extension work in Greek villages". *Rural Sociology* XV/3, 1950, pp. 274-282.
- Bernstein H. "Notes on Capital and Peasantry". In: *Rural Development: Theories of Peasant Economy and Agrarian Change.* London: J. Harriss, Hutchinson University Library for Africa, 1982.
- Bika Zografia. "A survey of academic approaches to agrarian transformation in post-war Greece." *Journal of Peasant Studies,* 34 (1), 2007, pp. 69-90.
- Birchall Johnston. *Co-op, The people's business*. Manchester University Press, 1994.

- Botsiou K.E. “New Policies, Old Politics: American Concepts of Reform in Marshall Plan Greece”, *Journal of Modern Greek Studies,* 27 (2), 2009, pp. 209-240.
- Braudel F. *Civilization and Capitalism, 15th-18th Century*. University of California Press. 1982.
- Braudel F. *Civilization and Capitalism 15th–18th Century*, Vol. 3, *The Perspective of the World*. London: Collins and Fontana, 1988.
- Braudel F. *Civilization and Capitalism 15th–18th Century*, Vol. 1, *The Structures of Everyday Life.* London: Collins and Harper and Row, 1981.
- Brenner R. “Economic Backwardness in Eastern Europe in Light of Developments in the West”. In: Daniel Chirot (ed.). *The Origins of Backwardness in Eastern Europe: Economics and Politics From the Middle Ages Until the Early Twentieth Century.* Berkeley and Los Angeles: University of California Press. 1991.
- Buchanan R.A. “Public Utilities”. In: I. McNeil (Ed.). *An Encyclopaedia of the History of Technology*. London: Routledge, 1990, pp. 949-966.
- Burgel Guy. *Pobia, etude géographique d’un village crétois.* Athens: National Social Research Centre, 1965.
- Campbell M.J. (editor). *New Technology and the Rural Development. The Social Impact.* Routledge, 1990.
- Chakravorty Sanjoy. *Fragments of Inequality, Social, spatial, and evolutionary analyses of income distribution*. Routledge, Taylor & Francis Group, New York, London, 2006.

- Champagne P. “La restructuration de l’espace villageois”. *Actes de la Recherche en Sciences Sociales 4*, 1975.
- Chang Claudia. “Pastoral Transhumance in the Southern Balkans as a Social Ideology: Ethnoarcheological Research in Northern Greece”. *American Anthropologist,* 95 (3), 1993, pp. 687-703.
- Ciobanu Cl., Mattas K. and Psaltopoulos D. “Structural Changes in Less Developed Areas: An Input-Output Framework”. In: *Regional Studies,* Aug. 2004, Vol. 38 (6), pp. 603-614.
- Commission Européenne. *La situation de l’Union Européenne.* Rapport, Brusselles-Luxemburg, 1995.
- Control Council of the Public Power Corporation, *Report for the PPC administration in the fiscal year 1990.* Athens.
- Coopersmith Jonathan. *The Electrification of Russia, 1880-1926.* Ithaca and London: Cornell University, 1992.
- Crockett Jean. *Consumers’ expenses and incomes in Greece.* Athens: Centre of Programming and Social Research, 1970.
- Damianakos S. “Repères pour une problématique de l’insertion politique de la paysannerie en France et en Grèce”. In: *Le monde rural dans l’aire méditerranéenne.* Athènes : EKKE – KNE/EIE, 1988, pp. 552-572.
- Damianakos S. “The Ongoing Quest for a Model of Greek Agriculture”. *Sociologia Ruralis* 36 (2), 1997, pp. 190-208.
- Damianakos S., Handman M.-É., Pitt-Rivers J. and Ravis-Giordani G. *Les amis et les autres, Mélanges en l’ honneur de John Peristiany, Brothers and others, Essays in Honour of*

John Peristiany. Athènes: Centre National des Recherches Sociales (EKKE), 1995.
- Damianakos S. *From the peasant to the farmer. The Greek Rural Society toward Globalization.* Athens: Exantas / EKKE, 2002.
- Dertilis G.V. *History of the Greek State, 1830-1920* (4th Edition). Athens: Estia, 2006.
- Etmektsoglou G. "Axis Exploitation of Wartime Greece". Atlanta: Emory University, 1995.
- Etmektsoglou G. "Greek Economy during German Occupation". In *History of the Greek Nation,* Volume 16 (2nd Edition). Athens: Athens Publishing, 2008.
- Evelpidis C. *The Agricultural Crisis, especially in Greece*. Re-edition from the Archive of Economic and Social Sciences (Volume 11). Athens, 1931.
- Evelpidis C., Professor in the Panteion School of Political Science. *Agrarian Legislation and Agricultural Policy* (Concise University Lessons). Athens: Papazisis, 1943.
- Evelpidis C. "Review of the Greek Agricultural Economy". In: *Agricultural Economy,* January-March 1957.
- Evelpidis C. *The Agriculture of Greece, Economic and Social aspect.* Athens: Editions "The Word", 1944.
- Evelpidis C. *The electricity in the countryside.* Athens: Papazisis, 1943.
- Evelpidis C. *Theory and Practice of Agricultural Policy.*
- Fikioris J. "Telecommunications in Greece - Present and Future". *Communications*, *IEEE Transactions on Communications,* 22 (9): 1467 - 1469.

- Filias V.I. *Problems of Social Transformation.* Athens: Papazisis, 1974.
- Fried M.H. *The Evolution of Political Society: An Essay in Political Anthropology.* New York: Random House, 1967.
- Friedl E. *Vasilika. A village in Modern Greece.* New York: Holt, Rinehart and Winston, 1962.
- Gelderblom O. and Jonker J. "Completing a Financial Revolution: The Finance of the Dutch East India Trade and the Rise of the Amsterdam Capital Market, 1595-1612". *The Journal of Economic History,* 64 (3), 2004, pp. 641-672.
- Ghatak Subrata and Ingersent Ken. *Agriculture and Economic Development.* Harvester Press, 1984.
- Giannoulopoulos I. "The economy from 1919 to 1923". In: *History of the Greek Nation,* Volume 15 (2nd Edition). Athens: Athens Publishing, 2008.
- Gidarakou I. "Young Women's Attitudes Towards Agriculture and Women's New Roles in the Greek Countryside: A First Approach". *Journal of Rural Studies,* 15 (2), 1999, pp. 147-158.
- Gizelis G., Myrizakis I., Passa-Gardiki O. and Teperoglou A. "Cultural activities within the family. First results of an investigation". *Review of Social Research*, b and c quarter 1980.
- Grimm, T. "Tradition und Revolution in China. Überlegungen zur Konsistenz asiatischer Traditionen". *Historische Zeitschrift*, 204 (1), 1967, pp. 79-103.

- Hartwell, R. M. Demographic, Political, and Social Transformations of China, 750-1550. *Harvard Journal of Asiatic Studies*, 42 (2), 1982, pp. 365-442.
- Hatzivassiliou, E. “Greek Reformism and its Models: The Impact of the Truman Doctrine and the Marshall Plan”. *Journal of Modern Greek Studies*, 28 (1), 2010, pp. 1-25.
- Hay P. “Environmental Philosophy”. In: Krech S. III et al. (Eds.). *The Encyclopaedia of the World Environmental History.* London: Rutledge, 2004.
- Hellenic Republic. *National Accounts of Greece, 1958-1975.* Athens: Ministry of Coordination, General Administration of National Accounts. 1976.
- Herzfeld M. *A Place in History: Social and Monumental Time* Princeton, NJ: Princeton University Press, 1991.
- Herzfeld M. *Ours Once More: Folklore, Ideology and the Making of Modern Greece.* Austin, TX: University of Texas Press, 1982.
- Hessen B. *The Social and Economic Roots of Newton’s Mechanics.* New York, 1971.
- Hopkins Terence K. and Wallerstein Immanuel, coordinators. *The Age of Transition.* London: Zed Books, 1996.
- Jellison K. *Entitled to Power, Farm Women and Technology, 1913-1963,* Gender and American Culture. Chapel Hill & London: The University of North Carolina Press, 1993.
- Jollivet M. “Sociétés rurales et capitalisme”. In: M. Jollivet (ed.), *Sociétés paysannes ou lutte de classes au village?* Paris : A. Colin, 1974, pp. 230-266.

- Jollivet M. *Pour une science sociale à travers champs. Paysannerie, ruralité, capitalisme (France XX e siècle).* Paris: Éditions Arguments, 2001.
- Kakridis, A. “Deus ex machina? Truman/Marshall Aid, Engineers, and Greece's Post-war Development Discourse”. *Journal of Modern Greek Studies,* 27 (2), 2009, pp. 241-274.
- Kallivretakis L. *The dynamics of rural modernization in 19th century Greece.* Athens: Educational Institute of Agricultural Bank, 1990.
- Kapetanios A.V. *Landscape Architects, come quickly to this land... The miracle called Greek Landscape!* Athens: Filippoti, 2009.
- Karagiannis S. and Nicholaou A. "Industrial Policy in the first post-war decades." In: *The Greek society during the first post-war period (1945-1967).* Athens: Sakis Karagiorgas Foundation, 1993.
- Karakasidou A. *Fields of Wheat, Hills of Blood: Passages to Nationhood in Greek Macedonia, 1870–1990.* Chicago, IL: University of Chicago Press, 1997.
- Karavidas, K. D. *Agricultural Matters. Comparative Study.* Athens: Agricultural Bank of Greece, 1978 (1st Edition: 1931).
- Kazakos P. "The Greek Economy, 1949-1967: Reconstruction and Development". In *History of the Greek Nation,* Volume 16. Athens: Athens Publishing, 2000.
- Kevork K.H., Spartidis, A.S. and Tzortzopoulos, P.T. *The demand for durable consumption goods. Econometric research.* Athens: Bank of Greece, 1964.

- Kitsikis N. “Preface” in D. Mpatsis, *The heavy industry in Greece.* Athens: Kedros, 1977.
- Kizos T. “Multifunctionality of farm households in Greece”. In: *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography,* 64 (2), 2010, pp. 105-116.
- Kline R. *Consumers in the Country, Technology and Social Change in Rural America.* Baltimore and London: The John Hopkins University Press, 2000.
- Konstantinidis F. "The electrification of the whole of Greece, as displayed at the booth of PPC in the Exposition of Thessaloniki”. *Industrial Review,* 24, 1957, pp. 641-650.
- Koutsouris A. “The Battlefield for (Sustainable) Rural Development: The Case of Lake Plastiras, Central Greece”. *Sociologia Ruralis,* 48 (3), 2008. Available at: http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9523.2008.00465.x/pdf
- Kydoniatis, S.P. “The position of the Greek village”, *Antaeus,* Year A, 3: 75-77, 90 & 4, 1945, pp. 109-113.
- Laimos, A. *The navy of the Greek Nation* (2 volumes). Athens: Tsikopoulos. 1969.
- Lamarche H. “Les logiques productives”. In : H. Lamarche (ed.), *L’agriculture familiale, II, Du mythe à la réalité,* L’Harmattan, Paris, 1994, pp. 49-73.
- Landes, David S. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750.* Cambridge, Engl.: University Press, 1969.
- Lefebvre H. *Du rural à l’urbain*, Paris : éditions anthropos, 1970.

- Leontaritis G. “Economy and Society from 1914 to 1918”. In: *History of the Greek Nation,* Volume 15 (2nd Edition). Athens: Athens Publishing, 2008.
- Lien-Sheng Yang. “Government Control of Urban Merchants in Traditional China”. *The Tsing Hua Journal of Chinese Studies,* 8 (2), 1970, pp. 186-209.
- Lipton M. and Longhurst R. *New Seeds and Poor People*. Baltimore: John Hopkins University Press, 1989.
- Malassis L., Padilla M., Ghersi G., Lalonde L.G., et alii. *Économie Agroalimentaire, Concepts et methods, Economies et Sociétés,* Cahiers de l’ISMEA. Revue fondée en 1944, par François Derroux, Tome XXVI, No 6, Juin 1992.
- Marx K. *The Capital.* Athens: Modern Era, 1978.
- McNall S.G. “Barriers to Development and Modernization in Greece”. In: M. Dimen and E. Friedl (eds.), "Regional Variation in Modern Greece and Cyprus: Towards a Perspective of the Ethnography of Greece”. New York: *Annals of the New York Academy of Sciences,* 268, 1976.
- McNeil I. (Ed.). *An Encyclopaedia of the History of Technology.* London: Routledge, 1990.
- McNeill W.H. “Dilemmas of Modernization in Greece”. *Balkan Studies* 8, 1976.
- McNeill W.H. *The Greek Dilemma, War and Aftermath.* Victor Gollancz Ltd, 1947.
- McNeill, W.H. *Plagues and People.* Oxford: Blackwell, 1977.
- McNeill, W.H. *The Pursuit of Power. Technology, Armed Force, and Society since A.D. 1000.* The University of Chicago Press, 1982.

- McNeill, W.H. *The Metamorphosis of Greece since World War II.* Chicago and London: The University of Chicago Press, 1978.
- Mendras H. “Économie et Sociabilité”. In: *Cahiers de l’observation du Changement Social.* Paris: C.N.R.S., 1980, v. 3.
- Mendras H. *Six villages d'Epire, problèmes de développement socio-économique.* UNESCO, Reports 11, 1961.
- Mendras H.. *La fin des paysans.* Paris: Sedeis, 1967/84.
- Merton R. *Éléments de théorie et de méthode sociologique,* Παρίσι, Plon, 1966.
- Meynaud J. *Les forces politiques en Grèce.* Paris: Etudes de Science Politique, 1965.
- Michailidis A., Koutsouris A. and Mattas K. “Information and Communication Technologies as Agricultural Extension Tools: A Survey among Farmers in West Macedonia, Greece”. *The Journal of Agricultural Education and Extension,* 16 (3), 2010, pp. 249-263.
- Midlarsky M. I. *The Evolution of Inequality: War, State Survival, and Democracy in Comparative Perspective.* Stanford, CA: Stanford University Press, 1999.
- Milios J. “Asiatic Mode of Production”. In: *Encyclopedia of Political Economy*, edited by Phillip Anthony O'Hara, Routledge Publishers, London 1999, pp. 18-20.
- Milios J. “Is the "anti-imperialism" a left-wing ideology and politics?” *Theseis*, 88*,* 2004.
- Milios J. und Sotiropoulos D. “Marxsche Theorie und Imperialismus”. PROKLA 159, Juni 2010.

- Moissidis Antonis. *The rural economy in modern Greece. Production and Social Structure (1950-80).* Athens: Foundation of Mediterranean Researches, 1986.
- Moissidis A. *Rural society in modern Greece. Productive and social structure in Greek agriculture (1950-80).* Athens: Foundation of Mediterranean Studies, 1986.
- Mpatsis D. *The heavy industry in Greece.* Athens: Kedros, 1977.
- National Statistical Service of Greece. *1974. Standards of living - private income and expenses.* Athens, 1977.
- National Statistical Service of Greece. *Agricultural Statistics of Greece in the year 1977.*
- National Statistical Service of Greece. *Statistics of Communications and Transportation*. Athens, 1974.
- National Statistical Service of Greece. *Household Budget Survey, conducted in urban areas of Greece during 1957-1958.* Athens, 1961.
- National Statistical Service of Greece. *Household Budget Survey, conducted in suburban and rural areas of Greece during 1963-1964.* Athens, 1969.
- National Statistical Service of Greece. *Results of the Agricultural Census in the year 1961.* Athens, 1958.
- National Statistical Service of Greece. *Results of the Agricultural-Livestock Census on 19th March 1961*, Vol. I. Athens, 1966.
- Naval Intelligence Division. *Greece, G. H. S.,* v. I: *Physical Geography, History, Administration and Peoples,* v. II,

Economic Geography, Ports and Communications, v. III: *Regional Geography,* 1944-45.
- Nye D.E. *Electrifying America, Social Meanings of a New Technology, 1880-1940.* Cambridge, Massachusetts: The MIT Press, 1997.
- Nye D.E. *Technology Matters, Questions to live with.* Cambridge, Massachusetts: The MIT Press, 2006.
- Pacey A. *The Technology in World Civilization.* Athens: Cultural Technological Foundation of ETBA, 1996.
- Paine, L.P. "Maritime History". In: W. H. McNeill et al. (Eds.). *Berkshire Encyclopaedia of World History* (Vol. 3), Great Barrington, Massachusetts, 2005, pp. 1188-1195.
- Panitsidis G. *Marxism and the Agrarian Question in Greece.* Athens: Modern Age, 1984.
- Papathanassiou et. al. *The system of trading and transporting fruits and vegetables in Greece.* Athens: KEPE, 1978.
- Patellis G. "Elements of the Greek countryside". In: *Technical Chronicles,* August 1978, year 47.
- Pepelasis A. and Panayiotopoulos P.K. *The overflowed labour in Greek agriculture, 1953-1960,* Athens: Centre of Economic Research, 1962
- Perez C. Finance and technical change*:* A Neo-Schumpeterian perspective. In: H. Hanusch and A. Pyka, eds. *The Elgar Companion to Neo-Schumpeterian Economics*. Cheltenham: Edward Elgar, 2004*.*
- Peristiany J.-G. (ed.). *Contributions to Mediterranean Sociology, Mediterranean Rural Community and Social*

Change Acts of the Mediterranean Sociological Conference, Athens, July 1963. Paris, The Hague: Mouton & Co, 1968.

- Peristiany J.-G. (ed.). *Honour and Shame, The values of Mediterranean Society.* London: Weidenfeld and Nicholson, 1965.
- Petropoulos J. and Koumarianou A. “Otto's reign: 1833-1862”. In: *History of the Greek Nation,* Volume 13 (2nd Edition). Athens: Athens Publishing, 2000.
- Pezopoulos G.N. *The Development of Electric Energy in Continental Greece.* Athens: Ministry of Coordination – Coordination Agency, 1949.
- Philips J.M. “Farmer Education and Farmer Efficiency”. In: *Economic Development and Cultural Change,* 43 (1), October 1994, pp. 149-165.
- Pilitsis G. “The Gardens of Adonis In Serres Today”. *Journal of Modern Greek Studies* 3 (2), 1985, pp. 145-166.
- Pinstrup-Andersen P. and Hazell P. “The Impact of the Green Revolution and Prospects for the Future”. *Food Reviews International 1*, 1985, pp. 1-23.
- Popper K. *The poverty of historicism*. London: Routledge, 1957.
- Pretty J.N. *Regenerating Agriculture, Policies and Practice for Sustainability and Self-Reliance.* London: Earthscan Publications Ltd, 1995.
- Psyroukis N. *History of Modern Greece.* Athens: Epikairotita. 1975.
- Public Power Corporation. *Annual Report in the Fiscal Year 1952-1953.* Athens, 1953.

- Public Power Corporation. *Annual Report in the Fiscal Year 1953-1954.* Athens, 1954.
- Public Power Corporation. “Statement”. Newspaper *Eleftheria,* Athens, 18.11.1956.
- Public Power Corporation. “The Report of the Board of the Public Power Corporation”. Athens, 1956.
- Raftopoulos T.I. *The National Electric Network of Greece.* Athens: Papazisis, 1946.
- Sakantanis K. “The problem of agricultural funds in Greece”, *Antaeus,* 2nd Year, 1945.
- Schirokauer C. “Balazs on China”. *Journal of the History of Ideas,* 26 (4), 1965, pp. 593-597.
- Schivelbusch W. *Disenchanted Night, The Industrialization of Light in the nineteenth century* (transl. by Angela Davies). Los Angeles, London: The University of California Press, Berkeley, 1995.
- Scott J. *Weapons of the Weak: Everyday Forms of the Peasant Resistance.* New Haven, Conn.: Yale University Press, 1985.
- Serres M. *The natural contract.* Ann Arbor: University of Michigan Press, 1995.
- Servolin C. “Aspects économiques de l’absorption de l’agriculture dans le mode de production capitaliste”. In: *L'Univers politique des paysans*. Paris: F.N.S.P./ A. Colin, 1972.
- Simon L. *Dark Light. Electricity and Anxiety from the Telegraph to the X-Ray.* Orlando: Harcourt, 2004.

- Simopoulos K. *Foreign Passengers in Greece*. Athens: Stachy, 1999.
- Sfikas T. *The British Labour and the Greek Civil War. The Imperialism of 'Non-Intervention'.* Athens: Filistor, 1997.
- Sjoberg G. *The Pre-Industrial City.* Rotterdam: The Free Press, 1960.
- Stephanides J.D. "The foreign relations of Greece, 1949-1955: In Search of Security". In: *History of the Greek Nation,* Volume 15 (2nd ed.). Athens: Athens Publishing, 2008.
- Supreme Reconstruction Council. *Revised Program for the Economic Recovery of Greece 1949-1950.* Athens: Ministry of Coordination, 1949.
- Sutton S.B. "Disconnected Landscapes: Ancient Sites, Travel Guides, and Local Identity in Modem Greece". *Anthropology of East Europe Review,* 2010.
- Sutton S.B. "What Is a "Village" in a Nation of Migrants?" *Journal of Modern Greek Studies*, 6 (2), 1988, pp. 187-215.
- Svolopoulos K. *The Greek foreign policy 1945-1981* (8th ed.) Athens: Estia, 2008.
- Synarelli M. *Roads and Ports in Greece 1830-1880.* Athens: Cultural and Technological Foundation of the ETBAbank, 1989.
- Tarsouli G. "Civilization in the Greek village. Light in Tsoukaleika. Electrification and countryside". *Industrial Review,* 277, 1957, pp. 45-48.
- Telecommunications Organization SA. *Exposition of the Balance Sheet and Annual year 1962. Eleventh Economic Use.* Athens, 1963.

- “The electrification program is now entering a novel phase”. Newspaper *Macedonia,* Thessaloniki, 15.08.57.
- Tolley S.G., Upton W.C. and Hastings V.S. *Electric Energy availability and regional growth.* Cambridge, Massachusetts: Ballinger Publishing Company, 1977.
- Truman H. *Memoirs. Years of Trial and Hope.* New York, 1965.
- Tsotsoros N. Stathis. *Energy and Development in the post-War period. The Public Power Corporation. 1950-1992: Development and Crisis.* Athens: National Research Foundation, 1995.
- Turvey R. and Anderson D. *Electricity Economics, Essays and Case Studies, Published for the World Bank.* Baltimore and London: The Johns Hopkins University Press, 1977.
- UNIPEDE, European Community Committee. *Programmes and prospects for the electricity sector 1981-1986 and 1987-1990,* 11th issue, August/September 1981.
- United Nations, Economic Commission for Europe, Committee of Electric Power. *Method for evaluating the economic efficiency of Hydro-Electric power plants taking also into account their contribution to the system reliability index.* Symposium on the prospects of hydroelectric schemes under the new energy situation and on the related problems, Athens, 5-9 November 1979.
- Van Boeschoten Riki. “The Farmers and the CPG. Popular Communism in the period of Resistance and Civil War”. *Ta Istorika,* 21, December 1974, pp. 365-390.

- Vassilakopoulos S. *The Redemption of the Electric Companies in Greece.* In: Public Power Corporation, Education Division, *Scientific Bulletin,* 25, Year 7th. Athens, June 1980.
- Vassilakopoulos S. *The Redemption of the Electric Companies in Greece.* In: Public Power Corporation, Historical Monographs, Issue 1. Athens: 1979.
- Vaxevanoglou A. *The social reception of innovation. The example of electrification in the interwar Greece*. Athens: Centre for Neohellenic Research of the National Hellenic Research Foundation, 1996.
- Veremis I. “The economy from 1923 to 1926”. In: *History of the Greek Nation*, Volume 15 (2nd Edition). Athens: Athens Publishing, 2008.
- Vergopoulos K. "The Greek economy from 1926 to 1935”. In: *History of the Greek Nation,* Volume 15 (2nd Edition). Athens: Athens Publishing, 2008.
- Vermeulen H. “Conflict and peasant protest in the history of a Macedonian village, 1900-1936”. *Social Research Review* (special issue), 1981, pp. 93-103.
- Vidal de la Blache P. *Principes de géographie humaine*. Paris: Utz, 1995 (1st ed. 1922, Paris : A. Colin).
- Wallerstein I. *The modern world system I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century.* New York: Academic Press, 1974.
- Wallerstein, I. "Beyond Annales." *Radical History Review*, 49 (3), 1991.
- Wallerstein I. *The Modern World System II: Mercantilism and the Consolidation of the European World-Economy, 1600-*

1750. New York: Academic Press, 1980.

- Wallerstein I. *The Modern World System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730-1840s*. New York: Academic Press. 1989.
- Ward B. *Greek Regional Development.* Athens: Centre of Economic Research, 1963.
- Wood Ellen Meiksins. 2002. *The Origin of Capitalism: A Longer View.* London: Verso.
- Zaharopoulos T. "The Evolution of Public Service Radio Broadcasting in Greece: From Authoritarianism to Anarchy and Irrelevance". *Global Media Journal* (on-line journal), 2002, 1. Available at: http://lass.calumet.purdue.edu/cca/gmj/fa02/gmj-fa02-zaharopoulos.htm
- Zaharopoulos T. "The Rise and Fall of Municipal Radio in Greece". *Journal of Radio Studies,* 10 (2), 2003.
- Žmolek M.A. *Rethinking the Industrial Revolution. Five Centuries of Transition from Agrarian to Industrial Capitalism in England.* Leiden: Brill, 2013.
- Zolotas X. *The energy problem in Greece*. Papers and Lectures 28. Athens: Bank of Greece, 1975.