The Francis' Tree MAGAZINE

nr1 / 2020

The awareness of the consequences of our choices

– Jadwiga Emilewicz
Minister of Development

Diversity is not a problem

– Jan Grabkowski
Poznan Starost

Trees and forests - the richness in diversity

MAN - ECOLOGY - DEVELOPMENT

Contents:

The Francis' Tree Magazine

Editor: Zakłady Kórnickie Foundation, al.Flensa 2B, 62-035 Kórnik
Editor-in-Chief: Dariusz Grzybek, PhD
Contact: magazyn@drzewofranciszka.pl, tel.61 898 02 91
Title page: Assisi. Photo: Tomasz Mączkowski

The sources and authors of photos:
Ministry of Development (4), Poviat Starosty in Poznań (15),
Joanna Wolińska (11, 22, 43, 46, 58, 60, 61, 65, 76), Jagrol company (25, 26),
Krzysztof Mączkowski (6, 28, 30, 33, 38, 39)

From the Editor

It seems no challenge nowadays to make a magazine that will present the opinions of people dealing with environmental protection. The topic is popular among children, teenagers and adults. A lot of statements and declarations related to it appear every day. We all discuss climate change and the reflections made about it.

We can say that there is a growing generation of experts in front of our eyes who want to win the argument at all costs. Still, we breathe the same air.
We do not aband on technological achievements. We use computers, home food processors and washing machines. The freedom rooted in our existence makes us move: by plane, by car, by train, or by bike.
These products and activities are energy-intensive. Sometimes, we realise it, but sometimes we only notice the smoke from our neighbours' chimney and, with a sense of superiority, condemn them to environmental damnation.
Building ecological awareness is a real challenge, but if we could expand it by adding spirituality based on Christian values, it becomes ..."a rollercoaster with no servicing". This is a really ambitious task.

We invite believers and non-believers to cooperate with us. For believers, it is a proposal to set out on a route from the tree of Eden to the living tree of the Cross, it is a journey with Christ in constant contemplation of the work of Creation.
For non-believers who are interested in ecology, it is a space for the development of spirituality based on objective beauty, harmony and willingness to act for the common good, with a sense of responsibility for future generations.

Man is part of the Creation, but a part which is not accidental. We will try to reinforce this idea with the reports of scientists and practical examples of actions. We will meet every six months on the pages of The Francis' Tree Magazine.
If it turns out that the need for expressing ideas is greater than this, we will change the format into a quarterly.
Happy reading!

Dariusz Grzybek, PhD
Editor-in-chief

The awareness of the consequences of our choices

The sphere in which we still have a lot of catching up to do is the awareness of the consequences of our choices - Dariusz Grzybek and Krzysztof Mączkowski talk to Jadwiga Emilewicz, Minister of Development

Dariusz Grzybek, Krzysztof Mączkowski:

You were the Minister of Technology and Entrepreneurship, now you are the Minister of Development, but you are also interested in the issues of environmental protection and sustainable development of the energy sector, which confirms the interdisciplinary nature of contemporary ecology. What issues do you pay attention to and why?
Jadwiga Emilewicz: In ecology, as in any other field of state activity, man is the most important. For me, personally, the determinant here is the papal encyclicals. In 1 991, John Paul II, in the encyclical *Centissimus Annus*, spoke of the integral protection of the environment, at the centre of which is human dignity. In turn, in 2015 *in Laudato si-'*, Pope Francis strongly emphasises that concern for the natural environment is not just action for the sake of action, but has a clear goal - improving the fate of the poorest.

Environmental protection has not only a natural dimension, e.g. biodiversity protection, but also a technological one. How does the technological dimension support ecology from the perspective of your ministry?
Technology serves an ancillary function in our lives. It also plays the same role in ecology. It is thanks to technological development and increasingly advanced inventions that we are able to emit less pollutants into the atmosphere, use the available traditional energy sources more effectively, or reduce the costs of green energy for the state, which will become increasingly important in the coming years.

Until recently, industry, or more broadly, entrepreneurship was considered harmful to the environment. Today this perspective has radically changed in favour of industry. What does the pro-ecological nature of Polish entrepreneurship depend on?
Entrepreneurs, regardless of whether they are micro, small, medium or large, are becoming more and more aware that the activities of their companies leave a permanent mark on the natural environment. Our government wants to perpetuate this change in awareness and translate it into practice. This is the direction of the Energia Plus programme which I proposed - the first prosumer programme in Poland, which will allow small and medium-sized enterprises to gain access to cheap and reliable energy produced by their own installations.

Could you please explain the principles of this programme?
The assumption of the programme is simple - we want to increase the number of prosumers, that is people, companies and institutions who are both producers and consumers of energy. At the end of 2019, the number of prosumers in Poland was estimated at approximately 100,000. We hope that thanks to the actions already taken, this number will increase rapidly. Since August 28, 2019, the so-called Prosumer Package has been in force. It is a regulatory element of the Energia Plus programme, which allows entrepreneurs to reduce energy costs. And thanks to the Energia Plus programme, the negative impact of enterprises on the environment will be reduced. The

air quality will be improved,among other things, thanks to support for investments limiting the emission of pollutants, reducing energy and heat consumption or using energy from renewable sources.

One of the most important civilisation challenges in Poland is energy security. Today, the sector is "based" on coal and to a very small extent on renewable energy sources. What are your predictions for the future?

It's hard to talk about predictions here. Let's take a look at the facts. We are observing a global trend of coal production decline among the ten largest producers (Poland is one of them). Coal production increased only in the Gulf region. In 2016, total global coal consumption in the energy sector decreased by 1.9%, because OECD consumption decreased by 5.3%. According to the International Energy Agency, expenditure on low-emission energy technologies in the countries associated within the Agency increased significantly in 2017 and amounted to USD 17.3 billion. At the same time, in the EU, we have clearly defined goals for the climate and energy policy until 2030. They condition our activities in the field of reducing greenhouse gas emissions, improving the energy efficiency of the economy and increasing the share of renewable energy sources in Poland's energy mix.

Coal-based energy engineering includes mining and hard coal energy, but also mining and power generation based on clearly harmful lignite. In Wielkopolska and other regions "blessed" with an abundance of lignite, this problem is particularly acute. Do you, as Minister, imagine a peculiar sort of consensus consisting in the complete abandonment of lignite? Wouldn't that soothe the Polish "coal debate"?

The goal of our energy policy is energy security, while ensuring the competitiveness of the economy, energy efficiency and reducing the impact of the energy sector on the environment. And we must remember that in Poland coal constitutes approximately 80% of the energy mix. Therefore, I believe that we need to act on several levels. On the one hand, we need clean energy and, on the other hand, more efficient technologies that involve not only the use of coal, but also its sustainable extraction. This applies, for example, to the consumption of water and energy during mining. We should work more and more intensively on such solutions.

In the context of the development of modern power generation, there is a discussion in Poland about the sense of the development of nuclear energy. Some point out that the atom could replace coal, others call for the application of newer and safer technologies than the atom. Wielkopolska is looking into the possibilities of using hydrogen. What are your expectations with regard to modern power generation?

Hydrogen is one of the most promising alternative fuels. For at least 30 years, there have been attempts to hydrogenate the economy, that is, to introduce hydrogen as a fuel that could be competitive with fossil fuels. In the Ministry of Entrepreneurship and Technology, starting from April 1, 2019, together with the Polish Economic Institute, the Institute of Industrial Chemistry and the Motor Transport Institute, we have been implementing a project entitled "Strategy for the development of the economy in the field of hydrogen technologies". Its purpose is to develop the assumptions of the state's economic policy in the field of the recommended systemic support for the development of the hydrogen economy in Poland, with particular emphasis on electromobility.

Transmission losses and waste of energy by consumers are a serious problem in the energy sector. According to some calculations, as much as 40 percent of energy is wasted. Is there any way to counteract this?

At the lowest level. The report of the Institute for Structural Research shows that 12.2% of Poland's population, i.e. 4.6 million people, which is approximately 1.3 million households, live in energy poverty. As a result, these people have no chance of gathering material resources to protect their homes from wasting energy. Our answer to this problem is the "STOP SMOG" programme, which co-finances the thermal modernisation of single-family houses.

The Francis' Tree programme is a programme developing, among other things, the spiritual side of sensitivity to environmental issues. Contrary to appearances, this is an extremely important area of shaping proper pro-ecological attitudes. In what sphere do you see the sense of secular pro-ecological activity?

One such sphere in which we still have a lot of catching up to do is the awareness of the consequences of our choices. Anyone who puts low-quality coal into the furnace or burns rubbish in it should simply think

that their children or grandchildren will breathe this air later. After all, nobody in his right mind forces a child to smoke a dozen or so cigarettes a day, and this is exactly what a person burning in a home stove everything they can get their hands on does. This is an area where institutions and authority figures in local communities should continuously raise people's awareness of the consequences.

The government you represent announced cooperation programmes with non-governmental organisations and established the National Freedom Institute working on the practical aspects of this cooperation. However, this cooperation still seems underdeveloped. Is there a simple recipe for improving these relationships?

The programme of cooperation between the government and non-governmental organisations has been prepared over many years and is one of the important indicators of good practices in cooperation between public administration and non-governmental organisations. The National Freedom Institute is a government agency that implements the assumptions of the programme, such as supporting civil society, public benefit activities and volunteering. One of the most important tasks performed by the NFI, and appreciated by all social organisations, is the allocation of funds for institutional support. Thanks to it, non-governmental organisations in Poland can professionalise their activities and thus build a strong civil society.

Thank you for your time, and for talking to us. ■

TREES AND FORESTS – RICHNESS IN DIVERSITY

Andrzej M. Jagodziński

The loss of forests and woodlands entails the loss of species which may constitute extremely important resources in the future, not only for food but also for curing disease and other uses (...) Each year sees the disappearance of thousands of plant and animal species which we will never know, which our children will never see, because they have been lost for ever (...) It may well disturb us to learn of the extinction of mammals or birds, since they are more visible. But the good functioning of ecosystems also requires fungi, algae, worms, insects, reptiles and an innumerable variety of microorganisms. Some less numerous species, although generally unseen, nonetheless play a critical role in maintaining the equilibrium of a particular place (...) Greater investment needs to be made in research aimed at understanding more fully the functioning of ecosystems and adequately analysing the different variables associated with any significant modification of the environment. Because all creatures are connected, each must be cherished with love and respect, for all of us as living creatures are dependent on one another.

The Holy Father Francis, Encyclical Letter Laudato si', On Care for Our Common Home, Libreria Editrice Vaticana, Vatican, 2015

Knowledge about the world around us seems to be meticulously structured and widely available today, which is a derivative of our civilisational development. If one wants to learn something, fill a gap in one's knowledge, one just looks on the Internet and in a few moments finds an answer to the question. Libraries are also at hand, too, and we can look at books or magazines, or ask our relatives or friends - parents, brothers - and if they have such knowledge, they will certainly share it with us.

In order for us to know more, we must - firstly - be eager to do it, and - secondly - use a reliable source of knowledge. And, undisputedly, we systematically add new bricks to the resources of knowledge we have today. Hence, gaining knowledge is a process that, as a rule, has no limits. And the more a person knows, the more they see. So, let's agree that we want to see more, which means we need to know more; this time, about the trees and their diversity.

We will start our journey with a walk in the garden of Theophrastus of Eresos, a Greek scholar and philosopher who lived in the years 370-287 BC. Theophrastus, a student of the great Aristotle, was a philosopher of nature and left behind an enormous scientific output, including botany, as he dealt with systematics, morphology, geography, ecology, and plant physiology. His work is difficult to overestimate, hence his successors gave him the name of the "Father of Botany". And it was he who, guided by the need to organise the world of plants, introduced the first division of the plant world, assigning the plants in his garden into the woody and herbaceous groups.

We will devote our time to the former. Woody plants, despite numerous similarities, form an internally heterogeneous group. What they have in common is that they are perennial plants with woody stems (the aboveground, axial part of the plant, which together with the leaves, buds, flowers and fruit placed on it, forms a shoot), and also woody roots.

Woody plants include trees, shrubs, prostrate shrubs, semi-shrubs, and climbers; this division is conventional as indirect forms are also known in nature. Woody plants are the subject of dendrological studies, which are a branch of botany or plant science.

Trees are long-lived plants, sometimes growing to great heights, characterised by a woody main shoot (or sometimes several) which we call the trunk, and by the production of branches (side shoots) that form a characteristic crown. Thick branches are called the limbs. Sometimes, judging by the characteristic habit, including the crown appearance, we can assign free-standing trees from a distance to a specific species without much difficulty.

Generally speaking, trees are divided into two groups - coniferous (belonging to gymnosperms) and deciduous (belonging to angiosperms). Still, there are cases that are not easily classified. We can assign the Scots pine, Norway spruce or European larch to conifers without hesitation, as well as the common beech, black alder or small-leaved lime to deciduous trees. However, ginkgo biloba looks more like a deciduous tree, but belongs to the gymnosperms.

In trees, on the cross-section of their trunk, we can usually see distinct annual growth rings used to determine the tree's age. This is possible because each year during the growing season the tree deposits its growth as a ring. The rings are the result of secondary growth and consist of early wood (produced in the spring in our climate zone) and late wood (produced in the summer). Depending on the species, the boundaries between early and late wood are more or less visible to the naked eye. In most conifers, and a large proportion of deciduous trees with ring porous wood, these boundaries are visible to the naked eye, while in most diffuse porous wood species these differences are invisible or hardly noticeable (only with a microscope).

The width of annual rings is related to the habitat conditions of tree growth, i.e. soil moisture and fertility, the amount and timing of precipitation as well as random factors, such as droughts, floods, fires, and insects gradient outbreaks. The more favourable the growing conditions, the wider the annual radial growths of trees.

Typical deciduous trees growing in our country are oaks (pedunculate, sessile and downy), common beech, birch (warty and downy), common ash, black alder, poplars (black, white and aspen), maples (common, sycamore and Norway), limes (small-leaved and broad-leaved), willows and elms (pedunculate, mountain and common). The species of conifers that occur naturally in Poland include, among others, Scots pine, Norway spruce, Norway fir, European larch and common yew.

Similarly to trees, shrubs are perennial plants with a woody stem. However, it most often branches at the base of the aboveground part, forming many woody stems of equal character. In this group, it is generally impossible to establish a main trunk or a crown, characteristic of trees. Shrubs grow up to several meters in height. Of course, there are also tree-like forms among shrubs, showing a characteristic single trunk and a small crown, but they are relatively rare. Common shrubs in our forests include, among others, hawthorn, rose, lilac, mountain ash, juniper, viburnum, blackthorn, hazel, dogwood, bird cherry, euonymus or buckthorn.

Prostrate shrubs generally do not exceed 50 cm in height, and are often creeping or groundcover plants, e.g. bilberry and cowberry, heather, common periwinkle, or bearberry. Half-shrubs represent transitional plants between shrubs and herbaceous plants, because only the lower part of their aboveground shoot is woody (cf. sweet mountain nightshade). Climbers, on the other hand, are characterised by a slender and long stem requiring a support, e.g. on a tree, in order to climb on it and benefit from the sun's rays (this group includes e.g. honeysuckle, common ivy or Virginia creeper).

Yet, the above list of woody plant groups does not show their full diversity. The richness of morphology of their leaves, flowers and fruits, including their shapes and colours, can far exceed our imagination. Take leaves as an example. Most of them consist of a blade and a petiole. The leaves directly attached to the stem are called sessile, and those with a petiole are called stalked. Leaves can be made up of a single blade (we then call them single or simple) or of many blades (compound leaves) set on a common axis. Maples, oaks, limes, hornbeams, elms, buckthorns, hawthorns, buckthorns and viburnum are examples of simple-leaved woody plants, while common ash, black locust, horse chestnut, rowan, or European bladdernut have compound leaves (many leaflets or blades).

Woody plants show a surprisingly rich variety of leaf blade shapes (e.g. acicular, linear, deltoid, cuneate, ovate, elliptical, obtuse, diamond-shaped, cordate, etc.), of their bases (e.g. cordate, reniform, orbicular), apices (e.g. pointed, cleft, truncate, obtuse) and blade margins (e.g.

entire, undulate, undulate, crenate, serrated dentate, serrated, doubly serrated, etc.). Leaf blades can also have various indentations, and, depending on the depth of these indentations, leaves are divided into lobed, cleft, and parted, while depending on the arrangement of these indentations - palmate or pinnate.

Each species also has a characteristic foliage pattern (phylotaxis), which means the arrangement of leaves growing from the so-called nodes on the stem. Comparably great diversity is visible in other organs of woody plants, and all these features are of significant importance in recognising tree species, in distinguishing one from another. Moreover, all of these tree components play specific roles, ensuring the proper development and existence of the species. This variability is worth our attention, for example during a walk in a forest, in a park or in an arboretum, which is a place where various species of woody plants, sometimes replanted from very distant places, are gathered into collections.

Trees form characteristic communities which, in their most perfect form, make forests. Forests, although now largely artificially transformed in most regions of the world, play an extremely important role in maintaining the ecological balance of the environment. They are the most complex ecological systems of all terrestrial ecosystems and constitute an extremely important part of the biosphere. These systems are higly dynamic, change across time and space, yet are still very stable. Although it is hard to valuate individual components of forests, trees undoubtedly play the most important role in them as they determine the characteristic physiognomy of this ecosystem.

The definitions of “a forest” vary, including those suggested by the broadly understood natural sciences. One of the most complete was formulated by Professor Jan Jerzy Karpiński, an outstanding Polish naturalist, who described a forest as “a dynamic creation of nature which integrates the following elements into an indivisible whole by a system of dependencies, relationships and mutual influences: specific vegetation with predominant part taken by woody forms, animals related to it, and geological base, soil, water and climate which plants and animals are dependent on”. Although this definition does not include all the components of the forest, e.g. mushrooms, still the crucial thing in it is to treat forests as a dynamic creation, i.e. something that is subject to constant change, due to both internal and external factors. And that its components show mutual dependance and are related by more or less visible relationships.

Forests perform a number of functions that we conventionally divide into ecological, social and economic.

Ecological functions, also known as protective, include environmental stabilisation. Forests regulate natural hydrography (they are also a huge reservoir of water themselves), global climate and microclimate, are an important soil-forming factor and prevent soil erosion, help obtain better results for agriculture (e.g. by buffer strips). Moreover, forests protect against the negative effects of industry (dust and gas pollution, noise) as well as against natural disasters (e.g. hurricanes, floods, avalanches). In recent years, however, also in Poland, forests can become their own victims. Forests are important reservoirs of carbon, which is stored in both biomass and soil.

What is more, they provide biological diversity, considered at all of its levels (diversity of genetics, ecosystems, and species). Of course, the economic value of forests is calculated in terms of wood. Other goods forests provide include wild mushrooms, forest fruits, herbs used in medicine and pharmacy, and game meat. These goods impact the development of many industries of fundamental importance for the national economy.

Forests (or rather forested land) constitute a significant component of national wealth, and forest management provides serious resources to the national income. Forests have a beneficial effect on the mental and physical health of humans, serve as recreation and relaxation areas, exert an inspiring influence on artists and ensure the development of culture (this is the so-called cultural role of the forest), strengthen a country’s defensce and acts as a workplace.

Where forest functions are concerned, the ecosystemic “services” they provide are worth noticing. They are understood as the contribution of ecosystems (forests in this case) to human well-being, and treated as an income obtained from such natural capital. In other words, the “income” is the total gains we get from the environment (treated as a natural asset).

Ecosystem “services” are therefore closely related to the quality of human life. Scientists classify these services into various categories, such as habitat services (primary), provisioning, regulatory and cultural services. In a situation where man damages the environment, they damage nature’s potential to provide ecosystem services. This concept shows the links between two crucial fields of modern knowledge - ecology and economics.

Our attitude to forests can be treated as a measure of humanity. In 1990, the global area of forests amounted to 4.128 billion hectares, while in 2015 it fell to 3.999 billion hectares, i.e. by an average of 0.13% per year in the analysed period. This means that the forested area in these 25 years decreased from 31.6% to 30.6% of the Earth’s lands. Such character of changes brings about dramatic consequences. However, deforestation (or forest loss) is not evenly distributed across our globe.

The greatest deforestation occurs in the tropics and subtropics, especially in South America and Africa, although the rate of forest loss in these regions has decreased in recent years. Data analysis for 234 countries, carried out in 2016 by FAO (Food and Agriculture Organisation of the United Nations), showed that the forest area in Africa is 624 million ha (0.49% average annual loss), in Asia 593 million ha (an increase by 0.17%), in Europe 1015 million ha (an increase of 0.08%), in North and Central America 751 million ha (a decrease of 0.01%), in Australia and Oceania 174 million ha (a decrease of 0.08%), in South America 842 million ha (a decrease of 0.40%).

Despite the various trends (decrease or increase in total forest area) on each of the continents, the most disturbing is the loss of 6.5% of natural, or close to natural forests from the entire globe in the analysed 25 years. These changes apply to basically all continents, except Eurasia.

On each continent, however, more and more tree plantations arise, although generally at a rate that does not compensate for the loss of natural and close to natural forests. The highest rate of deforestation was recorded in Nigeria, Zimbabwe, Paraguay, Myanmar (Burma), Argentina, Tanzania and Indonesia.

This comparison shows that Europe is - in general - doing well when it comes to its attitude to forests. What is the position of Poland’s forests? According to the Polish Central Statistical Office (Główny Urząd Statystyczny) forests covered 9.255 million ha as of 2018, while forest land was 9.460 million ha. At the end of the 18th century, forests covered about 40% of the Polish territory (in its borders of that time), in 1946 they only accounted for 20.8%. Since the end of World War II, thanks to forest administration, the area of forests in Poland has been systematically increasing and today forests of various ownerships cover approx. 29.6% of our country.

This means that, on average, 0.241 ha of forest falls to each inhabitant of Poland. Our country takes seventh position among 28 European Union countries in terms of forest area under all ownership. Among all forests in Poland, lowland forests have the largest share (7.832 million ha; 85% of the forest area). Of course, forests are not evenly distributed in Poland - the largest forest cover is found in the Lubuskie (49.3%), Podkarpackie (38.3%) and Pomorskie (36.4%) regions, while the lowest in the Łódzkie (21.5%) Mazowieckie (23.4%), Lubelskie (23.4%) and Kujawsko-Pomorskie (23.5%) regions. Forests occur mainly in the poorest soils (more fertile land is cultivated as arable land), and the land availability and quality largely determines the structure of species growing in the Polish forests.

Conifers currently cover approx. 68.4% of our forest area, with Scots pine 58.2%, Norway spruce 5.8% and Norway fir 3.2%. Among deciduous trees, oaks (7.7%), birches (7.3%), beeches (6.0%) and alders (5.7%) cover the largest area. However, if we look at our resources in terms of

the amount of wood (i.e. the amount of cubic meters of merchantable timber, that is roundwood with a diameter of at least 7 cm with the bark at the upper end), pine accounts for 61.2% of these resources, spruce 5.7%, fir 4.2%, beech 6.8%, oak 6.5%, alder 5.3%, and birch 4.8%. Timber resources of the growing stock in 1945 amounted to 906 million cubic meters (m3), while currently it is 2.62 billion m3 of merchantable timber, including 2.05 billion m3 in stately owned forests, 70 million m3 in national parks, and 444 million m3 in private forests.

The average age of forest stands in Poland is 58 years. In the forests managed by the State Forests Administration it amounts to 60 years, and in private forests to 50 years. Such a significant increase in standing wood resources (in the forest) in the post-war times should be credited to several generations of forest rangers and the implementation of sustainable forest management.

Pursuant to the Act of September 28, 1991 on forests, permanently sustainable forest management is an activity aimed at shaping the structure of forests and their use in a manner and at a pace ensuring permanent preservation of their biological richness, high productivity and regenerative potential, viability and fulfilling, now and in future, all important protective, economic and social functions at local, national and global levels, without harming other ecosystems (Journal of Laws of 1991 No. 101, item 444, as amended).

It needs to be repeated - to disprove the astonishingly numerous statements in various media claiming the opposite - that the forest area in Poland has been constantly increasing since World War II. In 2018, Poland introduced forest renewal (planting trees in areas where mature stands have been cut down) and afforestation (planting trees on non-forest land, e.g. on agricultural land no longer suitable to be used for production) on a total area of 56.1 00 ha. Afforestation covered 1.321 ha of land. In 1945-2018, 1.5 million ha of land was afforested, hence a significant increase in Poland's forest cover.

What is worrying, however, is the significant drop in the number of trees planted away from

forests (woodlots, for which forest rangers are not responsible). In 2018 only 568 000 trees were planted in Poland, while in 2017 it was 1.17 million, in 2015 1.47 million, and in 2010 - 2.09 million trees. Still, obtaining merchantable timber from these woodlots has remained at a similar level over the last 10 years. This data clearly shows how much we underestimate the environmental role of woodlots, whose condition is gradually and systemically deteriorating.

Woodlots play a number of protective roles: climatogenic (act as windbreaks, limit evaporation, modify the distribution of precipitation, affect the temperature of soil and air), soil protective (act against soil water and wind erosion), water protective (reduce surface runoff, limit water pollution by filtering it, slow down snow melting), biocenotic (provide habitat for numerous species of plants, animals and fungi), sanitary and hygienic (retain toxic gases and dust) as well as mechanical (build property boundaries, strengthen slopes), and so on.

In addition, woodlots produce timber and other non-timber products such as pharmacological components, edible fruits, bee products, as well as performing socio-cultural functions. It is often the case that even small tree stands are home to rare species of plants, animals and fungi. Tree buffer strips provide ecological corridors connecting forests that are distant from each other. This is of particular importance when forest ecosystems are significantly fragmented, which is also the case in our country.

The productive function of trees and forests is illustrated by numbers. The amount of wood obtained in Poland is permanently growing. In 2018, it was 43.93 million m3 of merchantable timber harvested from forests of various ownership, 38.33 million m3 in 2015 and 33.57 million m3 in 2010, and so the increase in 2010-2018 was 30.9 %. In 2018, in State Forests alone, 41.63 million m3 timber was harvested-, while 36.50 million m3 in 2015, and 31.88 million m3 in 2010. This is an increase of 30.6%.

The growth in the volume of collected timber consisting of deadwood, scrap and windfall in the State Forests is worrying - it accounted for 11.78 million m3 in 2018, whereas it was 5.10 million m3 and 5.69 million m3 in 2015 and 2010, respectively. This data suggests the deteriorating health of tree stands (mainly composed of spruce and pine) and its consequences. More and more intense tree death is observed in various parts of Poland.

But, of course, a forest does not mean only wood. In Poland, wild mushrooms are massively collected there. In 2010 4.500 tonnes of fresh mushrooms were purchased in 2010 from

individual gatherers, 7,3000 tonnes (incl. 2.9 -000 tonnes of chanterelles, 3,4000 tonnes of bay boletes and 864 tonnes of king boletes) in 2017, while in 2018 3,300 tonnes altogether (with 908 tonnes of chanterelles, 2,060 tonnes of bay boletes, 248 tonnes of king boletes).

In 2018, forest fruit purchasing centres purchased 3,2-000 tonnes of blueberries, 782 tonnes of elderberries, 293 tonnes of rosehips and 9 tonnes of rowan berries from individual gatherers. This clearly confirms that for many people the income from wild fruit gathering constitutes a significant part of household budgets.

Bearing in mind the above, it is not surprising that forests are the object of public concern. A significant part of forest areas in Poland is protected by law. Areas of special natural values in our country protected by law cover approx. 32.6% of the area, including 23 national parks (1.0%), 1,501 nature reserves (0.5%), 123 landscape parks (8.1%), 386 protected areas (22.4%), 8206 ecological sites (0.2%) and 331 nature and landscape zones (0.4%).

Moreover, protection of nature is presented - to the public according to the Polish Nature Protection Act of 2004 - in 182 documentary sites (including geological formations, fossil accumulation areas, caves, mud accumulation sites, underground workings, etc) and 35,020 monuments of nature. National parks now occupy a total of 315,-000 ha, while nature reserves 170 thousand ha. In Poland (apart from the sea), over 4.9 million ha of Special Protection Areas and 3.5 million ha of Special Areas of Conservation as Natura 2000 areas were designated. Over 42% of Polish forests are so-called protection forests: soil-protective, water-protective, spa resorts forests, forests damaged by industry, military area forests (military training grounds), animal sanctuaries, research forests, suburban forests, seed-supplying forests, and those considered of greater natural value.

Considering the numerous functions of forests, already briefly discussed here, one must also bear in mind their key importance for the protection of biodiversity. We understand biological diversity (also biodiversity) as the richness and variability of life on the Earth. It is a very broad definition, but it fully reflects the term meaning. So let's have a look at our forests past and present, and their (and our) future.

In the report by the European Environment Agency called "European forest ecosystems. State and trends" published in 2016, the current distribution of forests in Europe - together with their species composition - was described as a result of forest management rather than natural powers. It is not surprising, as man has intensively used forests, not only wood, since ancient times, significantly transforming them contemporaneously.

Despite reducing the total forest area (compared to the Middle Ages) to a dangerously small size, and especially during the industrial revolution, forests are still the dominant type of land cover in Europe today, covering approx. 43% of the land.

A growth has been noted in the forested area in Europe. This results not only from planned actions (afforestation of land unsuitable for agricultural production or other wastelands), but also from natural processes such as succession, i.e. the entry of trees to undeveloped land. These forests are a reservoir of biodiversity.

The geographical location of Poland in a zone of mixed forests has promoted the development of vast primeval forests, wetlands and marshes in the past. Here, maritime and continental climates meet, and this, to a large extent, forms habitat characteristics. This is a specific climate and soil, together with a geographic and topographic location that determines the habitat character.

The current state of biodiversity in Poland is also due to the lack of natural barriers in the east and west of the country, as well as geological structure and topography. Less intensified agriculture and slow and delayed industrial progress comparing to Western Europe have contributed substantially, too.

Despite hundreds of years of research documenting biological diversity in Poland (done with varying intensity and accuracy), it still hides many secrets. Diversity manifests itself on many levels, basically from the molecular level to the ecosystemic. In general, we understand it as the number of species in a given area (so-called species richness),

although such an approach significantly narrows the meaning of the term in question.

Interestingly, despite many years of botanists', mycologists' and zoologists' efforts, we still do not have a complete list of species living, not only in Poland, but in the entire Earth, with scientists constantly discovering new species. So, how can we understand an ecological system's functioning, let's take a forest as an example, if we do not yet have a complete, fundamental knowledge of its species composition, of the organisms inhabiting the area, individual species' biology and the interactions between them?

Forest ecosystems are home to numerous species of fungi, plants, animals and other organisms. Many of them are exclusive to forests and absent from other ecological systems, like meadows or fields. From among the so far registered ca. 60,000 species in Poland, forest species contain ca. 30% of vascular plants, ca. 60% of terrestrial vertebrates, and ca. 80% of macrofungi and 55% of invertebrate species. Thus, our forests, covering 1/3 of the entire country, may be inhabited by 60–65% of species of all systematic groups specific to Poland.

Referring to Prof. Karpiński's definition of the forest, these species, together with inanimate components of forest ecosystems, constitute an indivisible whole, a complex system of dependencies, connections and mutual influences. The real wealth of our forests is determined by their species and communities of which they are components (i.e. phytocoenoses, mycocenoses, zoocenoses, biocenoses and ecosystems), as well as their dependencies, connections and relationships.

In Poland, there are dozens of forest plant communities, sometimes showing great dissimilarity. Let us compare oak, beech, birch, pine and spruce forests: their species composition varies, not only when it comes to trees. Original soil conditions and the surrounding environment can be modified by the trees themselves, e.g. by regulating the access of sun rays to the forest floor (undergrowth) or by the chemistry of the dead organic matter falling there (forming the litter).

Research conducted at the Institute of Dendrology of the Polish Academy of Sciences in 30-40-year-old individual single-species stands of 14 different tree species (planted in an initially homogeneous habitat after a pine stand that had been cut down) reveals that the decision concerning trees to be introduced into forest cultivation brings long-term effects. Trees modify the habitat, each species in its own specific way, which leads to forming clearly differentiated communities of plants, animals and fungi.

Species richness and biodiversity are linked to a habitat characteristics. Take the example of Poland - in average patches of vegetation in pine forests on the forest floor we can find about 20 species of vascular plants, mosses and terrestrial (epigeic) lichens, and about 30-50 in oak-hornbeam forests and riparian forests (i.e. fertile deciduous forests), while in luminous oak and alder forests about 50-60 species or even more.

The currently observed climate changes, in particular global warming and the more and more frequent long-term droughts, will wield an impact on trees and entire forest ecosystems. These change scenarios very often concern the changes in the geographical range of trees. It is expected that in the next 50 years in Poland those species that today make up ¾ of our forests (Scots pine, Norway spruce, silver birch and European larch) will lose their climatic optimum. Reducing the acreage of these species will bring about changes in the living conditions of other plants, animals and fungi, which often accompany a specific tree.

We can therefore expect visible changes in our forests' biodiversity. A substantial question remains whether or not native tree species will be able to adapt to these changes and to what extent. This is a key issue, not only for scientists who study the responses of forest ecosystems to global changes, but also an important challenge for practitioners so that they can ensure the durability and stability of forest ecosystems. Expanding our knowledge of the biology and ecology of woody plants and the ecological systems they make is the foundation on which all decisions regarding the future of our forests should be based. ■

Diversity is not a problem

Krzysztof Mączkowski talks to Jan Grabkowski, Poznan Starost, Vice-president of the Poznan Metropolis Association (Stowarzyszenie Metropolia Poznań).

Krzysztof Mączkowski: The local government reform restored counties (powiaty) in Poland in 1999. Twenty years have passed since their re-establishment. The discussion about the validity of their work has actually been continuing since the very beginning. How do you assess the competence of counties in the field of environmental protection?

Jan Grabkowski: In this case, we focus primarily on regulatory activities. We publish, among other things, permits for the emission of dust and gases from the installations operated, for waste generation, collection or processing. We issue permits for the removal of trees and shrubs in areas belonging to municipalities, we grant licenses for the extraction of minerals and we approve geological, hydrogeological, geological and engineering documentation. We also deal with preparing certificates, for example, whether there is a forest on a given plot. It is used in the real estate pre-emption procedure by the State Forests. In addition, the County Council in Poznan, in the environmental protection program for Poznan county adopted in 2016, set such goals as air quality protection, water and land protection, proper waste management, reduction of acoustic environmental hazards, prevention of excessive emission of electromagnetic fields, nature protection, environmental education or promotion of the natural and tourist values of the region. We continuously keep these goals in mind while conducting administrative proceedings, but also implementing county projects.

What is missing in these competences? Plenty of them are now in the hands of the government administration. Which of them would be worth transferring to the county level?

We lack competences in the field of water management. From January 1, 2018, they fall within the competence of the "Polish Waters" National Water Holding (Państwowe Gospodarstwo Wodne "Wody Polskie"), i.e. the Director of the Regional Water Management Board and the director of the River Basin Board.

You are the first county in Poland to become involved in modelling water management in the context of flood risks. What does that involve?

In 2010, the "County Operational Plan of Flood Control for the County of Poznan" was created, which was then updated with the document "Flood control plan update for Poznan County". One of its most important elements are flood hazard maps covering the most important parts of the hydrographic network of the Warta river area. They were developed based on the experience of the 2010 floods.

Has the programme been completed?

According to the regulations, flood risk management and protection against floods is the task of, among others, county government. That is why we are constantly involved in these issues.

Referring to your many years of experience in local government work, I would like to ask

you about the environmental problems that are most critical for local governments.
An important point is poor water management. The main threats are caused by insufficient retention of rainwater, liquidation or devastation of drainage facilities, or their insufficient maintenance. The lack of infrastructure draining rainwater from built-up areas and water retention makes it impossible to use to maintain greenery or, for example, to sprinkle roads to reduce dust.

On the other hand, planning errors and mixing of acoustically protected areas with industrial and service areas result in noise in protected areas and cause social conflicts.

Atmospheric air quality is another major concern. Its poor condition is mainly caused by substances from domestic stoves and local coal-fired boiler houses, and - to a lesser extent - by means of transport. In the facilities managed by the county authorities, thermal modernisation has been carried out, heating and lighting devices have been replaced. Where possible, installations using renewable energy sources were used. For two years, we have also been running a programme of financing the liquidation of low emission sources and replacing them with pro-ecological solutions.

Another problem is the risk of environmental pollution and the possibility of extensive damage caused by poor waste management. The work of entrepreneurs who reliably recover, neutralise and collect waste is obscured by ever new cases of criminal disposal of waste in places that are not intended for it. Legal regulations concerning waste have been amended for a year now, to define additional requirements for the storage, collection and processing of such materials. Legal regulations are very burdensome for those operating in this industry. The inspection powers for environmental protection inspections have also been increased. The future will show whether this will actually contribute to increasing ecological safety and whether it will significantly reduce illegal activities.

The County of Poznan is the largest land county in Poland. In addition, it is specific, because it is in the form of a bagel surrounding Poznań. It is made up of seventeen communities (gminy). Each of them has their own environmental specificity. How do you handle such diversity?
We actively cooperate with all the communities. Diversity is not a problem, and it often provides an opportunity to look at a particular issue from a different perspective. And this is an asset. It gives strength to local governments. An example might be a competition for external financing for joint action on asbestos elimination in our county.

Poznan County was the first in Poland to implement an asbestos removal programme and is still taking the lead in it. The strategy that was created in 2006, and was considered innovative for that time, is still effective today. What is the cause of this success?
Co-financing the disassembly, transport and disposal of asbestos-containing products covers 100% of the total costs. The financial aid is available mainly to individuals owning real estate in Poznan county. The owner of the building bears only the costs of the new roof covering. Thanks to the cooperation with communities, people interested in receiving a grant submit an application close to their place of residence - at the community office.

What is the ecological effect of this project?
Under the programme, 10.502 tonnes of asbestos and derivative products were neutralised in the county in the years 2006-2018.

Are you going to continue this programme?
Definitely yes. The programme will be continued throughout 2020.

The location imposes on the county a necessity to cooperate with the city of Poznan. How has the cooperation on environmental issues been developing?
The cooperation is quite good. We actively participate in conferences in the field of environmental protection organised in the city office (starosty), we exchange experiences and consult each other, for example, on combating low emissions. We have a representative in the Municipal Team for Air Quality in the area of the city of Poznan.

You were one of the co-founders of the Poznan Metropolis Association. Can you explain its idea to readers from outside Wielkopolska (Greater Poland)?
It is an intermediary institution in spending EU money, e.g. as part of Integrated Territorial Investments. From the very beginning, we have been cooperating with Poznan's universities and we created the Metropolitan Research Centre. We demonstrate that we are able to communicate. We have a partner in the regional marshal and in the communities. Several years ago, many people asked loudly: what do you need the association for? Today they have the answer. Of course, this initiative needed time to convince so many partners and to dispel the doubts. For example, the Poznan Metropolitan Railway turned out to be a great success, we are also successfully resolving the problem of unplanned suburbanisation. Thanks to the Association, air quality sensors have been installed in 160 schools in the metropolis. All this helps to increase the quality of life and is also beneficial for the environment. And that is only a small fraction of our activities.

You are the vice-president of the Association of Polish Counties. What are the reasons for local governments to get involved so extensively?
First of all, supporting collective interests. As members of the Association, counties can shape a common policy, undertake development initiatives or introduce new solutions on a larger scale. This applies to many areas and brings tangible results. We are also present on the national forum.

We not only provide opinions, but also initiate the drafts of legal acts. On behalf of the Association, I am one of the representatives of the local governments in the Joint Commission of the Government and Local Governments. We act together because we want to have an influence on what concerns us. After all, it is local government that plays a key role in the functioning of the state and society. We provide the majority of public services for residents and it must be realised that what we work out together will affect the standard of living now and in the future.

The City Council of Poznan adopted the Climate Change Adaptation Plan six months ago. Isn't it worth thinking about extendingit to the entire Poznan agglomeration?
The Municipal Climate Change Adaptation Plan is a project of the Ministry of the Environment for cities with more than 100,000 inhabitants. Its main goal is to assess the sensitivity to climate change of the 44 largest cities in Poland, as well as to plan adaptation measures to counter the hazards identified. The development and adoption of the plan was preceded by the signing of an agreement between the Minister of Environment and the President of Poznan. The analysis of climate change issues and the possibilities of adapting to them may also be included in the environmental protection programme, which is a document adopted by the County Council in Poznan.

Poznan county cooperates with non-governmental organisations. How is this developing in the field of ecology?
Representatives of non-governmental organisations are involved in training courses for village leaders and uniformed services organised by the county. We are happy that they respond positively to our invitations and give free presentations on environmental topics.

From the very beginning, Poznan county has been supporting and patronising the Francis Tree Programme, for which we would like to thank you once again. What does the attractiveness of this programme consist in from your point of view?
The Francis Tree programme is aimed at primary school pupils. It is worth noting that the form of implementing the ideas evaluated in the competition was not imposed by the organiser. It is chosen by a given school team. The scope of the program, which this year embraced the Wielkopolskie Region, is also growing. Participation, and especially being awarded a distinction in the competition, gives both students and the school a lot of joy and satisfaction.

Thank you for your time. ■

Water problems in urbanised areas

Piotr Kowalczak

The author is in favour of the thesis about the cyclical natural variability of the climate, and not about the genesis of its anthropogenic changes promoted by the Intergovernmental Panel on Climate Change (IPCC). This approach is very important when analysing changes caused by urbanisation, where the effects of this process have been very effectively (in a negative sense), mistaken for those of climate change. It can only be hoped that this was done unintentionally.

Identification of the origins of climate variability is the basis for effective actions aimed at minimising the hazards caused by this process (urban floods, damage to the hydrographic network, seasonal deep water deficits), and above all, using the positive aspects of changes for economic activity and environmental needs (CO_2 growth favourable for plant development, extension of the growing season). Currently, in the process of urban development, the main thing that is observed is the lack of classical urban planning. Adoption of the IPCC theses in this case makes it impossible to effectively counteract the unfavourable effects of urbanisation processes, and the projects implemented on the basis of these ideas as part of the adaptation of urbanised areas to climate change are considered to be ineffective. Based on the example of Poznan, it can be indicated how far the current solutions differ from the studies of the outstanding Poznan city planner and architect Władysław Czarnecki.

In the period after 1800, there was a rapid increase in the world's population - from 900 million in the year 1800, through 1.65 billion in 1900, 3 billion in 1960, 4 billion in 1975, 5 billion in 1987, 6 billion in 1999, 7 billion in 2011 and 7.7 billion in 2019 [Roser M, Ritchie H. Ortiz-Ospina E. 2020]

The greatest increase in population was recorded in cities. This is best illustrated by the share of urban population in the total Earth' population. In 1800, only 3% of the world's population lived in cities, in 1900 almost 14%, but only 12 cities had 1 million inhabitants, in 1950, 30% of the world's population lived in cities, and there were 83 cities with a population of one million. Only one city had a population of over 10 million. In 2000, about 47% of the world's population lived in cities, 411 cities had more than 1 million inhabitants and 19 cities were inhabited by over 10 million people. In 2006, the world's urban population became equal to its rural population, which was accompanied by further development of cities. By 2050, more than two-thirds of the world's population (7 billion) are projected to be living in cities.

The concentration of the urban population is increasing - in 2018 the population of the largest metropolitan area in the world, Tokyo (38,305,000 inhabitants - as of April 2018), exceeded the population of Poland: 37.98 million (as of 2018).

The **rapid population growth in the world is accompanied by a rapid urbanisation process**, the unrestrained forms of which in developing countries are causing the accumulation of problems hitherto unknown in urban development. Also, cities in rich countries are not free of problems related to their development. The main problem is water supply to cities and the related problem of collecting and treating sewage and neutralising waste. Maintenance of the natural environment and combating water and air pollution are equally important [Kowalczak P. 2008].

The unusual concentration of city populations (almost 60% of the Earth's population on only 2.8% of the globe's land surface), results in an exceptional concentration of resource needs, including water, and problems with **environmental pollution** in these areas.

— *Historical background* —

Scientists and academics participating in conferences and meetings concerning water management in Poland - **very often criticise projects that in the past led to the dehydration of our country**. Particularly

criticised are the regulations of rivers and smaller watercourses carried out by the partitioning powers and occupants, followed by unilateral actions in the field of water drainage conducted in the post-war period. The areas of cities are the areas most transformed as a result of human economic activity. All elements of the natural environment have undergone transformation: waters, topography, soil, microclimate, vegetation and the animal world. The aquatic environment underwent particular change [Kowalczak P.2010].

The currently occurring and growing intensive process of urban drainage is being ignored, probably due to a lack of knowledge. Currently, the "water management" in many cities still consists in the fastest possible discharge of rainwater and incoming water from the city. This is done with the help of very expensive sewage systems, which, as practice shows, constitute an increasingly unreliable system of protection against flooding of cities and hydraulically very efficient relief channels. At the same time, cities, in order to remedy the short falls, bring in water using equally expensive installations, sometimes from long distances. **This is a great waste, a continuation of the country's dehydration, and the creation of hazards.** An equally bad **solution is to limit the role of a river flowing through the a city to hat of a flood canal.**

Dehydration of cities in Poland is increasing on a catastrophic scale. This can be illustrated with the data concerning Poznan. In the period 1945-2000, the share of rainwater discharged through the rainwater sewage system in Poznan increased from about 2% to 21%.The increase in the built-up area in Poznan in the period 1945-2000 was the cause of the biggest changes in the water cycle. During this period, the outflow through the sewage system increased from 4.9 million m^3 (3.6%) to 25 million m^3 (18.3%). The rapid (sixteen-fold) increase in runoff was mainly due to the rainwater drainage network: from 1.3 million m^3 (1%) to 20.3 million m^3 (14.9%). The interception of surface run-off water resulted in its reduction from 33.8 million m^3 (24.8%) to 21.1 million m^3 (15.5%).

In 2000, surface runoff was smaller than runoff through the sewage system. For comparison, in 1945 the surface runoff was seven times larger than the runoff through the sewage system. Infiltration decreased in 1945: 25.3 million m^3 (18.6%), in 2000, 18.0 million m3 (13.2%).

Similar results will be obtained for most Polish cities [Kowalczak P. 2010]. Unfortunately, not much research is done in this area. Instead, funds are spent on adapting to climate change. Such actions are needed, but they should be implemented on a solid basis, knowing the starting conditions in order to operate effectively. The above activity vividly resembles the actions taken by the IPCC.

Changes in the water balance

Urbanisation causes changes not only the physical, but also the chemical and biological state of our surface water and groundwater. Watercourses are being adapted to the concept of city creators. The straightened riverbanks are strengthened with materials that are not friendly to life in the river

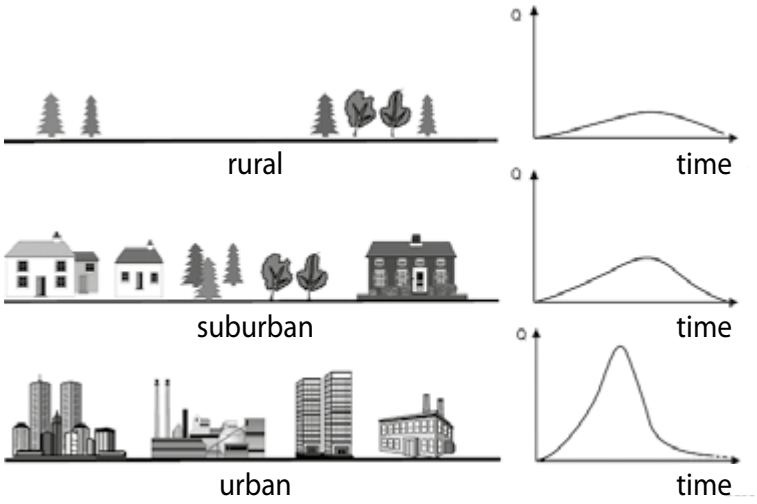


Fig.1 Changes in flow hydrographs as a result of changes in the management of the catchment area. Source: Butler D., Davis J. 2000

and the adjacent areas, river valleys are built up, vegetation covering the valleys is destroyed - the river beds and the river valleys lose their basic functions. Urbanisation processes cause significant changes in the water balance. Cities adversely change the water balance, mainly due to the increase

in the share of sealed areas, and, as a result, also the hydrological regime of watercourses, stagnant waters and wetlands is changed. Figure 1 (Fig.1) shows the flow hydrographs for various ways of managing the catchment area.

The reference of the above changes in the components of water balance to the currently propagated climate changes should, in the case of these parameters, indicate an opposite course of changes in values. Evapotranspiration is a very good example.

Water relations in cities are mainly deformed by the increase in the share of sealed surfaces. As a result of the above, significant unfavourable changes in the hydrographic network of cities occur, which concern the following elements:
- changes in the hydrological regime of waterco urses, stagnant waters and wetlands,
- changes in the geometry of watercourses,
- transport of pollutants,
- sediment transport,
- changes in the aquatic and water-dependentenvironment.

— *Minimising the impact of urbanisation — on water resources and proposing new solutions*

Urbanisation processes, by transforming the environment, create new, hitherto unknown hazards. As a result of changing the hydrological regime, watercourses become dangerous, especially during heavy rains. The frequency and flow rate of so far rare surges, and flooding of the areas hitherto not endangered by floods are increasing.

The occurring precipitation of relatively low efficiency and intensity, which has not caused any effects so far, creates new threats of an intensity proportional to the increase in the share of impervious surfaces in the catchment area. In the remaining periods of the year, as a result of the increased drainage of water from the area of cities, there is a decrease in the intensity of the lowest flows, a more severe course of droughts, the disappearance of the urban river network and other effects of adverse changes in the water regime of watercourses. Another result is a progressive decline in the underground water table. Here it is impossible to indicate the impact of climate change as the cause.

Changes in the water balance of urbanised areas are not taken into account in city planning, in particular in the locations of buildings and urban infrastructure, which, as a consequence, results in losses and damage. Counteracting these changes is possible provided that the approach to the problem of city water management is completely changed. Such activities can only be based on the results of scientific research, which provide a solid basis for the planning, design, construction and operation of water and water-dependent facilities in cities.

In Poland, there is a need to take action in the field of water management in urban areas for the following reasons:
- the need to change the current approach to the prob the need to change the current approach to the problem (large sums are spent on the rainwater drainage system draining our cities, and then we spend large amounts on the transfer of water to cities from other parts of the country, often causing damage there or contributing to the occurrence of water deficits there),
- rationalisation of water consumption - that is to use water for a specific purpose of a certain quality, we currently use the highest quality drinking water for all purposes, including households, where we use about 50% of it for flushing toilets,
- minimising the effects of urbanisation processes on the water balance, changes in the hydrographic network, sediment transport, transport of pollutants,
- limiting the effects of extreme phenomena (recent urban floods are not the result of climate change, as some scientists, media, etc. suggest, but, according to the author, the effect of excessive sealing of cities),
- improving water supply to the population - maintaining the stability of available water resources as well as their high quality and availability,
- improvement of the microclimate of cities - water in the urban environment is one of the basic elements shaping the microclimate, its impact is especially valuable during the summer heat. It should be remembered that the increasingly

frequent heat waves, which, in the author's opinion, are a product of bad urban planning, are causing more and more deaths. It is necessary to change the approach to building design, selection of appropriate materials and technologies. The creation of urban oases (parks, city ponds, walking paths) along watercourses and rivers in connection with greenery is an important aspect of improving the microclimate of cities,

- indications of threats and changes in the hydrological regime of watercourses and water reservoirs accompanying urbanisation - planners and designers are not properly informed about the scale of effects of the increase in the share of impervious areas in the city on changes in the watercourse regime. They do not take them into account in their projects, which is and will be the cause of disasters and constant destruction of infrastructure.

Regardless of its origin, water must be managed in the areas of cities. This particularly applies to water from precipitation. The role of the city's surface waters should be treated differently. It is not only a valuable raw material that has no substitute and an important element of the landscape, but above all **a large sewage treatment plant and a matrix of urban greenery,** as well as an outstanding indicator of the condition of the urban environment.

Analyses of water quality in city watercourses and reservoirs can be compared to a blood test. Their role in the city environment is also similar, as **they are the equivalent of the bloodstream of living organisms,** because they are an oasis of life in cities of concrete. Therefore, they require a change in approach. It is necessary to stop solving water management problems in small urban watercourses by connecting them to the sewage system. In this way, we are losing an attractive element of the landscape which enriches the catchment area in terms of nature, and, on the other hand, we are replacing the beneficial water self-purification processes with processes of decay. Urban water reservoirs and wetlands require protection against pollution. It is necessary to constantly monitor underground waters, being in most cases the effect of water abundance of urban catchments.

The history of cities is best documented by the change in maximum flow hydrograph size (unless LID measures are used). Compared to traditional rainwater management, the goal of LID (other equivalents to this name are SUDS, BMPs, WSUD) is to stop excess runoff after the urbanisation process at specific locations in the catchment area to imitate the catchment's hydrological regime before the development. In LID, runoff management is done at source, where the precipitation occurs, not at the "end of the pipe" as in the traditional system. Maintaining the hydrological regime from before the urbanisation process requires the use of structural and non-structural compensation techniques. The concept behind LID (*Low Impact Development*) is associated with the concept of the "hydrologically functional landscape" introduced in the American literature. And this is the basis for activities related to minimising the effects of urbanisation and introducing new methods of water management in urban areas.

In the longer term, there will be a problem of fully utilising wastewater in city areas, which is already forcing the use of green treatment plants at maximum scale. The expansion of municipal construction to formerly agricultural land is ongoing. **It is necessary to research and develop rules for the development of such areas, with particular emphasis on the development of the existing drainage network.** The lack of research and its implementation in this field means the continuation of destruction and damage to houses and municipal infrastructure by waters from the interrupted drainage network, while their implementation entails the acquisition of large amounts of good quality water for municipal purposes.

There is a need to **identify and link all water cycles in urbanised areas and indicate their place and role in the urban water cycle. The basis will be to determine the quantity and quality of water in each of the cycles, as well as the area and time variability of their parameters. Identical rules will apply to wastewater and pollution transport**. It is important to identify the causes of changes brought about by urbanisation, to determine the effects in relation to the hydrological characteristics of watercourses and to prevent losses through measures involving counteracting in the sphere

of causes and not effects, i.e. not carrying out works aimed at never ending regulation and the stabilisation of watercourse banks, instead undertaking activities connected with properly balancing the outflow of watercourses through the implementation of retention facilities proportional to the lost retention capacity of the catchment, due to the construction of new facilities (houses, parking lots, etc.) in the catchment area.

It is necessary to develop a concept of integrated water management in individual cities using functional landscape methods. The water cycle in a catchment area is closely related to the landscape, hence a number of solutions may allow for the improvement of water circulation in an urbanised catchment. It is possible to influence the hydrological cycle in almost every link of the cycle by using the traditional methods of small retention, as well as in new forms adapted to the urban environment [Kowalczak P. 2015].

The hydrological functioning of the landscape not only maintains the hydrological regime of watercourses at the level from the pre-urbanisation period, but also improves the aesthetics and habitat values of the catchment area.

Through the implementation of appropriate structures such as: bioretention devices, partition wells, infiltration ditches and the like, and proper management of this infrastructure, a functional landscape reproduces the function of the pre-urban landscape. The functions of water holding (slower outflow) and infiltration are reproduced, and other components of the water balance are also repeated, such as: increased evaporation, or increased groundwater recharge.

The "functional landscape" allows us to maintain all the more important parameters of the hydrological regime of the watercourse in the catchment area, such as the volume of outflow, the intensity of maximum flows, the control of the frequency and duration of the flow, and also increases self-purification processes of waters from rainfall and flowing watercourses, as well as reducing silting and erosion damage to pre-development levels.

Climate of cities

A characteristic feature of the urban climate is the high diversity and microclimatic fragmentation of areas with similar features. This is due to the great variety of materials constituting the surfaces of urban areas; with different infiltration coefficients, different layouts and construction of green areas, differently landscaped parts, with variable colours characterised by different albedos, even of elements made of the same material, the presence of buildings and other structures limiting access to light, changing wind directions, areas with different exposure to sunlight and a number of other factors operating separately or jointly differently in all meteorological conditions, time of day, season of the year. The indicators of this differentiation are the area and time distribution of air and ground temperature, distribution of snow cover (precipitation height, snow residence time) in all meteorological conditions, time of day, season of the year. Air temperature, sunlight, cloudiness, wind, precipitation and other phenomena (fog, air pollution) cause local modifications of thermal conditions, resulting in the occurrence of, among other things, heat islands, frost zones and the like [Kowalczak P. 2011].

A bit of history

Urban climate research has a short history. In relation to the current revelations of IPCC advocates, the study of London's climate in the early nineteenth century carried out over 200 years ago was fundamental.

Local climate changes in cities are most vividly illustrated by thermal profiles. The best known is the air temperature profile over London and its surroundings made for the first time in the second decade of the 19th century by Luke Howard [Howard L. 1818].

London's influence on its climate was discovered by Howard. Howard stated that the city's temperature should not be considered a climate because it has too much artificial heat due to its structure, crowded population, and heavy fuel consumption in fires. This is the first analysis of these two related but separate issues:
- urban "contamination" of meteorological records,
- size and cause of the urban effect.

Research into the urban climate began with climate measurements taken by Luke Howard at the beginning of the19th century at a location in the city and three locations around London. The first edition of his book about the climate of London was published

in 1818–2020. Mills (2008) describes Howard's significant contribution to the identification of urban heat islands. An example of a city weather station from around 1925 is shown in Figure 10.1. More than a century later, Tony Chandler (1965) used station data and night transects made with an instrumented vehicle to analyse the hot island of London. By reversing the route and averaging the two data sets, he was able to determine the climate conditions across London.

There are three components involved in the creation of urban climates. These are:
- modification of the composition of the atmosphere,
- surface energy budget modification,
- modification of surface properties.

The second and third of these modifications are responsible for the development of the urban heat island.

Urban heat island

An urban **heat island** is a meteorological phenomenon consisting in the thermal privileging of urban space in relation to the surrounding undeveloped areas. It mainly results from a significant change in the environment of urban areas, which influences the transformation of their properties: radiation (such as a change in the structure of short- and long-wave radiation), thermal (e.g. an increase in heat capacity), aerodynamic (e.g. a decrease in the average wind speed) or humidity (e.g. decrease in relative humidity).

The above parameters differ significantly both in the vertical and surface system. The most reliable indicator of the intensity of an urban heat island is the temperature difference between the city and suburban areas. In large American and European cities, it can reach (during maximum intensity time, i.e. at night) even up to 10-15° C [https://pl.wikipedia.org/wiki/Miejska_wyspa_ciepla]. The literature often ignores significant differences in air and ground temperature, which, even in Polish cities, may exceed 30 degrees Celsius.

Urbanised areas are places where anthropogenic activity has locally disturbed, among other things, the water and heat balance of these areas. According to the author, this phenomenon has nothing to do with so-called global warming, what is more, in research related to climate variability, urban areas should be excluded due to their specificity, because they will be a source of erroneous assessment.

These research results were obtained more than 200 years ago, forty years before the end of the Little Ice Age, about 200 years before the IPCC announced global warming, and 170 years before the IPCC released the information concerning heat islands.

It is difficult to find space for contemporary theories of heat island formation in cities due to global warming here. My latest book begins with the statement:

"I am afraid that the repair of the world, and especially water management, is taking place on the basis of a misdiagnosis. I am afraid that efforts and resources are targeted towards - the wrong actions. Driven by an illusion, we are currently exhausting our strength and measures, and we will probably also lose hope over time." ■

Literature:

Bedient P.B., Huber W.C, 1992 Hydrology and Floodplain analysis Reading, Mass Addison-Wesley

Butler D., Davies J, 2000 Urban Drainage Spon Press London New York

Chandler T.J. 1976 Urban climatology and its revelance to urban design Technical Note No149 WMO-No 438 World Meteorological Organization Geneva ISBN 92-63-10438-7

Howard L. 1818 The Climate of London: Deduced from Meteorological Observations, Published by W. Phillips, George Yard. Lombard Street, London

Kowalczak P. 2008. Risks related to water deficit. Kurpisz SA Publishing House Przeźmierowo, p. 356, Fig. 143, tab. 40. ISBN 978-83-75249-79-8.

Kowalczak P. 2010. Water dilemmas of urbanization. Kurpisz SA Publishing House Poznan, pp. 643, illustrations.343, tab. 34. ISBN 978-83-7654-116-7.

Kowalczak P. 2015 Integrated water management in urbanized areas pp.306 Publishing House Prodruk Poznan ISBN 978-83-64246-66-1

Roser M., Ritchie H., Ortiz-Ospina E. 2020 - "World Population Growth". Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/world-population-growth' [Online Resource]

Protection of nature and water resources at the JAGROL agricultural production company in the context of climate change

Stefan Jankowiak

For several years climate changes have been observed in the world. Undoubtedly, they should be attributed to humans. In the Wielkopolska region, climate change is manifested mainly by a reduced amount of annual rainfall. Our long-term observations and resulting data show that, on average, annual rainfall over the last 10 years was by 100 mm (100 l/m2) lower than previously. It should be emphasised that the rainfall before these 10 years was already not high and amounted to about 600 mm. In one of the last 10 years, we noted a record-breaking low rainfall of only 380 mm. Such a situation is aggravated by very high temperatures in late spring and summer exceeding 30° C, with strong, warm and drying winds.

The above changes affect agriculture in the first place. They cause large losses and fluctuations in crops which add to the costs and supply of food to the society, and thus have an effect on us all. According to forecasts, the situation will only worsen. Therefore, it is expected that reduced water resources will be the basic problem limiting or even preventing the development of agriculture in our region. So the question arising more and more often is what we can do to limit the consequences?

Drought can be mitigated in many ways. A change in managing water resources present in the soil is a priority. This is a very broad issue. Let me only touch upon two factors: the first is limiting the number of crops, especially in the spring. They dry the soil out the most and have the greatest impact on soil water loss. The other is sowing the soil with after-crop vegetation. We call it biologisation.

Let me make a digression here - farmers consider after-crop plants responsible for the loss of water from the soil. Of course, the postcrop vegetation absorbs soil water during its growth and development. However, our observations show that a field sown with after- crops, compared to the field that has not been sown, is able to accumulate more rainwater in its soil profile.

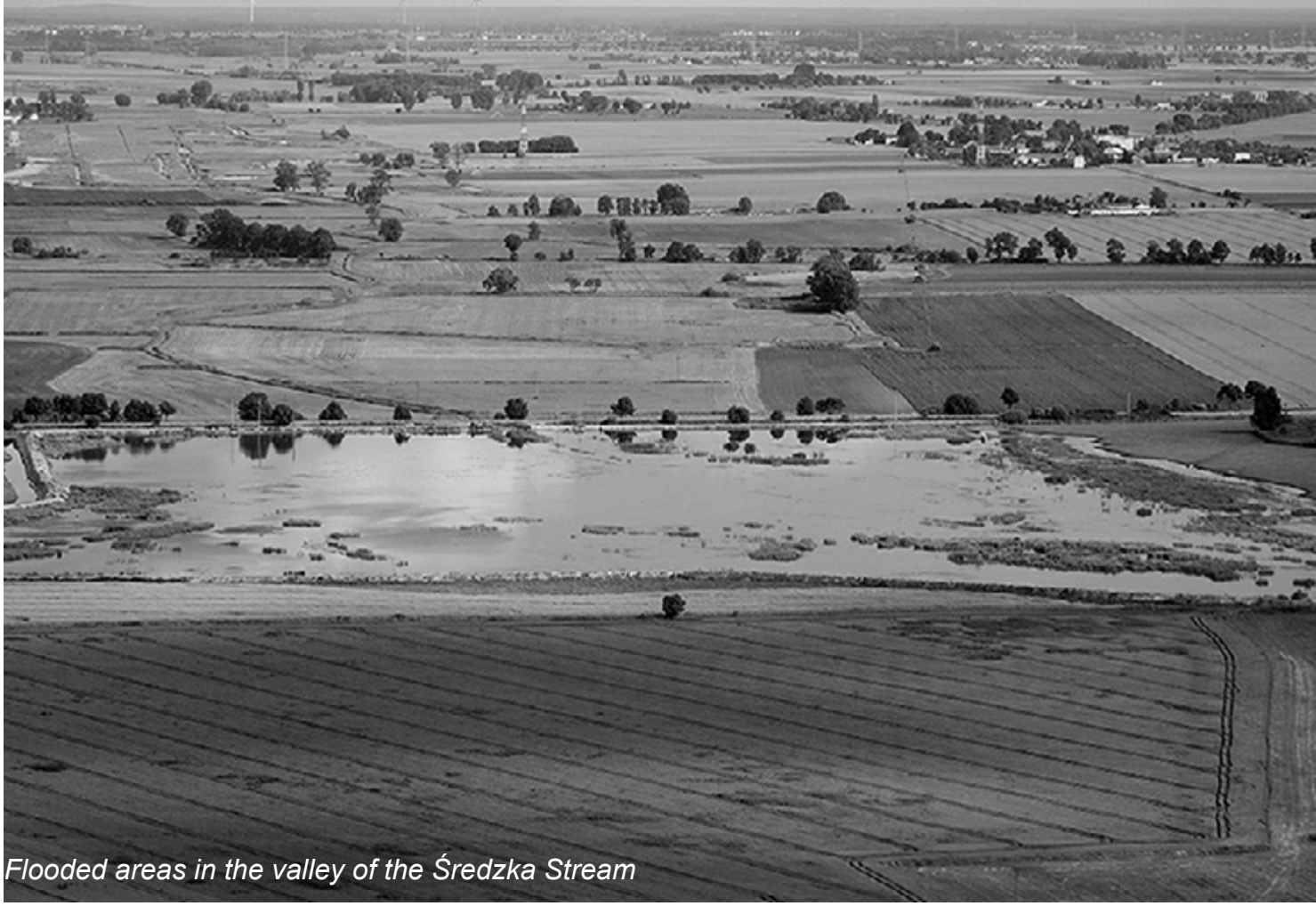
In an “empty field” during torrential rain or a cloudburst, water does not penetrate into the soil profile but flows directly into ditches or forms unhelpful pools. In a field sown with after-crops, however, water penetrates into the soil profile and is collected there. In addition, after-crops significantly reduce soil erosion. Ultimately, the water balance in fields where after-crops are grown, compared to those without them, appears favourable for the former.

Our observations are confirmed by scientific research. The above water management promotes natural water retention in the soil. Another way to improve soil moisture is to bring water to the field by irrigation. Several technologies are known in agriculture to bring water to plants. Without going into detail, it is possible to irrigate plants with reel sprinklers (this is what we practice on the Jagrol farm), drip sprinklers, stationary sprinklers and so on. However, in all these methods access to a water source is crucial, without which even the best sprinklers will not fulfill their task.

I would now like to focus on the source of irrigation water.

In agriculture, two water sources are used to irrigate plants. One of them are deep wells. If these are to be chosen, a deep well needs to be dug. It needs to be emphasised that with such a solution the availability of drinking water might be limited.

Besides, not all regions offer large amounts of deep water. Another more rational solution is to retain surface water by building a small retention facility. I would like to focus on this method the most, as the Jagrol company has great experience in building this type of hydro-infrastructure.



Flooded areas in the valley of the Średzka Stream

On this farm, with the support of the Zakłady Kórnickie Foundation, in the years 2002-2005 two retention reservoirs were built, located in the valley of the Średzka Stream (Struga Średzka). Originally, these were wastelands, collecting surface water from spring thaws, which would often flow irretrievably into the Baltic Sea. Currently, the company has a total area of approx. 65 ha of water reservoirs. These reservoirs will collect approx. 650,000 m3 of water. Such a water reservoir allows us to irrigate about 400 ha of agricultural land annually.

In the farm, potato plantations are mainly irrigated. There are plans to build a third reservoir of this type, which will allow an increase in the amount of accumulated water for irrigation and thus increase the irrigated area.

At this point, I would like to note that the current legal situation in Poland does not allow for efficient and quick execution and obtaining appropriate permits allowing the construction of such a reservoir. New legislative solutions are awaited with great impatience and hope.

The environmental benefits of such a reservoir are not to be underestimated either. With it, the agricultural ecosystem is modified by making perfect habitat for marsh and water birds. Thanks to our two retention reservoirs, new species of birds previously rare in Wielkopolska have been recently observed by ornithologists. Examples include protected species such as the black tern, black stork and many others.

Water reservoirs are also an excellent purifying tool or treatment plant for the accumulated water. One of our reservoirs is overgrown with mud vegetation, mostly reeds, by about 80%. It possesses natural water purifying potential. We also observe an increase in air humidity, with a positive impact on vegetation overgrowing these reservoirs.

Moreover, for some years now the Jagrol company has been taking strict measures to protect the environment, by reducing mineral fertilisers and replacing them with organic ones (manure and the after- crops). They increase the water capacity of the soil and thus reduce the adverse effects of climate change. Close to

Egyptian goose

reservoirs, streams and ditches we minimise mineral fertilisation and the use of pesticides.

These actions would not be feasible without new technologies. For some years, we have been applying commercial up-to-date satellite maps to determine the nutritional status of plants in individual fields and in each section of the field. We implement soil tests for its macro and microelements to design proper fertilisation schemes. These studies are of value to develop a primary soil fertilisation plan, which is later corrected based on current satellite maps.

To protect the agricultural landscape and enrich biodiversity, we have also been involved in, and supported the initiative of the local "Kogut" hunting club from the nearby town of Kórnik by making a mid-field animal refuge of 2,279 fruit trees and bushes on an area of 0.8 ha, placed closed to the retention reservoir in the village of Pierzchno. This move was co-financed by the Provincial Fund for Environmental Protection and Water Management (Wojewódzki Fundusz Ochrony Środowiska i Gospodarki Wodnej) in Poznań, the Town Hall in Kórnik and the Zakłady Kórnickie Foundation.

Moreover, the Jagrol Company, together with the Zakłady Kórnickie Foundation and the Town Hall in Kórnik, is planting trees and shrubs on roadsides as well as within buffer strips. Such vegetation, apart from its undoubtedly aesthetic values, exerts a beneficial impact on agricultural environment being refuge belts for insects and birds and limiting soil erosion.

The Jagrol Co. activities for environmental protection and water retention can be briefly summarised in the following points:

1. Construction of water retention reservoirs in the times of climate change
2. Protective soil cultivation to reduce water eva poration
3. Soil biologisation, including sowing after-crops and organic fertilisation
4. Applying „precise" agriculture to limit mineral fertilisation
5. Improving biodiversity by planting trees and shrubs of native species

By undertaking all these activities, I believe we are successfully meeting the expectations of that outstanding Pole, Władysław Count Zamoyski, who bequeathed all his goods and possessions to the Polish nation by calling to life the Zakłady Kórnickie Foundation.

As a leaseholder of part of the Kórnik properties, the Jagrol Co. feels honoured and responsible for the execution of Count Zamojski's will in terms of environmental and water protection. We would like our actions taken together with the FZK to be a specific message and inspiration to all farmers who would like to benefit from our experience. ■

An ever „flowing" story! WWF River Rangers in

Zofia Pawelska

Within one year, we have described over 100 km of rivers and carried out over 20 interventions. The involvement of 350 volunteers has made our rivers, including smaller ones, safer, as hundreds of people care about them now. Poland is one of the European countries with the poorest supply of drinking water. In a dozen years we may suffer serious problems with access to it. What keeps us alive are… the rivers! The WWF Poland River Rangers program was established to protect them.

A River Ranger

You do not need to have a degree in hydrology to protect the rivers. The WWF River Ranger programme comprises a group of nature lovers who are not indifferent to the fate of the rivers and are eager to actively work to save them. This group includes people who deal with the protection of nature professionally, but ,still, a large part of the Rangers have no official education in this field, and are interested in rivers as hobbyists. Thanks to a substantive support of WWF Poland they are able to do a lot of good for them.

The volunteers' job is to educate, monitor maintenance works on rivers and streams, collect and share data, consult documents, carry out interventions and initiate river cleaning actions. So far, 350 Rangers have been involved and are active working for the rivers in their neighbourhood.

The „Take care of me" song and action

As a part of the WWF River Rangers program, the „Take Care of a River" project was also launched to protect the most valuable sections of small and medium-size rivers in Poland, in cooperation with the local communities. Those of the community members who choose to become rangers of a specific river section monitor it four times a year, organize garbage collection campaigns, and take action calling appropriate offices when investments possibly threatening the nearby rivers are planned. The project has its promotion song and a music video by the „Rezerwat" musical band. The song is an adaptation of the band's greatest hit „Take Care of Me", which was prepared with the support of the WWF Poland. (It it here: https://www.youtube.com/watch?v=I3HN9RGRHj4)

What are the rivers for?

In Poland there are 150,000 km of the the rivers, with only 20-25% of them undamaged. The rivers are a system of communicating vessels maintaining a proper groundwater level. If they have no natural vegetation, natural shores, islands and meanders, they lose their ecological importance. Facing climate change, we should take particular care of our rivers.

A natural river is a complicated cleansing tool. It consists of sandy beaches and islands that capture organic pollutants, or coastal and bottom plants that collect phosphorus and nitrogen flowing from the fields. It is also home to many animal species, some of which play a huge role in the ecosystem services rivers provide.

SOS for the Narew river

On Saturday October 19, 2019 we learned that turbine oil was getting directly into the Narew river from the power plant in Ostrołęka. The next day the plant management informed us all problems had gone. The oil had supposedly been removed and the four emergency dams to keep and remove the oil from the water were dismantled on Sunday as redundant.

We went there on Monday (October 21) to check it out. Both, in the nearby towns and villages and at the incident site itself large streaks of oil were still flowing along the river. We alerted the Polish Waters State Holding (Wody Polskie Państwowe Gospodarstwo Wodne), the Ostrołęka power plant,

the Provincial Inspectorate for Environmental Protection(PIEP) (Wojewódzki Inspektorat Ochrony Środowiska, WIOŚ), the Polish Angling Association (Polski Związek Wędkarski) and the Fire Brigade about the unsolved problem. The latter intervened once again.

On our second inspection on Thursday (October 24), there was less oil, but it continued to flow, and no adequate measures had been taken to remove it from the river. So we sent letters to the Ostrołęka power plant, PIEP and the local Fire Brigades. We also informed the media. It was only on our third inspection (October 30) that the outlet channel from the power plant was properly secured and no oil was flowing on the Narew River. It took a week to contain the failure, with our contribution as well as others.

Why is it so important? Because, unlike domestic sewage, the leakage of which into the Wisla River in Warsaw received extensive coverage in the Polish media, this leakage went unreported. Still, petroleum-derived substances are not something a river can manage to neutralize on its own. They are highly toxic and can, among others, damage the nervous system of aquatic animals, and they are also dangerous to humans. The intervention on the Narew River is one of many activities our employees and volunteers have carried out.

We also took steps regarding an illegal landfill site nearby the Wkra river, an illegally built dam on the Rogoźnik Wielki river, embankments on the Bug river, harmful maintenance works in the Żylica river. We also cleaned the rivers of Czarna, Studnica or Długa, in various parts of Poland.

Unfortunately, the quality of Polish rivers is deteriorating due to their pollution, regulations, dam constructions and unprofessional maintenance works. In 2010-2015, we spent almost PLN 900 million in Poland to regulate small rivers, thus losing about PLN 6 million per each river kilometre - such is the value of ecosystem services any river provides to the environment that has been calculated.

As Marek Elas from the WWF Poland enumerates - *Ecosystem services are: groundwater supply, self-purification of water, facilitating inland fishing, recreational and cultural functions. Regulating and straightening riverbeds, river banks hardening, building embankments, or diggings destruct entire river ecosystems. As a result, up to 80% of habitats associated with water are in poor condition.*

Apart from the above losses, turning a natural river into a canal is simply dangerous. Regulation of river courses and their shortening, together with building up floodplains, leads to an increase in the frequency, range and destructive power of subsequent floods, reduces the environmental resistance to deficient precipitation and brings about bigger and bigger losses.

Rivers also provide drinking water to people and animals, and we will not be able to live without that. Therefore, protection of the rivers if the key to our own safety.

The WWF River Rangers programme is implemented jointly with the UPM Raflatac Company and, from 2018, also with the Geberit enterprise. ■

A BIRD-FRIENDLY SCHOOL

Jakub Kotnarowski

Birds are a part of our environment: we can meet them in parks, green squares, in domestic gardens, or even in buildings. There are species of birds that have accompanied us for centuries, for example the urban pigeon *(Columba livia urbana)*. It is derived from the domesticated rock pigeon *(Columba livia)* which was later abandoned by humans, but which did not want to leave them. The signs of its former domestication can be seen in the breeding season lasting all year round as well as in the flight distance, i.e. the distance beyond which a bird would want to escape from humans. In urban pigeons the distance is small though people have not raised them on a mass scale for a long time now.

The stories of birds do not only tell about city pigeons, however. There are species that are wild, and yet accompany people, live in our houses, together with us. The se include house sparrow *(Passer domesticus)*, common swift *(Apus apus)*, common house martin *(Delichon urbicum)*, western jackdaw *(Corvus monedula)*, black redstart *(Phoenicurus ochruros)* or common redstart *(Phoenicurus phoenicurus)*. Sparrows and swifts in particular nest in human buildings, under window ledges, in various crevices, or flat roofs *(in ventilation gaps)*, and holes in the facade. Martins build nests on the outer walls by attics, parapets, or in the window frames, sometimes even in the metallic frames of large superstores. These birds can nest, and often do, in school buildings, which we usually learn about during urban nature observations or making thermal modernisation of buildings, preceded by an ornithological report. This defines the habitat of domestic a protected bird species and, after the thermomodernisation works is completed, recommends hanging nesting boxes, suitable for a given species. Swallows can also benefit from special wooden shelves or artificial nests made of sawdust-concrete.

Such boxes can be used for educational purposes, too. The pupils can observe whether the master sparrow and the lady sparrow have made their home in them, and then whether they feed the young. Or they can notice that a box prepared for a swift has not been inhabited - this in turn may teach children that some species are not eager to settle in places once their home has been destroyed.

The common swift is an interesting bird in general - an outstanding aviator that sees the world from above, who does not land on the ground unless something happens to make it do so. It eats in the air, drinks while flying, sleeps in the air and copulates there, when meeting the opposite sex. The only time it touches any type of foundation is when it comes back to its birthplace, usually to a building, crevice or a flat roof, to lay eggs there, normally from one to three. The young will then hatch, later on fed by their parents. When they grow up, they will leave the nest for the first and last time to fly on to Africa. But - when such a place is bricked up or closed, even a nesting box suspended less than a metre away from it may not be inhabited by a swift to start a family. Hence, the efforts of ornithologists to protect such places from being thoughtlessly briced up.

What else can birds teach us? That the nest where the young hatch is not really a home but a nursery, with the young ones that make noise, sometimes get dirty, always require parental care, depending on the species, even when they are adult and able to leave the nest. Then, as fledglings, they often move on the ground a bit, sometimes screaming, sometimes jumping awkwardly, but always under the watchful eye of their parents (like jackdaws for instance). They discreetly but firmly teach young adults to be mature. Others, like swallows, can teach us how to care. Living in colonies, they feed their children and the children of other parents, so the chances of the young to become adult are quite high.

Bird observations can instruct us on their preferences as to their habitat: they not only need a nesting place in general, but one that is safe, without spikes on the roofs, places where shrubs grow, making a perfect place for the young to find shelter after they leave their nest. Birds can show us how important surroundings are for them, where they can find fat earthworms, nuts, fruits, or weeds whose seeds are a substantial part of their diet. Birds will teach us they need water to drink and to wash their wings, and sometimes a pile of sand, where they can take a sand ibath nstead of a water.

So, a bird-friendly school is a place where pupils not only learn about birds, their role in the ecosystem,

their development, or even their protection schemes. A bird-friendly school actively helps birds, and - even if it is not required by law - installs nesting boxes to support reproduction of sparrows, swifts or more. Remember - their numbers are decreasing. In a bird-friendly school shelves are mounted under the nests of swallows so that the droppings that fall out of the nest do not soil the windows. It is needed, moreover, as swallows (no matter if martins, barn, or sand), similar to swifts, eat air plankton, i.e. insects such as mosquitoes, flies or midges, and the droppings are made of the undigested shells of these insects.

A bird-friendly school has glass panes safe for the birds, visible to them. Unfortunately, elsewhere many glass panes are often transparent - you can see your reflection in them or, on the other hand, you cannot see them at all. This applies to the birds even more so! Such window transparency causes collisions of birds with them, their injury, shock or death. A one square meter window pane is often a serious obstacle for small sparrows, black redstarts, European robins or tits. On a human scale, it is the equivalent of a window pane the size of a building! Add high flight speed to it and ... tragedy ensues. The problem of collisions with glass panes and their scale are monitored by the Glass Traps Foundation (Fundacja Szklane Pułapki) which runs the National Register of Bird Collisions with Glass Surfaces (www.szklanepulapka.pl). The Foundation also teaches what to do with an injured bird after a collision (according to the CCC rule “Cicho, Ciepło, Ciemno” in Polish i.e. “Quiet, Warm, Dark” in English) as well as how to properly secure the windows. It also offers ready-made solutions which are special stickers that can show the windows as an obstacle to the birds.

The problem of bird collisions is not a new one. The first observed collision dates back 200 years ago, when in 1832 Thomas Nuttall described the case of a sharp shinned hawk *(Accipiter striates)*, which, in pursuit of its victim, killed itself against a greenhouse glass wall.

Therefore, in a bird-friendly school windows are properly secured, including glass entrance doors which are visible to both birds and people.

Finally, in a bird-friendly school children and teenagers study not only birds. They are also taught the mindfulness and patience required to spot the birds. They describe them, observe their ways, and later on talk about them to adults, explain about what is relevant to the birds, what they need to live and to reproduce. A bird-friendly school trains the pupils (and graduates) to show concern about their surroundings, their fellow humans, nature or, ultimately, the entire planet, which is home to all of us. ■

ENERGY-EFFICIENT LOCAL GOVERNMENT INVESTMENTS

Jakub Koczorowski

During the COP21 climate summit in Paris, the signatories of the agreement (including Poland) pledged to take action to stop global warming at a level of temperature rise below + 1.5° C. In the long term, the entire energy sector will need to be gradually decarbonised by 2050, which will not be possible without decarbonising the heat production sector.

— Decarbonisation strategy until 2050 —

With almost 50% of the EU's final energy consumed in heating and cooling, 80% of which is in buildings, achieving the EU's energy and climate targets requires prioritising energy efficiency and the renovation of its building stock, including the conversion of existing buildings in to nearly zero-energy buildings.

The EU sets clear targets for Member States for 2020 and 2030, which are expected to reduce greenhouse gas emissions by at least 40% (and up to 55% and more for some countries) compared to the year 1990, ensuring at least 32% percentage share of energy from renewable sources in total energy consumption. As part of this measure, all Member States are required to prepare National Energy and Climate Plans for the years 2030, 2040 and 2050. Under these plans, the trajectories of the increase in the share of renewable energy sources in economic sectors, including the heating and cooling sectors, that a country is committed to achieve, should be presented.

A long-term renovation strategy should include:
- an overview of national building stock,
- identification of cost-effective approaches to renovation appropriate for individual types of buildings,
- policies and measures to stimulate the renova tion of buildings,
- an overview of policies and actions targeting these segments of the national building stock, which demonstrate the worst performance, and an outline of the measures that contribute to alleviating energy poverty,
- policies and measures specifically aimed at public buildings,
- an overview of national initiatives to support smart technologies and buildings as well as skil ls and education in the construction and energy efficiency sectors,
- estimates of expected energy savings and other benefits such as health, safety and air quality.

— Legislation in Europe —

The directive on energy efficiency of buildings, introduced in 2010 aims at the reduction of the energy demand of buildings. The directive introduces the following obligations for the Member States:
- all new buildings must be almost zero-energy by 31/12/2020 (public buildings by 31/12/2018),
- minimum energy efficiency should be introdu ced for new buildings, for buildings undergoing major renovation and modernisation, and for buildings with the replacement of heating systems,
- compulsory inspections of heating and air con ditioning systems should be introduced.

In July 2018, the European Union Directive 2018/844 / EU of May 30, 2018 was published, amending Directive 2010/31 / EU on the energy performance of buildings and Directive 2012/27/ EU on energy efficiency. The preamble to the new directive states that the EU is committed to working towards the development of a sustainable, competitive, secure and low-carbon energy system by 2050, and to strengthening Europe's energy security, competitiveness and sustainable development.

It is therefore imperative that the directive adopts this long-term perspective. The new directive does not change the rules for drawing up and using energy performance certificates for buildings to increase their energy efficiency, but gives these activities a long-term perspective (until 2050) and, apart from energy efficiency, also sets the

decarbonisation of buildings as the main goal. (Note: in EU documents “decarbonisation” means elimination of CO_2 emissions). As is well known, in Poland, the requirement of almost zero-energy consumption (nZEB), which is currently imposed on new buildings, contained in the technical and construction regulations (WT 2021), is very difficult to meet, despite the fact that during their design, it is possible to influence energy demand by appropriate shaping of building blocks, windows arrangement and size, balcony structure and so on. In existing buildings, it is not possible to change these properties, and therefore achieving the nZEB standard will probably be possible only by replacing existing energy sources and media, as well as generating energy in the building for own needs (e.g. photovoltaic panels).

At the end of 2018, a new EU directive on renewable energy sources (RED II) entered into force, introducing new rules to which the countries of the European Union will have to comply. Many changes concern distributed power generation, including that based on prosumer installations and energy cooperatives. In Article 21, entitled “Prosumers of renewable energy”, we read that Member States are to ensure that consumers have the right to become prosumers of renewable energy, either on their own or through so-called concentrators (e.g. energy cooperatives). The rights granted to prosumers include producing renewable energy, also for own use, storing and selling the surplus production of renewable electricity, including through renewable electricity purchase agreements, via electricity suppliers and by means of peer-to-peer trading arrangements, while not subject to - “with regard to electricity which they take off the grid or introduce into the grid - discriminatory or disproportionate procedures and charges, and grid charges which do not reflect costs; and also - for self-generated electricity from renewable sources remaining on their premises - discriminatory or disproportionate procedures and any charges”.

The RED II directive also applies to prosumer energy generation implemented in multi-family buildings. Pursuant to the adopted provisions, renewable energy prosumers located in the same building, including a multi-apartment building, have the right to undertake joint activities - including energy generation for their own needs, storing and selling surplus energy - and they can make arrangements for sharing renewable energy generated on their premises or households among themselves, without prejudice to grid charges and other relevant charges and taxes applicable to each renewable energy prosumer.

Technologies of the future

Successful development of this trend is supported by energy-efficient installations using geothermal heat and solar energy. They include: earth-to-air heat exchangers - a solution supporting and complementing mechanical ventilation systems with heat recovery, heating and cooling systems for buildings using heat pumps, and a combination of heating and cooling buildings with seasonal heat tanks in the ground. A solution that fits perfectly in this trend and undoubtedly complements the above technologies is a photovoltaic installation.

How does an earth-to-air heat exchanger work?

The principle of operation of an earth-to-air heat exchanger (abbreviation EAHE) is based on the use of the ground temperature oscillating around 8°C (at a depth of approx. 1.5m below the ground elevation) to heat or cool the air flowing through the system of collectors with an antibacterial layer. This air is then transferred to the ventilation unit (usually a recuperator), where additional heat is recovered from the air used in the building and cleaned thanks to the filters in the unit. The air prepared in this way is distributed in the building by a system of ventilation pipes. Experiments show that thanks to the use of EAHE, the temperature of the supplied air can be increased by 22°C in winter and reduced by 20°C in summer. Thanks to this procedure, the air sucked into the ventilation and recuperation unit in winter is preheated, which translates into lower electricity consumption needed to heat the air to the required temperature in a given facility. Similarly, in summer, in the event of heat waves with temperatures up to 33°C, the air will cool down to 16°C after passing through the exchanger. There is then no need to install an air conditioning system that only provides cool air locally, close to the air conditioner. With air conditioners it is also easy to catch colds and headaches. The air-conditioning effect obtained thanks to the earth-to-air heat exchanger creates a much higher level of comfort as well as a stable and even temperature distribution in the rooms.

A paradox here is the fact that it is in energy-efficient and thermomodernised buildings that the partitions are sealed, which is to protect the building against excessive heat loss. However, it is forgotten that it is necessary to provide a building with an appropriate amount of fresh air. Then the room is aired by opening the windows, through which an incredibly large amount of valuable heat from the building escapes.

— Efficient and cost-effective heating — and cooling of buildings using heat pumps

Heat pumps are a technology ready for the implementation of a new energy policy strategy related to decarbonisation, being a kind of buffer between the currently functioning energy systems and the fully digitised energy systems of the future. Especially with heat pumps, it is possible to produce fully decarbonised heat for heating or cooling buildings, for use in industrial processes or for the preparation of domestic hot water.

Heat pumps are heat machines that force heat to flow from an area with a lower temperature to an area with a higher temperature. This process runs against the natural direction of heat flow and occurs due to external mechanical energy (in compressor heat pumps) or energy in the form of heat (in absorption pumps). Like refrigerators, heat pumps operate in the Linde cycle, but their

primary use is space heating and domestic water heating (although some heat pumps also have a cooling function).

Heat pumps are devices for heating, hot water preparation or cooling that convert energy (in the form of heat) from renewable sources such as air, soil or water into useful heat. Additionally, they can use waste heat from industrial processes (creating the potential for more efficient use of energy) and households (e.g. exhaust air). Heat pumps use renewable energy sources and contribute to increasing energy efficiency. A heat pump system consists of a lower heat source, a heat pump unit and an upper heat source, i.e. the heat / cold distribution system in the building.

— The use of solar energy to store heat in the ground —

Seasonal ground heat storage tanks seem to be an ideal solution for the 21st century for heating and domestic hot water preparation for small local communities.

Seasonal ground heat storage tanks allow for the storage of excessive heat energy generated in summer in the ground. This heat is then used in winter to heat single-family houses by means of the local district heating network. In this way, we use heat efficiently throughout the year, adapting to the actual demand for heat energy.

The idea of seasonal ground heat storage tanks is basically simple. In summer, the heating medium, heated in solar collectors is transported to geothermal probes installed in the ground. In this way, the surrounding ground is heated to a temperature of up to 50-60°C. In winter, this heat (needed for heating single-family houses) is collected from the ground through the same system of geothermal probes and transferred to the heating network. These types of installations are efficient in terms of technology and economics in the case of the required heating power of more than 100 kW.

— Electricity from the sun —

Obtaining electricity from the sun is a big step forward because, unlike the earth's finite resources, sunlight is always available in the same amounts. The growing costs of electricity obtained from coal combustion come from the diminishing resources of this raw material. Therefore, it should be borne in mind that these resources will shrink from year to year, causing ever greater increases in bills. Photovoltaic panels do not produce smoke and do not pollute the environment. Moreover, unlike wind or water energy generators, they do not make any noise and take up very little space.

Photovoltaic panels are made of silicon, which by capturing photons, i.e. the smallest units of light, sets electrons in motion, which generates electricity. The direct current flowing from the solar panels to the solar inverter is converted there to alternating current, thanks to which our home appliances work. This current travels through the protection system to ultimately reach the network we use to connect household appliances to the electricity.

Photovoltaic panels are mounted in such a way that they face south and capture the greatest dose of sunlight. Most frequently they are mounted on the roofs of buildings, but the lack of such a possibility does not close the door to cheap electricity, as there are other solutions flexibly adapted to the needs. The only condition is to arrange the panels so that they are not in a darkened place. However, contrary to popular belief, there is abundant sunlight in our country. At this point, it is worth paying attention to our western neighbours, who are the leader in the capacity of photovoltaic panels installed. Poland has an equally good location as Germany, so the issue of insolation is not a reason for any concern.

The above energy-efficient installation solutions offer, apart from savings, one more extraordinary benefit - the ability to control an integrated building management system (BMS). Thanks to this, we can manage these solutions in a simple and easy way, as well as optimise and control their functioning. Public utility buildings composed and designed in this way will also have priority in the procedure of granting EU subsidies or state funds. ■

Oases of clean air for Polish students

National Fund for Environmental Protection and Water Management

1,000 Polish schools will have become climate islands by 2025. The promise of Prime Minister Mateusz Morawiecki - from the exposé delivered on November 19, 2019 in the Sejm of the Republic of Poland - will be implemented as part of the "Clean Air" government programme. Educational institutions heated with smoky furnaces will undergo thermomodernisation. This is one of the measures to improve air quality.

Poland lacked coordinated actions by the government administration aimed at effectively fight ing smog. This situation changed in 2017. This was largely thanks to non-governmental organisations, which for many years have been calling for radical measures to improve air quality.

Clean air - a civilisational challenge

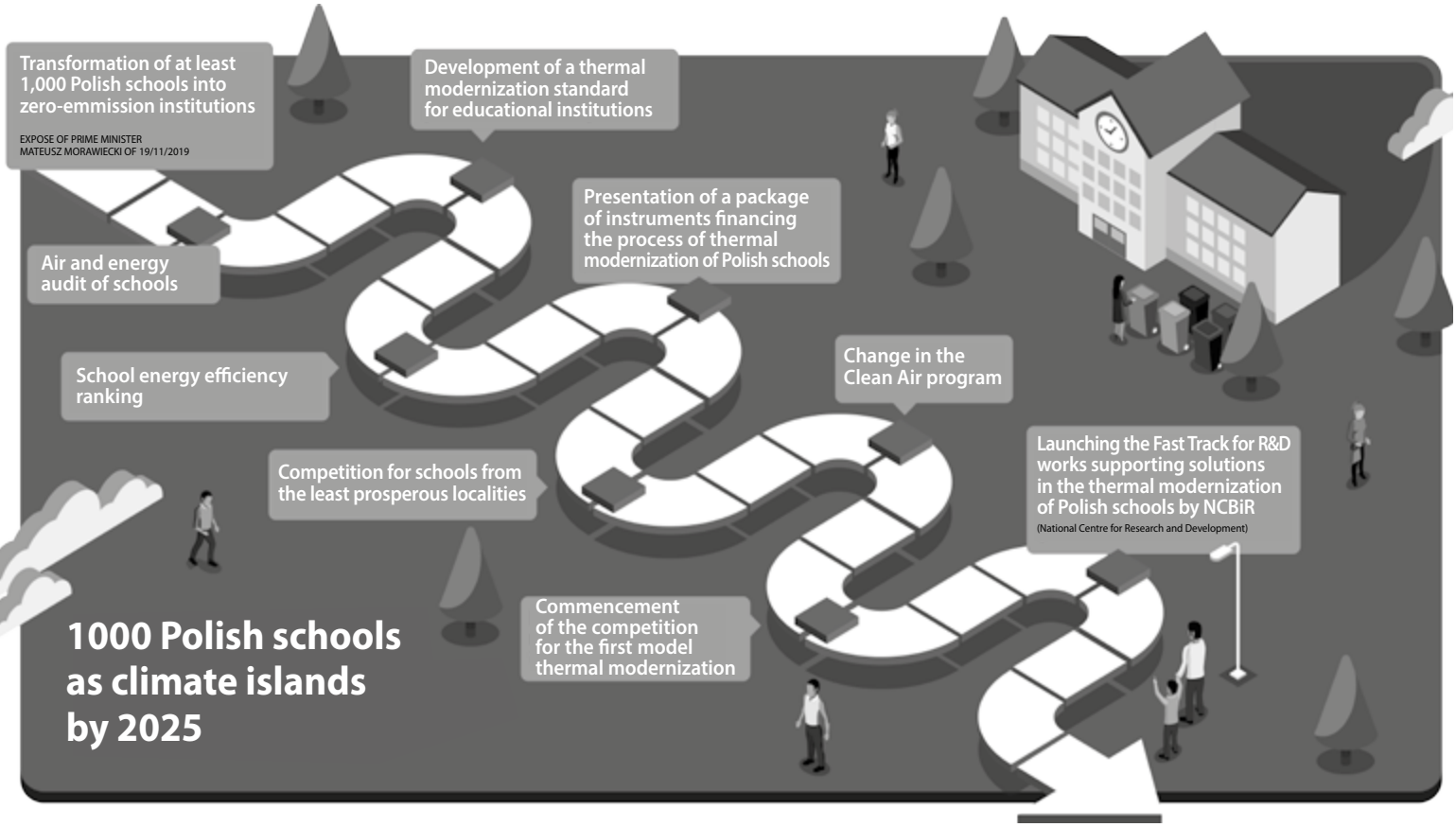
Prime Minister Mateusz Morawiecki is the first Polish Prime Minister who, in his exposé, delivered to the Sejm on December 12, 2017, emphasised the need to fight smog, saying that "Clean air is a civilisation challenge,a measure of whether Poland is really a mature country". These words were followed by a number of actions by the government administration carried out in 2018-2019, such as: governing the quality of coal burned in domestic stoves or the elimination of all-fossil domestic boilers, known as so-called „sooters", from the retail market. At the same time, work was underway to build a support system for Polish households in the fight against smog. These activities led to the creation of a support system in the form of a thermomodernisation tax relief in personal income tax, the "Clean Air" program, e worth 103 billion PLN, implemented by the National Fund for Environmental Protection and Water Management in cooperation with the regional environmental protection funds, and the "STOP SMOG" programme, whose aim is to support the least affluent households.

Combined forces against smog

Smog elimination in Poland is a process which, due to the scale of neglect and the main source of smog, namely uninsulated residential buildings equipped with obsolete solid fuel boilers, must be spread over a period of 10 years. That is the reason why the implementation of the "Clean Air" programme is supposed to last until 2029. The necessary condition for the effectiveness of thermomodernisation investments is a profound change in the awareness of energy users, because the way buildings are utilised has a decisive impact on energy consumption, especially after their thermomodernisation. Such a change requires the involvement of significant resources and cooperation of all institutions that can and should contribute to its implementation, and therefore, apart from the public administration, also the educational system, public and private media, church environments and social organisations.

CO_2 versus the quality of teaching

Undoubtedly, the most effective strategy of the awareness revolution in the field of energy efficiency is to combine thermomodernisation investments and investments in renewable energy sources in educational institutions with the educational process covering the entire school community. This mainly results from the specificity of the structure and the way in which school buildings are used. Thermal balances of educational institutions are characterised by a high demand for energy to heat ventilation air - over 50%. Under conditions of a high level of air pollution and the widespread use of ventilation systems, consisting in airing classrooms during breaks between classes, the air quality in school classrooms is often worse than the air quality outside, because there is a rapid increase in CO_2 concentrations and the concentrations of microbiological contamination in closed rooms. Microbiological contamination is a source of school epidemics, which are not only a problem for the implementation of the curriculum, but also an economic problem resulting



1000 Polish schools as climate islands by 2025

from the parents' sick leave for childcare and increasing costs of medical treatment. The high concentrations of CO_2 typical of schools is CO_2 <2000 ppm, which drastically decreases the quality of teaching, the effectiveness of which drops significantly. Such concentrations of CO_2 have a disastrous effect on the working conditions and health of teachers and pupils.

Climate islands for students and teachers

For these reasons, the governmental work programme, announced by Prime Minister Mateusz Morawiecki in his second exposé, which was presented to the Parliament of the Republic of Poland on November 19, 2019, contained a commitment to modernise Polish educational institutions by transforming at least 1,000 of them into zero-emission schools. This is a reference to one of the most important postulates of the Green New Deal, announced by the new President of the European Commission, Ursula van der Leyen, who, as one of the elements of this plan, indicated the transformation of at least 1,000 school establishments located in small and medium-sized cities of the European Union into so-called "schools - climate islands".

The goal set by the government of Prime Minister Mateusz Morawiecki is 1,000 zero-emission schools in Poland. For the purposes of its implementation, the "Clean Air" programme will be supplemented by a pillar financing the modernisation of ventilation systems in educational institutions, combined with thermomodernisation of facilities with the lowest energy standards, in particular those heated with outdated solid fuel boilers. These investments will be accompanied by installations of renewable energy sources in educational buildings, in the form of heat pumps and photovoltaic panels. By carrying out these investments, these institutions will become oases of clean air for students, in addition, these buildings will gain the status of energy independence, and, most importantly, the level of CO_2 concentrations in classrooms will allow for effective educational processes. ■

The Francis' Tree
- a pedagogy of integral anthropocentrism

Dariusz Grzybek

The Zakłady Kórnickie Foundation created the Francis' Tree Programme, which was launched in 2016 with an art competition conducted in all primary schools in the Kórnik commune. From the very beginning, the intention of the authors was that the territorial coverage of the Programme should be much broader. Project activities in the next two years, gathering experience, expanding the environments, and building networks resulted in 2020 in the organisation of a competition for primary schools all over Poland. The competition is now the main pillar of the entire Francis' Tree Programme.

Within three years, the project gained new communication and education tools. It has become a dynamic structure with over a dozen regional plenipotentiaries and the periodical Francis' Tree Magazine, which is sent to all local governments in Poland twice a year. The assumptions also include an ambitious plan to organise 16 local regional conferences bringing together various communities: scientists, practitioners, academics, teachers, officials, priests, ecologists.

Taking care of the natural environment, protecting forests and animals has not been an invention of recent years. Since the dawn of time, man, with his primordial love of beauty, has respected and adored places and objects that make up the natural environment. In the past, this special relationship with nature was associated with religious worship or the possession of power. The examples include the role and importance of sacred groves, forests and trees rooted in the culture of, for example, Celts, Slavs, Balts and Aryans. In many places on Earth, we have dealt, and still are dealing with the sacralisation of nature: mountains (Fuji - san), rivers (the Ganges) and other natural objects. The practical approach of people possessing royal power allowed them to protect beavers (King Bolesław the Brave) or limit yew tree felling (King Władysław Jagiełło).

However, secular authorities did not always have to influence the perception of nature through legal acts. The best example of a true revolutionary in contemplating the natural environment was the Poor Man of Assisi. His intuitive search for Truth and fusion with the world around him - although it was a real challenge for his contemporaries, and even for us, people from the postmodern era - still captivates with his uncompromising nature today. It can only be presumed that this was one of the reasons for proclaiming St. Francis the patron saint of ecologists in 1979 by St. John Paul II.

Most modern environmental movements draw their inspiration from the revolution of the 1960s. The palette of shades of groups, concepts and theories related to shallow, moderate or deep ecology is extremely wide, and the process of creating new social phenomena in the context of ecology is very dynamic. It is enough to cite examples of such concepts as human ecology, eco-ethics, social ecology, ecofeminism or biocentrism[1].

As a rule, these trends negate or modify the anthropocentric approach to a greater or lesser extent. Other environments also participate in the discourse on the role of man and his involvement in nature protection. Especially those for whom spirituality is an immanent feature of man. Churches, religious and faith-based communities, which emphasise the important role and tasks of man in relation to God, the Creator or the Absolute, grow out of the tree of spirituality. The social teachings of the Catholic Church over the centuries shows how essential and important an issue is the non-accidental role of man in the received trust and management of the Earth. This is especially visible in the teaching of the popes at the turn of the 20th and 21st centuries. The pontificates of St. Paul VI, St. John Paul II, Benedict XVI, or Francis brought us a new approach to humanism as such. Integral humanism and Christian humanism build the perspective of the development of human dignity on the basis of a transcendent God and shape intergenerational solidarity.

Our project is a response to this kind of perspective and demand. The Francis' Tree, with its activity, fits into various trends of pedagogy. It resounds with features characteristic of the pedagogy of culture. We also find elements of personalistic and existential

pedagogies, but first of all it is rooted in the pedagogy of religion, in particular the Christian religion.

The aim of the creators of the Francis' Tree Programme was, and still is, to develop the comprehensive programme of educational activities related to the broadly understood environmental protection, drawing inspiration from Christian values and having its practical dimension. It is a deliberate attempt to fill the wording of the definition of pedagogy as the total area of reflection on education and educational practice at the same time[2].

One of the specific goals of the Programme is to draw attention to five themes taken from the encyclical of Pope Francis *Laudato si'*. These issues were defined in the speech by Archbishop Stanisław Gądecki during the patronal ceremonies in honour of St. Roch in Mikstat in 2015. They are: universal communion of creatures, integral ecology, intergenerational solidarity, ecological education and ecological conversion[3]. According to the assumptions of the Francis' Tree competition, they are to provide inspiration for specific activities related to the protection and shaping of water resources, biodiversity, ecosystems and landscapes, and counteracting harmful emissions to the atmosphere, as well as solving problems in to urbanised areas.

The achievement of these goals is supported by building an open educational space in which the boundaries of operation of many institutions are blurred. Various environments take part in it: schools, local government offices, parishes, state institutions and non-governmental organisations. In this holistic educational space, God - Man is the point of reference. He is the centre of our life: existence, cognition and evaluation.

In practice, the Francis' Tree competition is multi-stranded in both form and content. Children and young people - the recipients of the Programme - become the inspirers and moderators of educational activities targeted at adults. Adults participate in this process by sharing their knowledge and experience. Practical activities start the moment the competitors enter the competition. It is the development of a common idea, creation of assumptions and foundations on which projects will be developed, aimed at engaging as many people as possible.

The next stage is the planting of trees by children, youths, teachers, parents, priests, foresters, local

1. See: Agnieszka Gromkowska-Melosik, Ecological Pedagogy, in: Pedagogy, Zbigniew Kwieciński, Bogusław Śliwerski (ed), Polish Scientific Publishers PWN 204, p, 425.

2. Zbigniew Kwieciński, Towards the pedagogy of the borderland, 1990.

3. See: Christian Ecologists Portal [8/12/19]

politicians and other people who want to participate in the common effort. The intentions and emotions that trigger participation in such a meeting do not matter. We consciously treat planting a tree as a symbolic creation of a microworld. This act means taking responsibility for a specific work and establishing relations with specific people, caring for creatures that will seek shelter in the crown of a tree, among leaves, or in the root system. It is a reflection on responsibility, not only for an act that has been done, but also, and perhaps above all, on what connects the past with the present and what consequences this has for the future.

Referring to Roger Scruton, it can be said that we do not change our environmental policy[4], but we change attitudes and our approach to building a community aware of their actions. We teach the consequences of the decisions made. Decisions that could affect the lives of future generations.

The rivalry between teams consisting of children and adolescents, teachers, and group supervisors is nothing more than forging noble virtues, it is a search for beauty and good, also in ourselves. This is the process Russell Kirk referred to as the creation of the aristocracy of the spirit. Individuals become a team, and building team competences strengthens all participants. It is about creating responsibility for joint work. This is in line with the teachings of the Primate of Poland, Archbishop Wojciech Polak, which read as follows: *And this is also the beauty of human life, the beauty of the society that we create, our life together here on earth that each and every one of us, contributing something own, their own unique personality, own skills and talents, own work and creativity, makes in his life also in order to enrich others with them, to contribute to the creation of common good, to building a reality in which we all participate*[5].

By rejecting our ambitions, unhealthy competition, and creating a community of people participating in civilisational changes, reflexively using the surrounding nature, we become leaders of change in our environments.

In order for this participatory change to be permanent and effective, it must be conscious[6]. Only then will the efforts put into the implementation of the Francis' Tree Programme bear fruit in the future. ■

References:

Agnieszka Gromkowska-Melosik, Ecological Pedagogy, in: Pedagogy, Zbigniew Kwieciński, Bogusław Śliwerski (ed), Polish Scientific Publishers PWN 2004.

Zbigniew Kwieciński, Towards pedagogy of the borderland, 1990.

Michał Kurtyka, Gerard Roth, Change management. From strategy to action., Wydawnictwo Fachowe CeDeWu pl. Warsaw 2010,

Roger Scruton, The Green Revolution. How to seriously think about our planet., Zysk i S-ka Wydawnictwo, Poznań 2017.

Teaching of Archbishop Wojciech Polak, Metropolitan of Gniezno, Primate of Poland, Volume I 2014 - 2015, Gaudentinum Publishing House, Gniezno 2019.

Portal of Christian Ecologists

4. See: Agnieszka Gromkowska-Melosik, Ecological Pedagogy, in: Pedagogy, Zbigniew Kwieciński, Bogusław Śliwerski (ed), Wydawnictwo Naukowe PWN 204, p, 425

5. Teaching of Archbishop Wojciech Polak, Metropolitan of Gniezno, Primate of Poland, Volume I 2014 - 2015, Gaudentinum Publishing House Gniezno 2019, p. 575.

6. Michał Kurtyka, Gerard Roth, Change management. From strategy to action., Wydawnictwo Fachowe CeDeWu pl. Warsaw 2010, p. 21.

The Francis' Tree in Wielkopolska (Greater Poland). What was it like in 2019?

When entering the Wielkopolska edition of the Francis' Tree competition in 2019, we were guided by the assumption that we wanted to raise the environmental awareness of young people and activate them to carry out environmental activities in their municipalities and parishes through school environmental protection projects.

Contrary to previous editions, this time the projects could refer to one of the selected aspects (water protection, air protection, waste management, nature / biodiversity protection, earth surface protection, environmental protection in urbanized areas), or could cover all of them in terms of cross-section.

The Francis' Tree programme in 2019

The Francis' Tree programme was implemented by Zakłady Kórnickie Foundation in cooperation with the Complex of Landscape Parks of the Wielkopolska Region, the Regional Directorate of State Forests in Poznan, the Regional Directorate of State Forests in Piła and the National Fund for Environmental Protection and Water Management.

Organisational and financial support was provided by:

- Poviat Starosty in Poznan,
- The Town and Commune of Kórnik,
- Tarnowo Podgórne Town and Commune,
- Poznan International Fair SA,
- National Fund for Environmental Protection and Water Management,
- Aquanet SA,
- Jagrol,
- TFP,
- Łopuchówko Forest Inspectorate,
- Człopa Forest Inspectorate,
- Trzcianka Forest Inspectorate,
- Zdrojowa Góra Forest Inspectorate,
- Paul-Pon Poland.

72 school teams from 39 local governments entered the competition, and 51 school teams ultimately entered the final stage, presenting their reports on the activities carried out.

The theme of FTP 2019 was "*Respect for life - respect for the environment, a Christian way to improve the state of the environment*".

The teams could undertake their initiatives in any formula: educational programmes, radio broadcasts, series of press articles in local media, campaigns to cooperate with local authorities, educational festivals, school research programs, field activities, ecological campaigns, and many more.

As a result of the evaluation carried out by the competition committee (Dr hab. Ewelina Ratajczak, Institute of Dendrology of the Polish Academy of Sciences in Kórnik, Michał Białek, Complex of Landscape Parks of the Wielkopolska Region, Karolina Kapałka-Boratyńska, Regional Directorate of State Forests, Anna Czarny, Poviat Starosty in Poznan, Krzysztof Mączkowski, Kórnik Foundation) confirmed by the Jury of the Francis' Tree Programme Competition 2019 (Jan Grabkowski, Poznań Starost, chairman; Dariusz Grzybek, president of the Management Board of Zakłady Kórnickie Foundation; Grzegorz Skrzypczak, member of the Board of Zakłady Kórnickie Foundation; Tomasz Markiewicz, director of the Regional Directorate of State Forests in Poznan; Paweł Śliwa, acting Director of the Landscape Parks Complex of the Wielkopolska Region; Przemysław Pacholski, Mayor of the Town and Commune of Kórnik; Father Marcin Głowiński, Rector of the Seminary in Poznan), the final classification was as follows:

In the junior classes category:

3rd PLACE - PRIMARY SCHOOL NO 36 IN POZNAN: "TREES IN OUR REGION"

The project involved the reconnaissance of the place

where the pupils live, the school community and the relationship between them and the environment:
- knowledge of the place of residence requires involvement in exploring the area, distinguishing its institutions and elements affecting human well-being: cultural institutions, street patrons, air quality, the condition of vegetation,
- performing a survey, inventory and measure ment of trees in the school area,
- taking actions that attract attention and use modern technical and IT solutions.

The aim of the project was:
- developing knowledge about nature, the ability to cooperate and share knowledge, improving the knowledge of a small homeland and school, exchange of ideas, a chance to solve emerging challenges and problems, safe communication of own expectations,
- developing the ability to take measurements and use modern media to present the results of undertaken activities,
- making a map of the dendrological image of the region,
- making people aware of the relationship be tween the state of nature and human well-being.

2nd PLACE - PRIMARY SCHOOL IN SŁOCIN: "WE WILL CLEAN UP THE EARTH, WE WILL RECOVER THE EARTH"
Educational project focused on waste education in a broad sense: the management of municipal waste, electronic waste, etc. In the project, children not only learn, but also teach their parents and guardians:
- Why segregate?
- How to segregate?
- What to pay attention to?

The slogan of the project was: "Even children segregate rubbish!"

The project also covered other environmental issues:
- How to behave in your surroundings?
- How to save water?
- How to save energy?

By making eco-fashion shows, the children showed how senselessly we waste raw materials and how much waste we produce every day.

1st PLACE - PRIMARY SCHOOL NO 54 IN POZNAN: "LETTERS FROM THE TREE OF LIFE"
Working and writing together, children created a touching story - The Rescued Seed of the Tree of Life, they also created a Balcony Guide and a Board Game.

Due to the unconventional nature of the task, its scope, level of commitment, children's concern and enthusiasm, the competition committee and the chapter awarded the highest scores without any doubts.

In the senior classes category:
3rd PLACE - PRIMARY SCHOOL IN KUŹNICA GRABOWSKA: "WHAT THE KUŹNICA TREES RUSTLE ABOUT".
The students took advantage of the astonishing, natural location of their school in a beautiful place in the commune. One of the intentions of the project was to learn and implement the Decalogue of St. Francis of Assisi and bringing people closer to his personality during the retreat (April 2019) through screenings of films about this saint (in the younger grades "0" -III and older grades IV-VIII).

There was a exhibition of art works - an interpretation of the Decalogue of St. Francis, and the art works reflected the students' own imaginations and ideas. They were performed in groups in individual grades I-VIII. The works were displayed in the corridors of our school, as well as in the park during the picnic on the occasion of the School Patron's Day on May 18, 2019.

Every year on the Patron's Day, we organise sacred music concerts in the school's courtyard, at the monument of Cardinal Karol Wojtyła. "The surrounding old trees and shrubs, with the setting sun, create a unique atmosphere and enhance the sound of beautiful music" wrote the third prize winners in their report. They invited children from special departments to cooperate.

Our history and our activities make us realise that the Kuźnik trees rustle about:
- ancient history
- skirmishes of war
- the life, activity and creativity of the people of that time
- lost natural values
- our time, about us, that we live, learn and want to live in a beautiful environment

- the need for further care for our environment so that it can serve future generations
- the fact that local authorities often fail to perceive the value of historical and cultural sites, which leads to an irreversible loss of these properties.
- the fact that there are still many forgotten, neglected, but very charming and interesting places hidden among the trees"- summarise the students from the school.

2nd PLACE - PRIMARY SCHOOL NO. 3 IN WRONKI: "COUNTERACTING HARMFUL EMISSIONS IN THE ATMOSPHERE".
The project focused on the issues of Wronki citizens' awareness of the state of air purity.

The "Francis' Tree 2019" project entered into the work plan of the Budget, Finance and Economic Development Committee of the Town and Commune of Wronki.

The project consisted of surveys, research, interviews with local decision-makers, promoting clean air, pointing to the sources of contamination, reminding, educating in every place possible: in the Municipal Council, among school pupils, among adults, children, on the streets, during events and festivals. Clean Air Guardians were everywhere.

1st PLACE - PRIMARY SCHOOL IN LUSOWO: "JUST BEE - THE BEE MISSION".
As a result of the project, pupils - not only members of the project group, but also other pupils of the school - learned about the importance of bees in the ecosystem.

Every pupil:
- knows the dangers related to mass bee extinction;
- can indicate actions for the protection of bees;
- on the basis of the activities carried out, gained basic knowledge in the field of ecology.

The elements of the project are:
- Hotels for bees
- Sowing flowers in the spring
- Bee Day, which took place at the Primary School in Lusowo on May 22, 2019. On this occasion, we organised an exhibition, a bee maxi game, and we placed codes with interesting facts about the life of these insects at all levels of the school. The teachers of the junior division received materials from the educational package in the form of crosswords, colouring books, worksheets, and more, which they meticulously used.
- Ecological catechesis. We managed to conduct this in grades 4-7. The students' involvement, willingness to discuss and the desire for specific actions only confirmed the group's need for all eco logical activities in our school.

In the report, the students wrote: *What did we learn during the project? First of all, that we owe our favourite fruit and vegetables (i.e. 1/3 of our food) to the work of bees. We can tell the difference between a honey bee and a mason bee, a wasp or a bumblebee. We got to know the best pollinators and how the pollination process itself works. We learned that there are many theories about the mass extinction of bees and what actions we can take to prevent it*.

The Francis' Tree 2019 final took place during a conference organised by the Zakłady Kórnickie Foundation during the POLECOSYSTEM Fair. The conference was attended by approximately 200 participants and was a chance to listen to the lectures:

PART I. SPIRITUAL AND CIVILISATIONAL CHALLENGES FOR MODERN ECOLOGY
- Feast of Creation, a Franciscan philosophy of respect for the Earth. Father Dr Stanisław Jaromi, Chairman of the Ecological Movement of Saint Francis of Assisi.
- The most important problems of water management in urbanised areas. Prof. Piotr Kowalczak, hydrologist;
- Trees and forests in conditions of global warming. Prof. Andrzej M. Jagodziński, Director of the Institute of Dendrology of the Polish Academy of Sciences in Kórnik;
- A national park as a temple of nature. Rafał Kurczewski, Deputy Director of the Wielkopolski National Park;
- Climate change as acivilisational challenge. Prof. Zbigniew Kundzewicz, Polish Academy of Sciences;
- International, intergenerationaland interfaith cooperation in the field of environmental protection as exemplified by the activity of the Pilgrim Association. Rembert Schleicher, Member of the Board of Pilgrim;

PART II. MEETING WITH THE GUEST OF THE CONFERENCE, SZYMON HOŁOWNIA
Meeting with Szymon Hołownia entitled *Why does God order the earth to be protected?*

PART III. FINAL OF THE FRANCIS' TREE COMPETITION 2019

The honorary patrons of the event FT 2019 were:
- MINISTER OF AGRICULTURE AND RURAL DEVELOPMENT,
- Governor of Wielkopolska (Greater Poland),
- Marshall of the Wielkopolska Region
- Archbishop Stanisław Gądecki, Metropolitan of Poznan,
- Elżbieta Leszczyńska, Schools Superintendent in Wielkopolska.

The media patrons of FTP 2019 were:
- Feast of Creation. Portal of Christian Ecologists
- Radio Emaus,
- Catholic Guide,
- TVP 3 Poznan.

This could be the end of the "technical summary" of the competition. However, it is worth saying a few words more. There are several elements that distinguish the works of students participating in this competition.

Looking at this edition from the coordinator's perspective, I saw for the first time how, in many cases, school teams successfully combined several spheres: ecological and cultural, using what they have "at hand": either a convenient school location (e.g. Kuźnica Grabowska), or a teacher who inspired them with literary passion (e.g. Poznan). School teams - although small, only 5-person - were so convinced of what they were doing that they were able to infect larger communities with their positive passion, appearing without fear or restraint in front of official commune authorities (e.g. Wronki). And that's good!

Another reflection is that the competition was entered - and won - by school teams led by teachers who do not deal professionally with ecology (e.g. Lusowo), which shows the universalism of the competition and its ideas.

In the Francis' Tree, passions that can be shown from many different angles are really enough - you do not have to deal with ecology professionally, you do not have to teach science or biological subjects. Here you need to know what is important and have this universal sensitivity to the matters of the environment, regardless of the profession.

The structure of the competition gives you a chance, it allows you to show your commitment from many sides.

I was amazed, which is apparently not common in competitions, by the enormity of great emotions, joy, conviction about what is being done, regardless of the final result. As one of the teachers said, her team decided to enter the competition not even reading the information about all the prizes provided for in it.

And one more thing: when I visited a dozen or so selected teams all over Wielkopolska, I was surprised by the positive approach to life, without any doubts, without disappointment and without complaining. Only joy included in every gesture and every word, even when it comes to describing the ecologically uninteresting communal reality.

Great respect for them and my great joy that I could meet them - pupils, teachers-tutors and school principals. ■

Spiritual Aspects of *the Francis' Tree*

Reflections of a catechist and teacher.

Jarosław Haładuda

The Francis' Tree Programme carried out by the Zakłady Kórnickie Foundation is inherently accompanied by the idea of raising ecological awareness among children and adolescents based on the social teaching of the Catholic Church. It could be argued that this is not a programme for everyone, because not everyone knows the social teachings of the Catholic Church on ecological issues, or - if they do - they do not always want to participate in projects backed by churches or religious associations. However, potential recipients of the Programme may include people who not only know the attitude of the Church to ecology and have already become staunch supporters of integral ecology, but also those who are accompanied by ambivalent feelings. I met just some such recipients in March 2019 during the conference inaugurating the Programme. Apart from the "eco-enthusiasts" there were skeptics, stronger and weaker believers, catechists and ordinary subject teachers.

What brought them here? - I asked myself. - Was it a real desire to know and implement a vision of Christian commitment to ecology in their schools? Or maybe the "magnet" was a prize of considerable value?

Ultimately, these were the questions I also asked myself. Then, during the course of the project, I kept asking other questions so that over time my "private" list of questions became quite long.

— *Laudato si'* or Saint Francis of Assisi - how to start this project? —

A few years ago, during the Sunday homily, the vicar in my parish presented the faithful with the new papal encyclical *Laudato si'*. There was no enthusiasm in his words! He seemed rather confused and lost. This attitude caused a stir among the parishioners, who themselves began to wonder about the relationship between giving up driving a car in favour of riding a bicycle (this example was used by the priest then) and the salvation of their souls. No! It wasn't and is not that easy! Let no one believe that the clergy, theologians or catechists know these "matters" well. So it's not *Laudato si'* you should start with! We have to start with Saint Francis of Assisi.

A number of associations about the saint arise on the mind map. The record that he is the patron of environmentalists is by no means striking. I wrote it in pencil and hastily. At the center is the mystical encounter between Francis and the Crucified. Yes! This event is the most important thing! My thoughts go far away to the Alps, to Alvernia, where God imprinted the signs of His Passion on the Poor Man's body.

- Will it not be too difficult for "my kids" (class 1c, pupils with whom I decided to implement this project)? The Francis' Tree is the Cross of the Lord Jesus Christ!

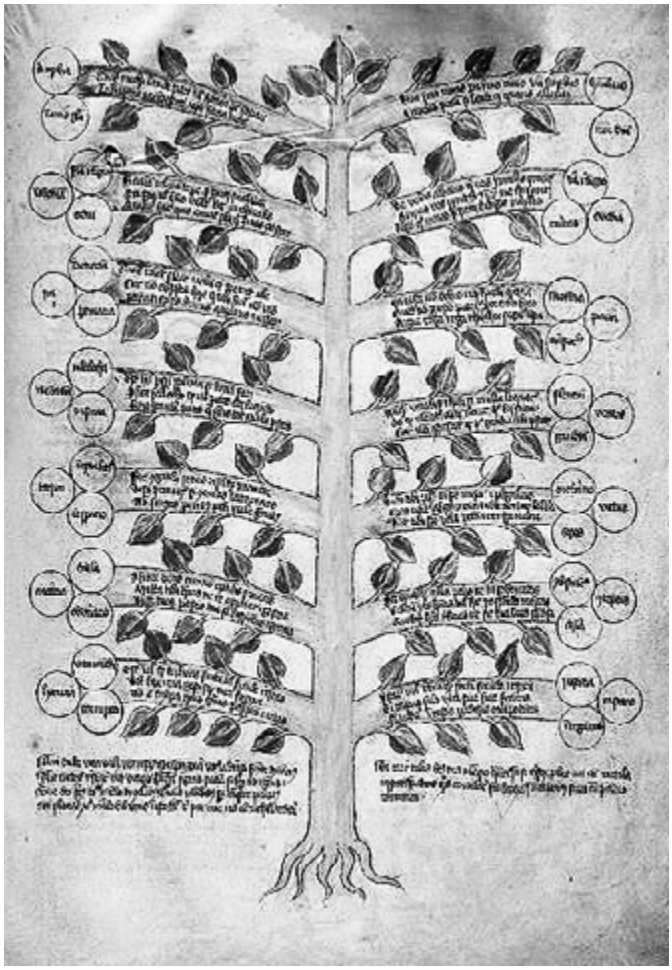
Saint Bonaventure in "The Greater Legend" compared the mountain of La Verna to the Mountain of Transfiguration and Mount Horeb. So the "mountain" itself has a transforming power. It is enough to lead others to its foot.

— Hold on! Saint Bonaventure is a reliable signpost. —

The religious consideration he described, which he depicted in the form of the Tree of Life, was of a didactic nature - the metaphor was to help the faithful to remember and understand. In Bonaventure's narrative, 12 branches with 48 leaves and 12 fruits grew from a tree trunk on 3 levels. Each leaf corresponded to one virtue or event in the life of the Lord Jesus and was one verse throughout the history.

I decided to show my students one of the pictures of the Tree of Life, whose creator - a painter, was inspired by the story told by Saint Bonaventure. It was not an easy choice at all. I finally decided on a few images, hoping that the children would refer to one of them. They stopped for a longer time at this image (which in fact does not represent the Tree of Life, but the Tree of Virtues):

The children, in line with the specifics of their development, first noticed the mathematical regularities, so they counted branches and leaves, and only then asked about the “fruits”. One of the schoolgirls associated the leaves with letters. Thus, the school project was named “Letters from the Tree of Life”.



— Educational perspective. Teacher, expert, explorer…

Over the long years of my teaching work, I have learned to work using various methods. I do not stick to one of them, but I always try to select the suitable one for a given problem. In the case of “Letters from the Tree of Life”, I chose to work using the project method according to Lilian Katz’s assumptions. “Almost all children nowadays go to school and everything is organized for them and their time is animated. I suppose that’s why they seem completely incapable of generating their own concepts and ideas”, Agatha Christie once said. I couldn’t agree more with Ms. Christie.

My teaching style is based on the subjectivity of each of the members of the learning space. Lilian Katz, who described the method of projects in her own way, paid the greatest attention precisely to subjectivity. Children want to feel a sense of agency! The role of the teacher is therefore not to teach in the classical sense, but to assume various roles. So being a “companion”, expert, facilitator, guide... But you should never stop being an adult to children. Children, especially little ones like my pupils, needed and need authority.

The success of my group in the Francis’ Tree programme (winning 1st place in the 1st - 4th grade category) did not result from the “spirituality” of the project (which a catechist might be suspected of), or from the use of sophisticated pedagogical practices. This success was mainly the result of listening to each other. Not only listening with our ears, but multi-sensory listening. In his Letter to the Romans, Saint Paul writes: “faith comes from hearing, and hearing through the word of Christ” (Romans 10:17). A simple observation: without listening there is no faith, without faith there is no salvation.

— Fruit —

This is not about a reward (in the material sense), although his is also important. There were five leaders in the project, and the class that indirectly participated in the entire project consisted of 24 children. The remaining 19 pupils who did not receive the “physical” award were sad that they had not been properly appreciated, although they fully understood what the competition rules were. I planted a “tree” with these kids, literally and figuratively. You won’t believe how quickly it gave us fruit! Maybe it did not bear fruit like sweet apples or juicy and fragrant raspberries. Our tree has borne the first fruit of virtues! What is a virtue? Today, almost no one uses this term anymore. A virtue is an act of the will to resist something bad or some kind of attachment. A virtue is also a victory over the self and a triumph of the soul over the body, because virtue lifts a person to the level of heaven! Good fruit grows at the top of the tree for a reason.

What virtue did this “tree” produce? The children - leaders together with their parents, decided

to share the prize with their other colleagues, classmates and the teacher. Together they also decided to donate part of the award to charity. Indeed, it is a virtue that determines the health of the soul and its beauty!

Reflection for the future

It's raining outside, leaves are falling from the trees... I have not yet replied to the last letter - an e-mail from Ms. Ashley from the USA, our first 'correspondent' in the project. We are now thinking about establishing cooperation with a Polish community school...
The trees need rain! Even the autumn ones!
Open website... poet Reiner Maria Rilke adds to our project:

With a branch that was never like it,
God, the tree, will once again be a summer
proclamation and rustle out of maturity;
in a land where people listen,
Where everyone is as lonely as me

For only to the lonely is revealed,
and to many lonely of the same kind
more is given than to the narrow one.
Because another god will appear to each
until they realise close to crying
that through their miles of thinking,
through their hearing and denying them
differently only in a hundred of his own
does one God go like a wave.

This is the finest prayer
that those who see then say to themselves:
the root God has borne fruit,
goes to break the bells;
we come to the quiet days
in which the hour is ripe.
The root God bore fruit.
Be serious and see.

[from the 'Book of Hours', Vilnius, 1935]

/Translation from German into English – Wikisource/

■

Education in the field of nature and environmental protection at the University of Life Sciences in Poznan

Maria Drapikowska

Since the beginning of existence on Earth, man has been interested in the surrounding environment. In primitive societies, knowledge of nature's resources was a guarantee of survival. In ancient times, observations of nature allowed for the collection of significant knowledge for humanity about the environment and its impact on the human body. The level of knowledge at that time, however, did not allow an understanding of mutual relations between organisms and the environment, and thus for the organised protection of nature.

In Poland, at the beginning of statehood, the rulers, wanting to protect particularly valuable game animals, issued laws prohibiting hunting in the royal or princely forests. Only in the nineteenth century, during the so-called industrial revolution, when people realised how devastating the effects of the development of transport and industry were for the environment, were attempts made to adopt a modern approach to the protection of nature. However, these actions took place at a time when Poland was under partitioning, which was not conducive to the development of these ideas. For a long time, research in the field of nature conservation took place independently of the development of ecology. The penetration of ecology into the protection of nature began relatively recently, which allowed for the development of a scientific basis for the protection of environmental resources while maintaining sustainable economic development, and nowadays these ideas penetrate all fields of the natural sciences. We are slowly realising that the rational management of environmental resources will allow us to maintain the ability to survive together with the populations of plants and animals, as well as entire ecosystems and landscapes.

The global human impact on the environment is the sum of the actions of all people, including each and every one of us. We have direct contact with nature almost every day, and that is why it is so important to be fully aware of our actions and their effects. Economic changes are inevitable and desired by society; the problem is to minimise their environmental consequences. An important motivation for making efforts to protect nature is a good understanding of the causes and effects of the destruction of nature. However, undertaking protective measures without solid substantive preparation sometimes causes dire results. In order to effectively protect nature, thorough education is necessary, from primary and secondary school levels to the level of higher education. Solid academic preparation guarantees, above all, good mastery of selected areas of biology, especially ecology and the principles of scientific methodology.

The education on offer in Polish universities includes many fields of study related directly or indirectly to the protection of nature. The University of Life Sciences in Poznan is a university with a 100-year tradition of academic agricultural and forestry studies and one of the most important scientific universities in the country. In its mission, it refers to the outstanding patron of the university, Count August Cieszkowski, an outstanding inhabitant of Wielkopolska (Greater Poland), a renowned philosopher, patron of science and agricultural education.

The wide educational offer of the university is tailored to the varied interests of young people, in particular to the requirements of the labour market. The curricula are innovative, taking into account modern ecological solutions and the necessary biological information and social knowledge. The University of Life Sciences in Poznan educates nearly eight thousand students in thirty fields of study. Among the rich educational offer, an important position is occupied by full-time study fields and postgraduate studies focused on ecology and nature conservation. One of the basic fields of study is a general academic course - Environmental Protection. The first-cycle study program includes education in the field of life sciences, the organisation of nature and environmental protection, municipal waste management, identification and monitoring of major threats to the environment, application of new technologies in environmental protection, including biotechnology, legal and economic aspects, and ecological education.

Students continuing or undertaking second-cycle studies in the field of Environmental Protection can choose from several specialisations, namely nature conservation and natural resources management, soil resources protection and environmental geochemistry,

environmental monitoring and assessment. In the course of their studies, they gain comprehensive knowledge, among other things, in the field of environmental microbiology, ecotoxicology, the protection of nature and management of its resources, natural regeneration, air and water protection, protection and shaping of soil resources, reclamation of degraded areas, environmental biogeochemistry, environmental monitoring and assessment, legal and economic knowledge, and spatial planning. The broad profile of education is enriched with field classes carried out in recognised enterprises, study trips, internships and the ERASMUS scholarship programme. This programme enables students to travel abroad for educational purposes (e.g. undertaking study, doing an internship, training or involvement in voluntary activities).

At the University of Life Sciences in Poznan, there is a second-cycle interdisciplinary study course unique in the country - Nature conservation, and nature and forestry education, which is conducted by teachers from both the Faculty of Forestry at Poznan University of Life Sciences and from the Faculty of Biology at Adam Mickiewicz University in Poznan, and is aimed primarily at graduates of first-cycle studies in forestry, biology and environmental protection. The student acquires knowledge about biological diversity, its hazards and methods of environmental protection. They acquire skills related to the preparation and substantive assessment of documentation, expertise, protection plans and protective tasks. A clear benefit of the course is the combination of theoretical and practical knowledge, in the form of field classes, which allow students to gain skills and experience.

Within the framework of many different fields of study, the University of Life Sciences conducts classes in subjects whose programmes contain content concerning nature and environmental protection. And so, the research and teaching staff of the Department of Ecology and Environmental Protection of the Faculty of Environmental Engineering and Spatial Management conduct, among others, classes in Environmental Protection, Environmental Monitoring, Agricultural Basis of Environment Shaping, Hydrobiology and Ecology of Water, Pro-ecological Agricultural Systems, Ecology of Wetlands, and Biology, Ecology and Applied Ecology. We also conduct scientific research, and as a consequence of these activities, education in the framework of master's and doctoral laboratories, mainly focused on ecology, the protection of nature and of environmental protection, including bioindication of valuable natural water ecosystems, assessment of the biodiversity status of wetland and meadow ecosystems, development of protection plans for environmentally valuable areas. Then we focus on the analysis of biodiversity threats resulting from synanthropisation of plant cover and, consequently, biological invasions. Master's students are also introduced to topics related to the stress reactions of plants to air pollution and the bioindication methods used in the assessment of tropospheric ozone levels.

The Department of Ecology and Environmental Protection has many years of experience in organising scientific and training courses on hydromorphological (RHS, HIR) and macrophyte assessment of rivers in accordance with the guidelines of the Water Framework Directive. Training sessions have been held continuously since 2004, and nearly 1,000 students have participated in them. So far, nearly 40 courses have been held, including several away courses in cooperation with universities in Poland and abroad.

The university also offers post-graduate studies for people professionally related to the issues of environmental protection and management, which requires a thorough knowledge of both the processes taking place in ecosystems and environmental threats resulting from the emission of pollutants of municipal, agricultural and industrial origin. Undertaking postgraduate studies - Protection of biodiversity and environmental management, is to support the development of specialist competences of people professionally associated with the issues of environmental protection and management, as well as graduates of various faculties interested in this subject. The studies are interdisciplinary. The study programme includes knowledge of biodiversity and the functioning of the environment as well as the legal grounds of environmental protection. Students learn the methods of monitoring environmental threats, acquire the skills to prepare evaluations of natural resources and environmental reports on investment and construction processes.

Knowledge of the scientific basis of the protection of nature and the resulting goals and methods of operation in our society remains at a very low level, hence the need for education as early as at the stage of primary and secondary school. Therefore, the educational programmes developed at Poznan ULS are also aimed at younger students. At this point, first of all, projects co-financed by the European Social Fund should be mentioned: Become a Young Environmental Engineer - a course conducted as part of the University of Young Naturalists. ■

The International Education Network PILGRIM

Piotr Kubiak

How can you encourage Turkish students to join the Austrian-Polish project concerning the Defencse of Vienna of 1683?

Why dohave economic school students choosen to make disabled children their creative partners toin starting a new class at school in the largest slum in the world of Matare, Kenya?

How toshould we run an international project ofinvolving two kindergartennursery schools from Poznań, Poland and Vienna, Austria on 50 Polish zlotiesy (the equivalent of 13 US dollars)?

Students and their teachers involved in the International Education Network PILGRIM in Poland and abroad are currently looking for answers to these questions as they conduct their projects. To understand what PILGRIM is, we will briefly outline the cultural environment in Austria in which it was brought to life.

Development of environmental awareness in Austria and PILGRIM

In the 1980s and 1990s, various initiatives concerning environmental protection began to emerge in Austria, in schools and universities. Thousands of students successfully organised protests to rescue the Danube Valleys (Donau Auen) where the construction of a hydroelectric power station was planned. The effective defence of these areas in December 1984 is considered a milestone of democracy and environmental awareness in Austria. In 1992, a model of schools working in the spirit of sustainable development, called "OEKOLOG-Schulen", was designed. About 400 schools joined it. Actions undertaken in the spirit of sustainable development are treated as a priority in those schools. The model was followed by a series of new initiatives at various levels of education, designed to shape the young generation's environmental sensitivity. We can refer to it as a new model of teaching ecological awareness being put into practice in the 1980s and 1990s in Austria.

Twenty years of such activities and the experience gained resulted in a new initiative. Namely, the Austrian Federal Ministry of Education, Arts and Culture approached the Religious Pedagogical Institute of the Archdiocese of Vienna with a concept to expand sustainable development education by adding a religious and spiritual perspective to it. The idea fell on fertile ground and resulted in a year-long project called: "nachhaltigkeit & religion(en) - eine pilgerreise" ("sustainable development and religion(s) - a pilgrimage"). It was carried out in the 2002/03 academic year through a common effort of schools, universities, the evangelical and catholic institutes of religious education and the Vienna Gardens. It consisted in a series of lectures, seminars, symposiums and practical actions for environmental protection. The project was supervised by 60 scientists, teachers and practitioners in gardening and tourism. Four thousand seven hundred people took part in all of these initiatives that year. After a year of intense activities, the project was declared a success and a decision taken for it to be continued.

The PILGRIM was born.

PILGRIM – the name and meaning

PILGRIM is an Old Germanic word. It is best translated into contemporary German with the term *Pilger* and into Polish as *pielgrzym.*

Dr. Johann Hisch - the founder of PILGRIM - produces two arguments to explain the name: firstly, PILGRIM was started within the Christian culture, and its name is imported from the Bible; secondly, as is often highlighted by the founder of PILGRIM, this name is in fact a task: each of us is a pilgrim on this earth, we travel on it for a short period - and we should behave like pilgrims, guests, with respect, without destroying the earth

and preserving it in the shape we encountered when we arrived at it.
The full name of this organisation is the International Education Network PILGRIM. It is a group of institutions in Austria and abroad, mainly schools of various levels and types (some other institutions are members, too): nursery schools, primary, secondary and higher education schools, special education schools, private schools, religious schools (Christian or of other denominations), national minorities or language schools (a Polish school in Bratislava, Slovakia, a Romani school in Hungary).

The PILGRIM idea is practised by ca. 250 institutions in Europe and the world. It is present in Austria, Germany, the Netherlands, the Czech Republic, Slovakia, Hungary, Ukraine, Peru and Poland.

The PILGRIM idea

The idea is realized through (fig.1):

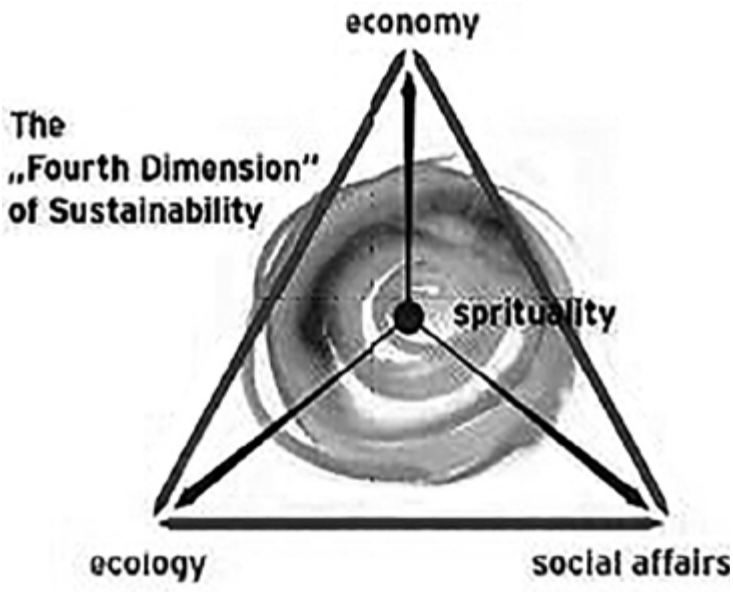


Fig.1 The PILGRIM triangle of a sustainable development model

• **Pro-ecological work:** on one hand this means admiring the world and helping students to experience its beauty, and on the other, reflecting on the place and tasks man has towards creation, noticing examples of natural environment damage and helping to find and suggest ways out of crisis situations;

• **Economy:** this is perceiving economic development as fair, aiming not only at profits, but also at the good of man and of all creation. Students are made sensitive to the manifestations of honesty in life (e.g. by asking themselves: "Can I copy a copyrighted photo for my presentation?"), fair allocation of tasks and work (e.g. while working on projects, individuals are made accountable for a given task and others take it for granted their partners would carry them out dutifully);
• **Pro-social work:** is aimed at recognising the dignity of every human being created in God's image, regardless of their origin or social position. Students learn solidarity with the poor, and material and individual sacrifice (like devoting time and energy to the benefit of others).
• **Spirituality:** this is exposing oneself to the world of values, asking questions about the meaning of ecological and social activities and introducing spiritual experience to education. The logotherapy creator, the Viennese physician Viktor Frankl, considers the sensation of beauty, religion, and the talents both latent and realised, as parts of spirituality. The spiritual dimension is characteristic of man. One of the fundamental tasks in human life is finding its sense. This can be done by following a set of values, and by actively and creatively contributing to the life of a community.

How is spirituality manifested and realized in the PILGRIM scheme

PILGRIM derives from religious (Christian) spiritual reflection. This is made evident through the terms applied, like "creation" or "the Creator" to define the world around us and its genesis. A PILGRIM-type education perceives reality through spirituality. Such perception is present in the teaching and actions undertaken. PILGRIM advocates a spiritual approach to be present in all aspects of education. Spirituality is an inherent part of education and should be an integral part of it. It creates a comprehensive, holistic approach. PILGRIM is open to any type of spirituality practised in a given school or community. Schools in Ukraine are an example, which naturally refer to Uniate or Orthodox spirituality in their projects. Joint ecumenical or inter-religious actions in Austrian schools, with great religious diversity among students (more than 20 religions and

denominations in one school), contribute to a good climate and mutual openness of various groups of students. Ethical, philosophical or aesthetic dimensions build PILGRIM's spirituality.

In conclusion, PILGRIM is not just another church-attached group or some other "soft" ecological form of catechesis, but a type of education process that involves all school subjects and highlights the spirituality essential to those subjects.

— PILGRIM's practice —

How does the PILGRIM idea look in practice? Any school that holds an educational project on sustainability and spirituality can become a PILGRIM school after meeting quality criteria. It is obliged to carry out one or more projects annually and to continue these actions for at least 5 following years. Projects can be undertaken by the whole school or a single class. The topics are chosen from the three areas of sustainable development: ecology, economy and society.

The PILGRIM project may combine all three areas, but may also focus merely on one. The specificity of PILGRIM among similar pedagogical initiatives is its fourth dimension: spirituality, which tops up and complements the three pillars of sustainable development.

Spirituality is understood as the abundance of religious, ethical, aesthetic and philosophical experiences. A valuable and profound experience for primary school pupils is setting up a St. Francis garden (or Austria's favourite St. Hildegard), planting and naming all the herbs and flowers, gaining basic knowledge about their healing properties, and - in terms of spirituality - learning the saint's biography and having a thanksgiving service for the work of creation...

— PILGRIM in numbers —

During the 17 years of PILGRIM, over 1,200 projects have been carried out in institutions operating at all levels of education (Fig. 2). These works were initiated by over 800 educators working in more than 250 universities, schools and other educational institutions.

— A PILGRIM certificate —

PILGRIM is special not only because it inspires to pro-ecological and pro-social activities based on spiritual values. PILGRIM honours educational activities, thanking students and teachers for their work, showing them to a wider audience and awarding them international PILGRIM certificates.

On completion of its first project, a school reports it to those responsible for the IEN PILGRIM in a given country or region. On this basis, it is invited to a PILGRIM certificate awards ceremony, organised annually in various centres. The PILGRIM certificate is recognised, especially in Central Europe, as an international quality mark for a school's educational activities.

It is often the case that the schools potentially interested in joining PILGRIM wonder what the benefits of the PILGRIM certificate are.

In response, we can cite the PILGRIM international network activities completed to date, such as scientific support provided during systematically organised training sessions, conferences and workshops in Poland and Austria. The Department of Sustainable Development and Spirituality was established in The University College of Teacher Education Vienna / Krems (KPH-Kirchliche Paedagogische Hochschule Wien/Krems). The Department's employees organise conferences, publish articles and hold training courses both in Austria and abroad. They work on new teaching aids for trainers and students. "Children, the Fate of This Land Is In Your Hands" is an excellent handbook available for trainees during PILGRIM training courses and conferences, as well as through mail order bookstores in Poland. Cooperation with other PILGRIM members, extensive contacts and experience exchange among educators in a given region are important, too. This happens especially during many training sessions and scientific conferences. International contacts and cooperation among nursery schools (!), schools and universities are no less valuable. They add extra value to educational work and enable young people to gain experience in other countries.

— PILGRIM in Poland —

PILGRIM reached Poland five years ago, thanks to Krzysztof Lausch. This charismatic special needs educator and long time headmaster of the 103 Maria Grzegorzewska Combined Special Schools in Poznań, having studied the educational idea of PILGRIM, admitted he had long searched for such a pedagogical concept that would combine pro-ecological elements with charitable and social ones, and was open to spirituality. A concept which would place both student and teacher in a honourable position, and which would appreciate and award their great, beautiful and valuable work with a certificate.

This late Poznań educator, who can rightly be called the Father of PILGRIM in Poland, wrote about it this way:

The PILGRIM motto is: "Living consciously - Giving future". In a nutshell, the basis of this conscious life are pro-ecological activities, together with a fair economy and taking into account pro-social actions. Living this way, you shape a sensitive, spiritual man who builds a better future for the world. What you need is experiencing true values, touching broadly understood culture and, finally, basing your life on reliable knowledge

(K.Lausch, „The first leaflet on PILGRIM in Polish")

Today, activities in the spirit of PILGRIM are undertaken in four centres located in the Wielkopolska, Mazovia, Silesia and Lublin regions. Each year, new institutions are joining PILGRIM. For the spring of 2020, the certification of 6 new schools and centres is being prepared in the Sosnowiec diocese (Silesia region), which, since 2018, have intensively performed worthwhile projects in the spirit of PILGRIM. In total, over 30 schools, two universities, social welfare centres and two nursery schools have been certified. Every year, in various parts of Poland, international training conferences and certification of new centres are held, in which educators and students from various universities and high school students participate. One of the largest meetings of this type. "European Youth Meeting - PILGRIM before the UN Climate Summit COP24 in Katowice", took place on November 23-25, 2018. The participants of this three-day rally - young people of PILGRIM schools from seven European countries - dynamically presented their desire to protect the Earth and its resources.

Together with conferences and training sessions, books and papers inspiring educators with new ideas are published. The book "Children, the Fate of the Earth Is In Your Hands" is an example of this. It is intended for pupils aged 7 to 14 years and can be successfully employed to teach environmental science, geography, biology, and religious education. It is purchasable by mail-order from the Księgarnia św. Jacka in Katowice. International annual exchange of PILGRIM schools representing various countries is carried out. Teachers get to know one another at conferences and establish international contacts. It does not require participation in large European programmes, nor does the school require a lot of bureaucratic effort and approval from the sponsoring institution. The value of such exchange is meeting fellow teachers and getting an insight into the education systems of other countries.

International projects for sustainable development and spirituality are initiated annually. They are highly appreciated by students who meet their peers from abroad, contribute with their interesting ideas and discover the value of the good education acquired in their own school in Poland.

PILGRIM Poland is independent of PILGRIM Austria, but is attached to the International Education Network PILGRIM, based in Vienna. In Poland, it has its own board and official representatives in given centres, known as the ambassadors of the International Education Network. The website www.pilgrim.at provides information about new activities, conferences and certifications, and provides materials needed to start new projects. ■

The goodness of creation in the Christian tradition

Rev. Tomasz Nawracała

In the beginning, God created the heavens and the earth (Genesis 1: 1). The opening words of Genesis belong to the revelation that Christianity shares with Judaism. These are the first words that carry a message and that will become the foundations for looking at the world in both of the above-mentioned traditions. The heaven and the earth are the two extremes of the created world, which for the inspired author express the totality of creation. God made not only the heaven and the earth, but also everything that can be accommodated on them and between them. All beings were created by God, and therefore all are also good. The affirmation of the goodness of creation returns in the description of the biblical origins of the world as a refrain. Whatever God does, everything is good, good and beautiful.

The Holy Bible describes, first of all, the history of salvation, the main subject of which is man. On the sidelines of these stories, however, he speaks of a creation that is a necessary, though mute, witness to the most important salvation events. For inspired authors, the created world is lutterly interlinked to such a degree that what concerns one part of creatures also affects the others. Ultimately, they all participate in sin and in redemption insofar as man himself enters into the mystery of evil and the mystery of grace. Because of man, all creation suffers the consequences of the transgression of the first Adam, but because of the new Adam, because of Christ, it participates in the hope of the appearance of the sons of God and the disappearance of sinners.

The world created by God is a complex reality. It consists not only of the visible but also of the invisible. Created beings are both material and spiritual, or - in the case of man - composed of both. Recognition of this dual nature of creation raises the question of the mutual relation of these dimensions in front of both traditions. Should both dimensions be treated equally or should one dimension be favoured to the disadvantage of the other? The answer to such a question was quickly established in Judaism, and then also adopted by the Church. On the one hand, the goodness of matter, which in itself is not bad, is constantly emphasised. On the other hand, the visible reality is considered more noble and dignified because it is free from change. Beings composed of matter are constantly changing, while spiritual beings remain unchanged. For this reason, the spiritual dimension of creation was considered better, that is, more valuable, and the justification for such a thesis was sought in the arrangement of the text of the Book of Genesis. First, God created the heavens, which were granted the privilege of priority and only then He made the earth, which in the order of creation takes second place.

The goodness of creation, its participation in the history of salvation, and the primacy of spirit over matter are three essential features of the created world, to which we should add one more: origin and destiny. In the biblical tradition, the created world is not a self-existent work. It was made by God and only in Him does it find the explanation for its existence and its own purpose. The creative act was uninterruptedly understood as existence where there was nothing before. This act not only endowed things with existence, but also explained their existence as such and no other. Each created being has certain features that define it in its existence and make it different from other beings as well. Since the reason for such existence cannot be found in beings themselves, which are changeable, it seems necessary to introduce a cause external to all creation. This cause must be sufficient and effective through its existence, and act according to the established order to avoid chaos. The created world is not a set of chance, but reflects the mind of the Creator, who not only makes concrete things exist according to their nature, but also sets a goal for each of them. This goal is communion with the Creator, who, when creating, does not exclude his creations, does not treat them as inferior and does not cut himself off from them. The Creator

is with His creation, and the creation should be with its Creator. Where the relationship fails, both the beauty and purpose of creation disappear. Beings lose their meaning. The greatness of the world and its harmony reflect the greatness of God the Creator, who in the first act of existence knows the end of all creation. Just like an artist who knows what he wants to achieve and what his work will be like before he starts work, also God when creating sets a goal for what will appear as a result of his actions. The created world is beautiful from beginning to end, and Christian hope says nothing about destroying this world, but about changing it.

These few threads concerning the creation grew out of an analysis of the work of creation recorded in the Book of Genesis. They were the heritage of Judaism and permanently entered the Christian tradition. Unfortunately, with the spread of the Gospel, there were also currents for which matter was of no value or was even perceived as evil. Docetism, Gnosticism, Manichaeism are only ancient examples of philosophical and religious trends that perceived materiality as a result of sin, and human life as a constant effort to break free from it. Although the Church managed to overcome them, there was no question of a complete victory. The Cathars and Albigensians in the Middle Ages again saw the element of evil in matter and proclaimed the need to free themselves from it. It is interesting that at such moments God reminds us of the value of the material world in a different way. When the first heterodoxist currents appear in Christian antiquity and the Church tries to define the doctrine of original sin and its consequences, at the same time there are wonderful commentaries and homilies from the Book of Genesis, and especially to Hexaemeron. From Origen and Basil the Great, through Ambrose and Augustine to Bede the Venerable, all Christian authors emphasise the positive value of creation. In one of his homilies at Antioch, St. John Chrysostom states:

"And does the narration about creation concern us?" That is what concerns us, beloved. Because if through the greatness and beauty of creatures we properly contemplate the Creator (Wis 13: 5), then: to what extent we devote our time to the beauty and greatness of creatures, so much will we be led to the Creator. It is a great good to know what is creation and what is the Creator; what is the work, what the Maker. If the enemies of truth were able to thoroughly separate one from the other, they would not confuse everything by rearranging what is at the bottom with what is at the top: not in the sense that they would drag the stars and heaven down and bring the earth up, but in that they brought the King of heaven from the royal throne and put him together with the creation, and gave the creation the first place, being due to a deity... Heaven is beautiful for you to worship Him who created it; the sun is luminous so that you may respect its Maker; but if you want to be in awe of creation and stop at the beauty of the works: light has become your darkness, or rather you have used it to enter the darkness. Do you already understand what a good thing is understanding of what is said about creation?[1]

What is read in the book of creation, is the beauty of the Creator. For this reason, scholastic theology will divide the origins of creation in the theological view and detach the act of creation from the work of separating and distinguishing beings, often called the decorating act. The wealth of creatures testifies to the power of the Creator, and they themselves are not hostile to man. The example of St. Francis of Assisi shows how wonderful the admiration for the natural world could be:

Praised be You my Lord with all Your creatures,// especially Sir Brother Sun,//because He is the light of day and You illuminate us through Him.//And he is beautiful and radiant with great splendour://Of You Most High, he bears the likeness.

Praised be You, my Lord, through Sister Moon and the stars://In the heavens you have made them bright, precious and fair.

Praised be You, my Lord, through Brothers Wind and Air,//And fair and stormy, all weather's

---

1. John Chrysostom, Homily I: Gen 1, 1f, 1, in: Jan Chryzostom, Homilies on the Book of Genesis (first series: Genesis 1-3), introduction, transl. and comp. S. Kaczmarek, Krakow 2008, pp. 52-53

moods,//because you give your creatures a sustenance at all times.

Be praised, my Lord, through Sister Water, // because she is very useful and humble, and priceless and pure.

Praised be You my Lord through Brother Fire,// through whom You light the night//and he is beautiful and playful and robust and strong.

Praised be You my Lord through our Sister, Mother Earth,// because she nourishes and watches over us,//and produces various fruits, and colourful flowers and grasses[2].

The admiration for creation can be seen in the art of the Middle Ages. More and more boldly, to decorate churches and books, not only plant ornaments, but also animals, often in very fantastic forms and based only on the authors' imaginations, are introduced.

Unfortunately, the end of the Middle Ages also brings a divergence between the Holy Bible, theology and natural sciences. The latter will start dealing with creatures according to their own methods and with more and more individualisation. The overall perspective of creation is lost, and each being is treated without being related to the environment in which it occurs. The price of cognition often means degradation and destruction. Man, in the name of his own misunderstood dominance over creation, feels like an unfettered master. He can do whatever he wants and everything is permitted.

The renewal of the theology of creation takes place under the influence of two impulses. The first comes from the Eastern tradition. The turn of the nineteenth and twentieth centuries brings extensive research on antiquity as well as a great return to the sources, and the gradual access to the texts of Eastern Christian theologians brings a wealth of view on God's work. In the Eastern tradition, the creative act is understood according to a different concept of God. It is about separating, more logical than real, who God is in himself from His actions. This action is called energy (Greek: enèrgeia) and is the way of God's revelation in the world. The very essence of God, however, remains inaccessible to man. God, in his energies, carries out the divinity the world, and thus, acting, creates a plane of harmony between himself and his creation. The study of the created world is not a goal separate from a certain religiousness, since the subject of study itself is subject to God and permeated with Him. Creation is a reality that reveals God and leads to Him, and dealing with creation has something of a liturgy: it is an activity for the benefit of the world - the cosmos and its Creator. The second impulse comes from Protestant theology, and its most important moment is the publication of Jürgen Moltmann's book *"God in Creation"*[3]. It was the first Christian book on ecology. Already in the introduction, the author writes:

Being confronted with the progressive industrial exploitation of nature leading to irreparable losses, we ask ourselves, what does it mean today that we believe in God the Creator and have this world for His creation? What we call an environmental crisis, concerns not only the natural surroundings of man. It is, after all, nothing but a crisis in man himself; it is a crisis of life on our planet, so evident that it can be called apocalyptic without any exaggeration. This is not a temporary phenomenon. It seems that this is just the beginning of the fight for life and death for the survival of the Blue Planet[4].

At the same time, developing the idea of the Sabbath and the new beginning of creation which was the Resurrection of Christ, the German theologian proposes to restore to the created world a day of rest, *"*a day without polluting the environment"[5], the day of celebrating the Sabbath of Creation. Here's the antidote to the world:

For a long time people looked at nature and themselves only in terms of their work. They saw only one side - the utilitarian side of nature. (…)

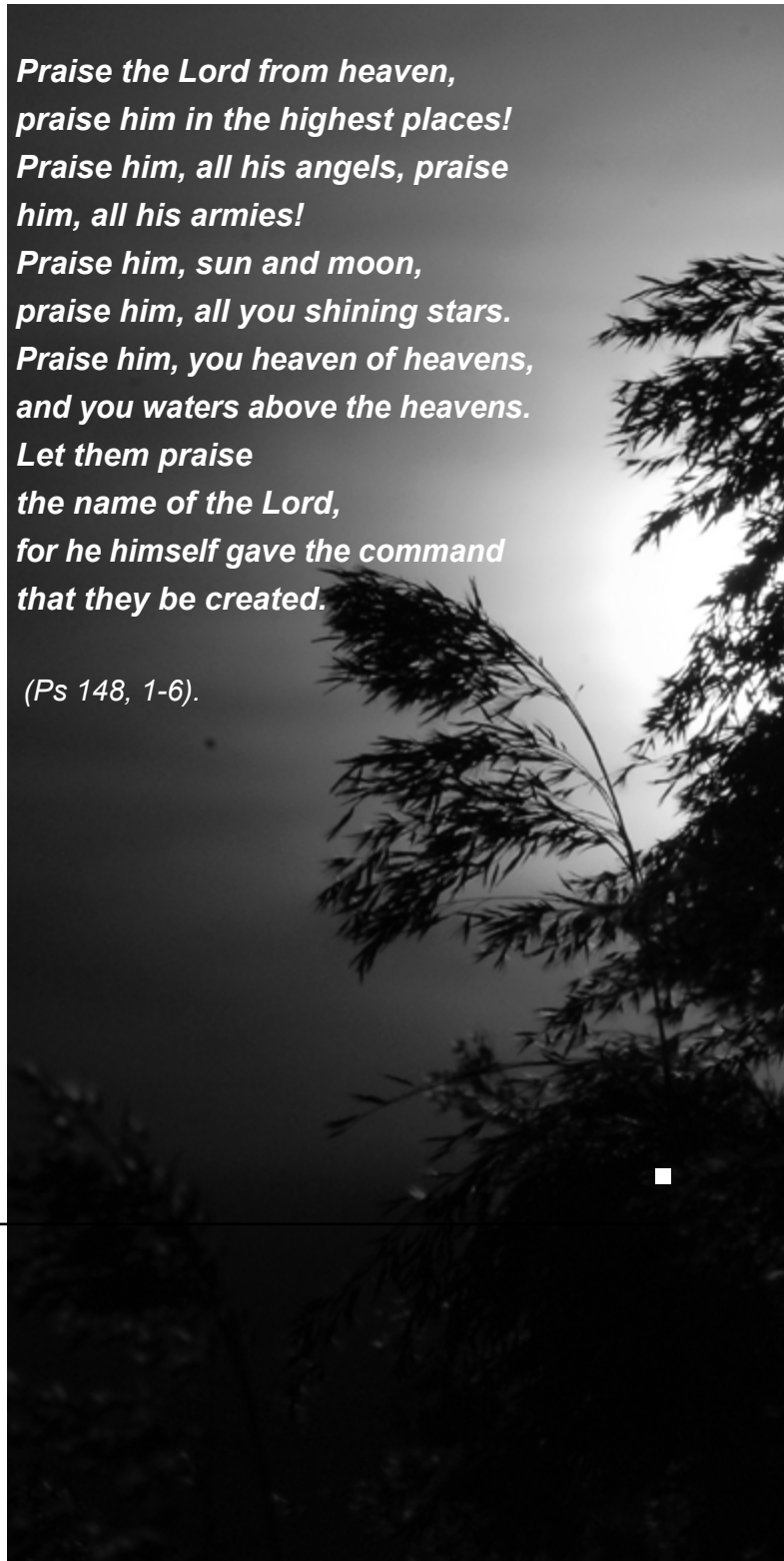
---

2. Francis of Assisi, Canticle of the Sun, in: The Writings of Saint Francis of Assisi. Latin and Old Italian texts in Polish translation, Kraków 2009, pp. 237-239.
3. The book was published in Germany in 1985. A translation into Polish was published ten years later.
4. J. Moltmann, God in Creation, transl. Z. Danielewicz, Krakow 1995, pp. 25-26.
5. Ibid., P. 487.

According to the creation account, the Creator completed his creation with the Sabbath day. God rested after all his works. With his "resting presence" he blessed the creation. God no longer acted, but was fully present. It is the Sabbath that is the true crown of creation, not man. (…) Through the Sabbath rest the creating God achieves His goal, and people who celebrate the Sabbath see nature as God's creation and allow the world to be God's creation[6].

Since the 1950s, similar reflections have appeared, to a lesser extent, in the Catholic Church. John XXIII, Paul VI, John Paul II and Benedict XVI remind us about the role of creation and the need to care for it in order to preserve its wealth for future generations. The same is done by Pope Francis who published the encyclical *Laudato si'* in 2015. The papal document has no addressees, or else: all people are its addressees. After all, everyone must care about a planet that is dying as a result of species extinctions, climate change, environmental damage and over-exploitation of natural resources. If It, the Earth, perishes, man will also perish. Taking action is an urgent and common matter. All nations and states must take appropriate and effective steps to guarantee the survival of the wealth of creation for future generations. Hence the Pope proposes an "integral ecology", i.e. an ecology of openness and delight, simple gestures „breaking the logic of violence, exploitation and selfishness"[7]. Integral ecology requires that we spend some time regaining peaceful harmony with creation, reflecting on our way of life and our ideals, contemplating the Creator who lives among us and in what surrounds us, whose presence, should not be produced, but discovered, revealed'[8].

The world created by God is a gift to man for which he is responsible. This gift must not be wasted or destroyed, but taken care of effectively. If for centuries Christianity has defended the goodness of creation, it is because it was created as good and participated as good in the history of salvation. God revealed himself in creation; he also showed his omnipotence in it. Ultimately in Christ, his beloved Son, God became man and assumed human nature. Although Christ's life ended with the Passion of the Cross, this was not the last word of God the Father. The morning of the day after the Sabbath brings joy in the resurrection in which a fragile creature like the human body participates. The new body of Christ is a sign and guarantee of the transformation of the material world, which, made divine, will share in God's glory. Then all creation will achieve its goal and will glorify its Creator as it is doing now already:



6. Ibid., P. 535.
7. Laudato si' 230.
8. Laudato si' 225.

Patron of Ecologists and his message

Father Stanisław Jaromi

In the fall of 2019, recalling St. Francis of Assisi, it is worth remembering that it is the 40th anniversary of his being proclaimed the patron saint of ecologists. This was done by St. John Paul II in the apostolic letter *Inter Sanctos* of November 29, 1979, proclaiming Brother Francis *oecologiae cultorum Patronum caelestem,* that is, the "heavenly patron of ecologists". This way the direction of Catholic ecological reflection was set. Trying to find an answer to the difficult challenges of today, the Church presents the message of the Gospel from a Franciscan perspective, and the thought and language of many projects of contemporary Popes is dominated by the message of Saint Francis of Assisi. This is clearly seen in the great social and ecological encyclical of Pope Francis, which begins with the words of the *Hymn for the Creation* by St. Francis.

The primary source of knowledge about St. Francis of Assisi (1182-1226) and his relationship with the natural world are the early Franciscan sources, i.e. his writings and documents concerning him and his brothers, written in the Franciscan environment immediately after the death of the founder. Already his first biographer, Brother Thomas of Celano, asked rhetorically: *Who could describe his extraordinary love for all God's creatures? Who would be able to express how much joy it brought him to notice the wisdom of God, power and goodness in the creatures?*

This attitude was the result of a long spiritual development. In his adolescence, together with the troubadours he was captivated by, Francis admired the beauty of nature. During his illness and his spiritual transformation, he saw that the world was a manifestation of God's goodness, created out of love, and arrived at his characteristic, positive, affirming relationship with creatures.

The classic texts that illustrate Francis' view of nature, deeply religious and full of love and fraternity, are his *Hymn of Creation*, the stories about the sermon to the birds and the reconciliation of the residents with the wolf in Gubbio. They testify to Brother Francis' cordial approach to nature, his genuine interest in the fate of animals and his concern that excludes any desire for domination or exploitation.

It is also worth recalling the recently found codex with the 13th-century biography of St. Francis of Assisi, which emphasises even more his brotherhood with all the creation. Its author sincerely admits that with the passage of time he comprehends and understands the message of Francis less and less, but his account includes even more profound experiences of poverty and the theme of brotherhood with all creation. He emphasises that *Francis loved his brother humans as well as animals, recognising them as sons of the same Creator*. As Silvia Guidi writes in L'Osservatore Romano of January 26-27, 2015, new aspects of St. Francis' life emerge from the past; this time not only fragments or quotations from works created in his time, but also a second, older biography of the saint from Assisi. The work belonged to a private collection that does not appear in library catalogs and was unknown. It is a small codex (of the size twelve by eight centimetres), its Latin version is nearly sixty pages long.

This book remained unnoticed for a long time, perhaps precisely because of its meagreness: it is a small "Franciscan code in the literal sense, simple and poor, without ornaments or miniatures", as explains the author of the discovery, the medievalist Jacques Dalarun from Paris. It contains a summary of the first version of the Legend of St. Francis, written between 1232 and 1239 by Brother Thomas of Celano, and considered by his contemporaries as too long. We also have new elements, and upon careful reading we can see that the author's reflection has deepened over time, especially on the issues of poverty and love for creatures. Brother Thomas was

a knowledgeable and insightful man and never stopped reflecting on the teachings of Francis. In a way, one could say that the biographer grasps over time... that he did not really understand the message of Francis. He told about it, but didn't really understand him. He emphasises the much more concrete nature of the experience of poverty, not in a symbolic or allegorical sense, but in a real sense: it means wearing the same clothes and eating the same meals as the poor.

The topic of brotherhood with all creation also deepens, when he writes that it applies also to beings without reason, not only to people. We are different, but we are brothers because we have our origin in the fatherhood of the Creator. *That is why* - emphasises Jacques Dalarun - *I do not agree when I hear that "Francis loved nature"; it should rather be said that "Francis loved his brothers humans as well as animals, recognising them as sons of the same Creator."*

In this perspective, we understand even better the words of St. John Paul II, who said that Saint Francis *deeply felt all the works of the Creator in a special way*, that is, he got to know the relationship between the Creator and His creation in full, and went through life in humble admiration for the Work of God the Creator.

It is not easy for the Church to go this way, but attempts are made. The most important of them is presented in the encyclical *Laudato si'*, signed by Pope Francis at Pentecost 2015. It begins with the words *Laudato si'*, mi, Signore - Praise be to you, my Lord. This is the beginning of the famous Hymn of Creation, written by St. Francis of Assisi several months before his death, wanting (despite losing his eyesight) to worship God together with all creation, which he calls "brothers" and "sisters", and the earth is called "mother". Even death is a "sister" and each fellow-being is a "sister" and "brother".

In his encyclical, the Holy Father explains who St. Francis of Assisi is for him. He says: *I think Francis is the supreme model of caring for what is weak, and the patron saint of an integral ecology lived with joy and authenticity. He is the patron saint of all those who carry out research and work in the field of ecology, loved also by many non-Christians. He showed a special sensitivity to God's creation and to the poorest and abandoned. He loved and was loved because of his joy, his generous sacrifice, his heart open to all existence. He was a mystic and a pilgrim who lived with simplicity and in great harmony with God, with other people, with nature and with himself. We see in him the extent to which concern for nature, justice for the poor, social commitment and interior peace are inextricably linked.* (LS 10)

St. Francis wanted us to see in God the Father of each of us and all of Creation. He also invited us to renew our relations with our fellow-beings and with all nature. The Pope invites us to

contemplate the creation, listen to its voices and recognise ourselves in relation with it. He writes: *God has written a wonderful book "the letters of which are the numerous creatures present in the universe". The bishops of Canada rightly said that no creature is beyond the revelation of God: "From the broadest panoramas to the smallest forms of life, nature is a constant source of wonder and reverence. It is also a continual revelation of divinity." The Japanese bishops, for their part, said something very suggestive: "Seeing all the creation, singing a hymn in honour of his existence is a joyful life in God's love and in hope.This contemplation of creation allows us to discover a certain lesson that God wants to give us through each and every thing, because 'for the believer, contemplating God's creation also means listening to the content of the message, listening to its mysterious and inaudible voice." We can say that: "Apart from the Revelation in the strict sense of the word, contained in the Holy Bible, God's revelation is also for us the brightness of the sun and the fall of night". By drawing attention to this revelation, man learns to recognise himself in relation to other creatures: "I express myself by expressing the world; I discover my sacredness by trying to decipher the sacredness of the world".* (LS 85)

The Church, therefore, embraces Franciscan ecological thinking and proclaims universal fraternity. Jacques Dalarun draws attention to the historical moment in which the testimony contained in the cited 13th-century biography emerged from the past. This happens at a time in history that has many elements in common with the great economic boom and many spheres of poverty in the 13th century, when we have Pope Francis and his message of love for creation.

Especially that - as the Pope notes in his letter for the World Day of Prayer for the Care of Creation on September 1, *2019 -Egoism and self-interest have turned creation, a place of encounter and sharing, into an arena of competition and conflict. In this way, the environment itself is endangered. Something good in God's eyes has become something to be exploited in human hands. Devastation has increased in recent decades: constant pollution, the continued use of fossil fuels, intensive agricultural exploitation and deforestation are causing global temperatures to rise above safe levels. The increase in the intensity and frequency of extreme weather phenomena and the desertification of the soil are causing immense hardship for the most vulnerable among us. Melting of glaciers, scarcity of water, neglect of water basins and the widespread presence of plastic and microplastics in the oceans are equally troubling, and testify to the urgent need for interventions that can no longer be postponed. We have caused a climate emergency that gravely threatens nature and life itself, including our own.*

Analysing the causes of this tragic situation, he again cites Franciscan sources and calls: *This is time to reflect on our lifestyles and the fact that our daily choices in terms of food, consumption, transportation, use of water, energy and many other material goods, can often be thoughtless and harmful... This is time for undertaking prophetic actions. Many young people all over the world are making their voices heard and calling for courageous decisions. They feel let down by too many unfulfilled promises, by commitments made and then ignored for selfish interests or out of expediency. The young remind us that the earth is not a possession to be squandered, but an inheritance to be handed down. They remind us that hope for tomorrow is not a noble sentiment, but a task calling for concrete actions here and now. We owe them real answers, not empty words, actions not illusions.*

The encyclical *Laudato si'* and the papal eco-messages give us a valuable synthesis on the main topics of ecology, nature conservation and climate protection, they also give a new perspective in ecological activity according to the principles of integral ecology. In many countries, it has become the key for Catholics to open up to ecology. Especially since they write about ecology in a different language than politicians, experts or activists. Finally, they provide a religious and spiritual perspective, showing concrete examples of both an ecological and Christian lifestyle. ■

The Sad Tropics?

Piotr Tryjanowski

The title deliberately, albeit without the question mark, refers to a well-known book by French anthropologist Claude Lévi-Strauss, published under this title. He included in it his reflections resulting from research on Native Brazilians, where he combined philosophy, sociology, literary theories, and even musical and geological motifs in the form of a diary.

For decades, his vision has affected the visions of humanists. Paradoxically, he did not see what we perceive as the essence of the tropics today. Namely, their phenomenal nature. It is paradoxical and sad at the same time. Lévi-Strauss wrote about his book that it was “A synthesis of what I have done up to this moment. That is everything I believed in or dreamt of. “Dreams of the tropics attracted many: adventurers, troublemakers, naturalists, fugitives and missionaries. All of them left some imprints, both good and bad. There were delights over tropical nature - its fabulous colours, shapes, sounds and smells. However, a deeper, scientific analysis was missing. References to the tropical world of nature appeared in geography and biology textbooks as a colorful curiosity. They provoked admiration of the “how-nice-it-is-there!” type. In fact, just that. Fortunately, only for a time.

Today, when travelling has become cheaper and safer, more and more people visit the tropics, not only absorbing their beauty, but also carrying out scientific projects, and often rubbing their eyes in amazement. But more on that in a moment. Over the last decades, the tropics have attracted researchers, especially from the countries formerly possessing colonies: Great Britain, France, Portugal, but also the Netherlands and Belgium. Hundreds of papers and reports have been written, mainly of an exploratory nature - a description of what, where and when can be seen or experienced. However, merely compiling lists of species and supplementing museums’ natural collections is far from enough. Over time, a broader reflection hit the minds that, in the tropics, many aspects of species biology and the dynamics of ecological processes look completely different. It surprised professionals and amateurs alike, and required the modification of textbook knowledge.

The absence of natural seasonality, the increased number of plant and animal species, the utterly unusual space management by humans meant that theories invented in the privacy of research aboratories and university rooms in rich countries with temperate climate had to be thoroughly corrected. And they are still being corrected, as the tropics are immersive and keep surprising with new facts. If only a naturalist possesses a broader perspective, and his eyes and ears are wide open, he will be quickly attracted and absorbed by the charm of the tropics. Even if you sometimes complain in the tropics about frustrating long rains, unbearable temperatures, long nights, and mercilessly remote supplies of fluids,

there is no question about it: a naturalist simply must see the tropics. And that's it!

One has to open up to aliens, to unpredictable situations and even to great tropical disappointments. I remember my first one. A brutal clash of dreams of the southern sky, known from the adventure books read at school, with the view overhead. It was a surprise to learn that the most famous constellation there, the Southern Cross, is just … a kite. However, under this sky there are still places where you can almost feel like a real 19th-century explorer. It is from the tropics that newly described species come. We know practically nothing about their biology. And this concerns not only insects or arachnids, but also fish and amphibians, Even birds and mammals are similarly mysterious.

When we make for the tropics, it is worth inviting local residents to talk about everyday life, but also about nature and science. For them, it is often a compliment, and an opportunity to learn new research methods and ... earn a few pennies, because the material contrast is enormous. The cooperation built on site is the only way, not only to meaningfully solve research problems, but also to effectively protect nature.

Scientists like challenges, and the tropics clearly favour them. Working in them is very interesting, because it's so unpredictable. You don't come here for a day or two, but for a minimum of a few weeks. Crew members and assistants live together like the crew of a ship - with all their virtues and vices.

It is here that we are surrounded by rich, seductive nature. We are exposed to weather that can thwart scientific plans in an hour, with tropical rain devastating an experimental system intricately built over days. No mobile phone coverage and frequent Internet cut offs help to catch up on unread books and more serious reflection.

The tropics also require us to refresh long-forgotten abilities like using a hammer, pickaxe or shovel, carrying equipment on your back, cooking, cleaning and planning purchases, organising your work, reflecting on your own fate, and on the strength of friendship and love. ■

Laudato si' powerfully crosses many barriers

Krzysztof Mączkowski

If we assume that ecology needs a new opening, where spiritual inspiration for environmental protection will be vital, the encyclical *Laudato si'* is its fundamental element.

The message of this encyclical has been discussed from the very beginning by various circles: ideological, religious and political. There are many emotions in these debates, many distortions and attempts to adapt the content to the theses assumed by the interlocutors.

I believe, however, that there is a consensus among the participants of this debate that this is the most courageous and fullest voice of the Church as it comes to environmental protection in a very broad perspective. And not as an expression of the Pope's adaptation to fashionable trends, but as a reminder of the eternal truth that protecting the environment is protecting the gift of life and God's creation.

The Pope leaves no illusion about this, and already in the first words he refers to the words of St. Francis:

Praise be to you, my Lord, through our Sister, Mother Earth, who sustains and governs us, and who produces various fruit with coloured flowers and herbs" and reminding that we ourselves are dust of the earth. Our very bodies are made up of her elements, we breathe her air and we receive life and refreshment from her waters.

Do we need a clearer relationship between man and the Earth?

However, the message of the encyclical is much broader, and enters deeper into the interconnection of faith with the need to protect our earthly home.

The Pope carefully reminds us - apart from the words already quoted - about the close ties between man and nature, and thus about the close ties between conservation of nature and protection of life. You cannot consider yourself a defender of life without respecting nature and the life associated with it, and vice versa. *The destruction of the human environment is extremely serious, not only because God has entrusted the world to us, men and women, but because human life is itself a gift which must be defended from various forms of debasement.*

The Pope directly admits that environmental destruction is a sin, and referring to Patriarch Bartholomew, he states: *"For human beings… to destroy the biological diversity of God's creation; for human beings to degrade the integrity of the earth by causing changes in its climate, by stripping the earth of its natural forests or destroying its wetlands; for human beings to contaminate the earth's waters, its land, its air, and its life – these are sins". For "to commit a crime against the natural world is a sin against ourselves and a sin against God".*

In speaking of sin, the Pope makes it clear that protecting the earth is protecting "our home". This is one of the main and dominant themes of the papal teaching expressed in the encyclical. By this, he wants to highlight even more the relationship of man with the environment. After all, nobody normal destroys their home and its immediate surroundings. It is a very beautiful symbol and an extremely clear message.

The encyclical is, on the one hand, the "internal regulation" of Christianity on environmental protection, but, on the other, an appeal addressed to all world communities, to all religions and cultures. In a beautiful and expressive way, the Pope - referring to the accomplishments of St. Francis - makes an urgent call to take up the dialogue on building the future of our planet: *Regrettably, many efforts to seek concrete solutions to the environmental crisis have proved ineffective, not only because of powerful opposition but also because of a more general lack of interest.*

Therefore, not only the denial of the crisis, not only the environmental ravages, but also ignorance is an equally grave fault of our generations. If we have a look at the slogans of the youth climate strikes today, we will notice the accusation of idleness to be one of the main allegations of the young generation towards their contemporaries.

If we approach nature and the environment without this openness to awe and wonder, if we no longer speak the language of fraternity and beauty in our relationship with the world, our attitude will be that of masters, consumers, ruthless exploiters, unable to set limits on their immediate needs. By contrast, if we feel intimately united with all that exists, then sobriety and care will well up spontaneously.

The Pope calls for the courage to transform what is happening in the world into personal suffering. For there is no alternative world, there is no planet B, there is one Earth, our home, God's creation. He urges us to treat with the same care what is happening on the Earth and as what is happening in our homes, in our communities, among our loved ones.

What a brave appeal in the times when humanity does not consider environmental issues to be its own, but to "happen far away". All of these issues are well known to naturalists dealing with environmental protection. The Pope in his writings about environmental issues does not focus on anything new, anything that would surprise us, people dealing with environmental science.

With great acclaim, I note the extremely wide scope of issues raised in the encyclical: from water and air protection, through biodiversity preservation, noise prevention, land degradation, to uncontrolled city sprawls, building gated housing estates, spatial chaos, energy waste.

The power of the papal message is not about being novel, but about emphatically stating we have no right to destroy life on the earth, to devastate and degrade the resources of nature: *Each year sees the disappearance of thousands of plant and animal species which we will never know, which our children will never see, because they have been lost for ever. The great majority become extinct for reasons related to human activity. Because of us, thousands of species will no longer give glory to God by their very existence, nor convey their message to us.*

The Pope condemns not only devastating environmental damage, but also apparent actions undertaken to merely make an impression: *It is remarkable how weak international political responses have been. The failure of global summits on the environment make it plain that our politics are subject to technology and finance. There are too many special interests, and economic interests easily end up trumping the common good and manipulating information so that their own plans will not be affected.* He urges that the interests of economic groups *" irrationally demolish sources of life"* (according to the Aparecida Document of June 29, 2007, 5th Latin American and Caribean Episcopal Conference)

The Pope in a loud voice repeats the concerns expressed by scientists and analysts: it is foreseeable that, once certain resources have been depleted, the scene will be set for new wars, albeit under the guise of noble claims. With wars comes new damage and suffering. But politicians must pay greater attention to foreseeing new conflicts and addressing the causes which can lead to them.

The revolutionary nature of the *Laudato si'* message is that it fundamentally changes the meaning of the biblical call to humans to "have dominion over the earth." He directly questions the wrong, in his opinion, interpretation of this fragment of Scripture.

He writes about the three relations that constitute human presence on the Earth: relations with God, with other people and with the earth. Each of them has been torn apart, the harmony has been disturbed, or even disrupted *by our presuming to take the place of God and refusing to acknowledge our creaturely limitations. This in turn distorted our mandate to "have dominion" over the earth" and to "till it and keep it" .*

And he intimates: *We are not God. The earth was here before us and it has been given to us. This allows us to respond to the charge that Judaeo-Christian thinking, on the basis of the Genesis account which grants man "dominion" over the earth (cf. Gen 1:28), has encouraged the unbridled exploitation of nature by painting him as domineering and destructive by nature. This is not a correct interpretation of the Bible as understood by the Church. Although it is true that we Christians have at times incorrectly interpreted the Scriptures, nowadays we must forcefully reject the notion that our being created in God's image and given dominion over the earth justifies absolute domination over other creatures. The biblical texts are to be read in their context, with an appropriate hermeneutic, recognising that they tell us to "till and keep" the garden of the world (cf. Gen 2:15). "Tilling" refers to cultivating, ploughing or working, while "keeping" means caring, protecting, overseeing and preserving. This implies a relationship of mutual responsibility between human beings and nature. Each community can take from the bounty of the earth whatever it needs for subsistence, but it also has the duty to protect the earth and to ensure its fruitfulness for coming generations.*

It is a crucial fragment, perhaps the most important in the entire encyclical: to stop the evil meanings of the call, which has often been an excuse and an invitation to destroy the environment. It has been a bone of contention thrown in between two worlds, the world of Christianity and of "the rest of the world". And its essence was an approach towards nature. But it is also an "inner commandment", thanks to which no Christian believer can speak of an alleged consent to environmental destruction any more.

Even more so, the Pope recalls the provisions of the Catholic Church catechism questioning the devastation of nature: *Each creature possesses its own particular goodness and perfection… Each of the various creatures, willed in its own being, reflects in its own way a ray of God's infinite wisdom and goodness. Man must therefore respect the particular goodness of every creature, to avoid any disordered use of things".*

Christian ecologists are given a serious weapon to change environmental awareness of their brothers in faith, they are given a powerful weapon to defend their Christian and, at the same time, ecological way of thinking.

Each chapter of the encyclical is extremely weighty, important and has its specific gravity, but this one may definitely adjudicate the dispute that weighed on the relations of the Church with other communities, and of other communities with the Church. The Church, in this case, was treated as a natural enemy to pro-ecological circles. The Pope did not question anything, did not withdraw from anything, but gave this thought its proper meaning and restored it to its rightful place in considering the relationship between man and nature.

I would very much like - and I suspect there are many of us - general shift in thinking about environmental issues to happen in the reflections of the Church. So that the friends and enemies of the Earth would not be classified as believers and non-believers, would not be assigned to various denominations, but would be considered wise or simply stupid.

It is also important that the Pope warns against a fragmentary perception of reality, and prompts us to apply a broad, long-term view. He encourages us to find links between social, political, economic, environmental and even cultural issues: Ecological culture cannot be reduced to a series of urgent and partial responses to the immediate problems of pollution, environmental decay and the depletion of natural resources. There needs to be a distinctive way of looking at things, a way of thinking, policies, an educational programme, a lifestyle and a spirituality which together generate resistance to the assault of the technocratic paradigm.

The opposite view means the failure of all ecological undertakings, because *otherwise, even the best ecological initiatives can find themselves caught up in the same globalised logic.*

To detach oneself from the philosophy of ecological culture means to separate what is in reality interconnected and to mask the true and deepest problems of the global system.

The Pope therefore states the need for a radical rebuilding of the lifestyle based on already known and generally recognised values.

Men cannot change their habits without changing their bad relations with people and humanity. Our relations with the world are not able to change, and we will not be able to find our mission in environmental protection if we do not overcome our internal ethical and cultural crisis. A change of our mentality, greater sensitivity and humility are fundamental here. *If the present ecological crisis is one small sign of the ethical, cultural and spiritual crisis of modernity, we cannot presume to heal our relationship with nature and the environment without healing all fundamental human relationships.*

The papal equation of environmental degradation and the ruthless abuse of children together with the ruthlessness of economic exploitation is extremely poignant.

In the absence of objective truths or sound principles other than the satisfaction of our own desires and immediate needs, what limits can be placed on human trafficking, organised crime, the drug trade, commerce in blood diamonds and the fur of endangered species? Is it not the same relativistic logic which justifies buying the organs of the poor for resale or use in experimentation, or eliminating children because they are not what their parents wanted? This same "use and throw away" logic generates so much waste, because of the disordered desire to consume more than what is really necessary.

Please excuse the many quotes. In fact, one could include many more here, indeed, rewrite the whole encyclical here with the advice to read it all. Truly, we are facing an extraordinary document. Not only is it a comprehensive and accurate diagnosis of social and economic phenomena aimed at the Earth's degradation, not only is it a discussion of environmental issues and their threats, but also - or perhaps primarily - it is a call to action for the environment, to heal relations among men and by doing so to improve human-environment relations.

The call to build a new global and local policy is also a call to incorporate religion with the respect for life it advocates into the dialogue with science, and to include culture in the decision-making concerning the environment.

As I remember, different emotions characterised the global public debate at the time of the encyclical's publication five years ago: disbelief, doubts about the sincerity of the head of the Church's intentions. Today, other emotions fill the debate on the environment and the Earth, where mankind is exposed to the increasingly negative effects of its activities on the globe every month. These few years have made a huge difference: there were no youth climate strikes then, there was not as much public interest in political decisions on environmental protection as there is today. There was no such worldwide expectation of a moral, cultural breakthrough in human awareness.

Today *Laudato si'* becomes an even stronger moral weapon to fight for a better tomorrow, for a better future for generations to come. The universalism of the message is about it being derived from and based on Christianity, but at the same time resonating with similar messages from other denominations of the world, other Churches, other religions and sets of beliefs. It may certainly arouse criticism of this encyclical in some, but for others it is a good reason to defend it.

These public disputes are well known to us today and there is no need to refer to them and arous unnecessary emotions. All the more so because this magazine is intended to build bridges between different philosophies which show respect for the Earth and for all life.

Still, no-one can deny that *the rich heritage of Christian spirituality, the fruit of twenty centuries of personal and communal experience, has a precious contribution to make to the renewal of humanity.*

Where is the community? For instance here, where the Pope states that the *ecological crisis is also a summons a to profound internal conversion.*

And for instance here, where the Pope reminds that *various convictions of our faith, developed at the beginning of this Encyclical can help us to enrich the meaning of this conversion.These include the awareness that each creature reflects something of God […] Then too, there is the recognition that God created the world, writing into it an order and a dynamism that human beings have no right to ignore.*

The Pope encourages us to let *the power and the light of the grace we have received also be evident in our relationship to other creatures and to the world around us. In this way, we will help nurture that sublime fraternity with all creation which Saint Francis of Assisi so radiantly embodied.*

Environmental protection includes large big scale activities as well as simple everyday gestures: *Christian spirituality proposes a growth marked by moderation and the capacity to be happy with little. It is a return to that simplicity which allows us to stop and appreciate the small things, to be grateful for the opportunities which life affords us, to be spiritually detached from what we possess, and not to succumb to sadness for what we lack.*

Truly, you need to be full of bad will to underestimate the role of Laudato Si to correct this wrongful man-to-man and man-to-nature relationship, something which can bring a fundamentally positive change for the environment. I can hardly understand how insensitive one must be to refute these arguments, when the Pope cites - extremely accurately - all the examples of environmental degradation and writes in simple words about our human obligations. I do not know how blind one needs to be to the wisdom of this message so as not to accept the teaching that goes far beyond the rigid framework of procedures and rules, and releases energy and enthusiasm to do good.

The Pope does not divide by this encyclical, on the contrary - he reminds us of the community of good. He says that just as when we approach nature we do not move away from God, so when we approach God we do not move away from nature.

It is a new language in the Church. Although only five years have passed since *Laudato Si's* publication, in the present day reality it is a huge progression in identifying the challenges and problems and making new types of answers to all of them.

Frankly, considering what I have experienced over that time, I can hardly imagine the first half of the 21st century without this encyclical. ■

“I Do Not Waste Food”

Agata Wójcik

Several decades ago, housewives in Poland used to make a leaven for a cake called “A Friend”. The leaven had to be divided into several parts. One would be left for the housewife who originally made it, and the rest had to be shared among relatives. The leaven was left to grow in a warm place for several days. The whole family eagerly waited for the delicacy unavailable in any store. Nowadays, our culture promotes products you can get quickly. Food, not always healthy, is at your fingertips. Everything can be bought without a problem, often at a very low price. The rule is “consume quickly, dispose of the leftovers and packaging”... not considering the real cost of what lands on our plate.

With such food availability, paradoxically many Poles today live on the brink of poverty. However, in many families, sharing a meal with others and respect shown to food still remains a value passed down from generation to generation. Despite such due respect for food, cultivated by generations, we can observe, both in Poland and elsewhere in the world, that food wasting is not a myth. Rather, It is a painful “taboo”, especially in those countries where food is easily accessible.

Food wasting according to the “I Do Not Waste Food” Report (2018).

According to a report published in 2018 by the Federation of Polish Food Banks (Federacja Polskich Banków Żywności, FPBŻ), we still waste a lot of food. A survey conducted by Kantar Millward Brown commissioned by the FPBŻ shows that as many as 42% of Poles admitted to throwing away food. The study showed that as many as 35% of people throw away food several times a month. The most common reason was overlooking a product’s expiry date, followed by excessive shopping. Other reasons given by the respondents were the purchase of poor-quality products and too large portions of meals. The respondents also justified throwing away food with its improper storage, with having a vague idea what to do with the products, and doing shopping without a list. According to the above report, bread is most often disposed of, followed by fruit, meat, vegetables, yoghurts and potatoes.

The amount of food wasted has changed over the years. This can be attributed to the economic situation, various dietary trends, as well as to the increased awareness of the impact of a healthy diet on the human body. According to the previous decade’s data, in Poland about 253 kg of food per person is wasted each year. It is no secret that wasting food adversely affects the environment. The data shows that one ton of wasted food produces as many as 4 tons of CO^2. Food waste results in greenhouse gas emissions, as well as wasting water and electricity.

A way to improve things

Public awareness of eco food, healthy diets and the impact of our diet on the environment is still very low. However, more and more grass-root initiatives arise that not only educate, but stimulate practical actions.

There are many ways to deal with food waste:
- making a shopping list
- buying less
- planning the menu for a few days in advance
- learning low/ zero waste cuisine, i.e. processing food in a way not to waste it
- sharing excess food with those in need.
- if possible, buying in bio and eco food stores, as well as food cooperatives.
- cheaper is not always better; it is worth reading the labels to consider how the product will affect your physical and mental well-being (yes, food also affects the psyche).
- make eating a meal with others a celebration, a way to establish relationship with people.

Maybe it is worth restoring old time customs like the “Friend” cake, at least on festive occasions?

When Christmas is over ...

Christmas in Poland means a table rich in cuisine and consuming plentiful food, washed down with alcohol, for a couple of days. Preceded by standing in long lines in shops to buy enough, or more, for fear we will run out of food before Christmas is over. However, sometimes, even after very abundant feasts, quite a lot of supplies remain uneaten. In such a situation, the "Share your meal" (Podzielmysie.pl) charity will help. After completing the form on their website, a volunteer will come to pick up food on the appointed day. The food will reach the homeless and the poor. The only difficulty is ... to think about it in advance.

The "Foodsharing Polska" initiative is here to help, too. In larger towns, in specially designated places, there are refrigerators to which you can deliver food. Food can be left here not only at Christmas time, but throughout the year. "Freeganism, dumpster diving, food sharing" or "I will give for free" groups present on Facebook do similar things nationwide or locally. In a big city like Warsaw, which is stereotypically considered prosperous, there are a lot of people in need. They react instantly to new posts on food sharing.

Take a plastic bag, *it's free after all!*

I can tell those people who would take a plastic bag in a shop that - in fact - it is not free. We all pay for it - with water and air pollution. A funny (?) meme circulates on the Internet depicting a consumer who, when buying a fish, asks the seller to get him a plastic bag. The latter suggests that the customer takes the bag out of the fish's mouth. I suggest that everybody interested finds an answer to the question: how long does a regular plastic bag, which we get in a supermarket "for free", take to decompose? For your convenience, the answer is here: a minimum of one hundred years.

Through the eye of a psychodietici

Food waste is not only the effect of the ignorance of consumers, bad law and poor-quality products. Another side to the problem, virtually unnoticed so far, are mental diseases related to anorexia. Loss of appetite, or anorexia, can be triggered by certain medications, e.g. from the SSRI group applied to treat depression and anxiety disorders.

A vicious circle arises: I buy food because I have to eat - I can't bring myself to eat it, so I leave it - I waste - I feel guilty ... and I'm depressed even more. It is not only teenagers, but also younger and younger children, who organise themselves into groups of the so-called "pro-ana" lifestyle, which promotes practising anorexia-like behaviours. It involves throwing food away, too. In this case, sick people can become so "skilled", it is unnoticed by their relatives. Unfortunately, mental illnesses are still a "taboo" in our country.

What can be done

Planning shopping, mindfulness in eating, caring for the needs of others - this is what everyone can do. It is worth considering already today what I can do to make the life of future generations better. ■

Sources:

https://bankizywnosci.pl/wp-content/uploads/2018/10/Przewodnik-do-Raportu_FPB-Z_-Nie-marnuj-jedzenia-2018.pdf

http://podzielmysie.pl/my/

THE POLISH EPISCOPATE'S PASTORAL LETTER ON ENVIRONMENTAL PROTECTION of 2 May, 1989

LETTER THEMES

The sense of threat that is being increasingly felt today as a result of the devastation of the environment in which we live, raises widespread concern. The Church is always deeply interested in human affairs, and more so, it wishes to be directly engaged in them. The anxiety of man is the anxiety of the Church. This is what prompts us today to raise the complex and difficult issue of ecology.

We address our pastoral word to believers and all people of good will, because the matter concerns us all and it is of extreme importance and urgency. It is important, because it relates to the very foundations of our existence, our Polish home, as well as our health and life. It is urgent, because there are dangerous cracks appearing in this plane which in consequence may lead to the destruction of the very bases of our nation's existence. Some people even speak of a crisis or an ecological disaster.

THE ECOLOGICAL SITUATION OF POLAND

According to official data, 27 regions of Poland have been identified as environmentally at risk. Those regions constitute the area of 35,200 km2 and they are inhabited by 12.9 million people, i.e. 1⁄3 of the Nation. Let us mention here just a few: the region of Legnica and Głogów, Bełchatów, Gdańsk, Kraków, Tarnobrzeg and others. It should be highlighted that the most difficult situation prevails in the Upper Silesian Industrial District, where 8.1% of people exposed to poisonous fumes of concentrated industry inhabit a small area, constituting only 1% of the whole country. Inhabitants of this region, especially children, show an increased tendency to suffer from diseases or premature death. Rapid exploitation of coal is leading to the collapse of entire cities. This is a situation which is unique on a global scale. It must be added that the alarming environmental conditions in Silesia affects the whole country.

The poor condition of the environment in Poland is caused by air, water and soil pollution. As a result, forests are dying, and national parks are perishing. Many spas are losing their character as health resorts for regenerating human strength. We are losing the Baltic coast and the lake regions, i.e. places for recreation and rest. Monuments of the national culture, with historical Krakow at the forefront, are deteriorating. The landscape is littered by random architectural solutions. The majority of food produced fails to meet the required quality standards. The water deficit is being increasingly felt.

The above are the merely identified threats endangering humanity, endangering the human basic right to live in a healthy environment.

THE MORAL DIMENSION OF THE PROBLEM

Each form of human activity as the activity of a responsible being, has a moral dimension. Degradation of the environment affects the good of creation given to man by God the Creator as an indispensable element of his life and development. There is a duty to use this gift properly with a spirit of gratitude and respect. On the other hand, the awareness that this gift is intended for all people is a common good, and it also gives rise to an obligation towards others. Therefore, it must be recognised that all actions that do not take into account God's right to his work, as well as the rights of man endowed by the Creator, are contrary to the commandment of love. The deeply moral dimension of the issue is revealed here, and the factual situation presented above means we judge human actions in terms of guilt. It is, therefore, necessary to realise that our consciences are burdened with a grave sin against the natural environment, making us accountable towards God the Creator.

SOURCES OF EVIL

In order to remedy the situation, it is necessary to get to the roots of evil. They can be traced back to man himself and to the sinful structures of which he is the creator. It is worth referring here to the teaching contained in the encyclical "Solicitudo rei socialis" of the Holy Father, John Paul II. The Pope points out that ,among the actions and attitudes opposed to the will of God, the good

of fellow-being and the "structures" created by them, two seem to be very typical these days: on the one hand, the all-consuming desire for profit, and on the other, the thirst for power, with the intention of imposing one's will upon others and, as he adds, doing so 'at all costs.' (No. 37). It is that very attitude focused on possessing more and more goods that evokes in man a selfishness contrary to love, and leads to neglecting the rights or needs of others. It seems quite evident that with such an attitude, the spiritual aspect of man is lost, and material goods are practically considered to be the only goods.

Economic activities, often inspired by political or ideological motives, have resulted in the fact that the present economic model of Poland is not suited to the natural conditions of our country. The ill-considered construction of giant industrial centres caused an immense burden for an environment that is not able to cope with it. Production at any cost has become the guiding principle. And even if the motives behind such initiatives were noble, it was the human reason which failed, by ignoring the truth that when the environment is heavily burdened, the negative effects will outweigh the intended good. The imposed economic and social structures paralysing society's activities have led to the situation in which that society is unable to take effective action even in the area of rescuing the endangered environment. At the same time, the irrational exploitation of our raw material resources and their wasteful economy do not seem to take into account the needs of future generations.

How true seem the words of the already quoted encyclical: "hidden behind certain decisions, apparently inspired only by economic or political reasons, are real forms of idolatrous worship: of money, ideology, class, technology" (No. 37).

CIRCLES OF RESPONSIBILITY

All this indicates that we are dealing with a serious moral problem that requires internal transformation. Its essentiality should be acknowledged also by those who do not act according to religious motivation.

Responsibility for the state of the environment rests on the whole society and on all organs of power, and the degree of this responsibility is defined by the possibilities of undertaking action on the part of each body or social group, i.e., on individuals.

The Church also takes upon itself this responsibility by fulfilling the mission of proclaiming moral principles and by educating personal consciences in this respect. The Church refers back to its historical tradition, reminding of such great figures as St. Francis of Assisi, for whom all animate and inanimate elements of nature were more like brothers and sisters than a thing or being that could be freely used.

A deep sense of respect for all creation, behind which the Saint could discern God the Creator, constitutes a thoroughly ethical value that is worth imitating today. In the breve *"Inter sanctos",* proclaiming St. Francis the patron saint of ecologists, the Holy Father John Paul II says: "Among the holy and admirable men who have revered nature as a wonderful gift of God to the human race, St. Francis of Assisi deserves special consideration, for he, in a special way, deeply sensed the universal works of the Creator and, filled with a certain divine spirit, sang that very beautiful "Canticle of the Creatures" through which, especially Brother Sun, Brother Moon and Sisters the stars of heaven, he offered fitting praise, glory, honour and all blessing to the most high, all-powerful, good Lord...".

TOWARDS A BETTER FUTURE

The alarming ecological situation should prompt us to undertake a national examination of conscience and revision of life. It is only through recognising evil and acknowledging the guilt that proper action can be initiated. We face the necessity of changing our ecological thinking and actions, of 'transformation of consciences' – as the Holy Father put it, in order to behave more concertedly both towards man and nature. This internal transformation can prepare the ground for sacrifices that are essential to improve the ecological situation.

Each country has its own ecological conditionings as well as its own historical experiences on the path of development. The direction of economic development that Poland has chosen does not

harmonise with its natural conditions. Therefore, it is necessary to appeal for the right directions of development, which requires changing the industrial variant of the country's development and abandoning further development of heavy industry. It is this industry that by being highly energy-intensive, consumes huge amounts of natural resources and imposes the greatest burden on the environment. The existing industry must be brought, by all accessible and extraordinary measures, to a state in which natural resources are exploited in a safe and economical way. Otherwise, it should be rigorously eliminated.

In view of the emergence of nuclear energy, we must once again carefully consider whether it is really indispensable for us, and, most importantly, whether we are able to master this technology in such a way as to protect the country from the risk of potential contamination known to us from the recent past. The public's fears and protests in this matter deserve the full attention and respect of the authorities, as well as a real dialogue characterised by concern for the future, the general good and security.

It is also important to treat all economic entities having their share in environmental pollution on equal terms. If a different policy of enforcing environmental protection principles towards small and private businesses than towards large state enterprises is adopted, it gives rise to a sense of social injustice.

Polluters should be obliged to use environmental protection devices and the authorities should consistently enforce the commitments or apply criminal sanctions towards them. On the other hand, business facilities of high and irremovable noxiousness should be consistently and decisively liquidated. At the same time, new investments should become the subject of expertise of specialists who in a matter-of-fact and free manner give the appropriate assessment.

The Church also wishes to take a stance on the well-known fact that ecological problems in Europe have become a common matter of states and nations, since the atmospheric and water pollution is spreading beyond all borders. The south-western region of Poland has been contaminated by the activities of our southern and western neighbours, rather than by domestic industry. Therefore, it seems expedient to ensure that adequate international agreements are signed to protect our country against pollution.

The Church calls for effective international cooperation to combat this evil and is ready to support such cooperation with its authority and, where possible, also with practical action.

New ecological thinking should permeate the activity of all management levels and organisation of the economy, from workers operating the simplest devices or entering the construction site, through to company management, to the bodies that decide on further development directions.

CONCLUSION

We share with you, Brothers and Sisters, our concerns caused by the bad ecological situation. We appeal to all those responsible for the state of the environment to act in the name of the common good and make decisions which might stop the dramatic process of nature's degradation and initiate its gradual reconstruction.

However, we can all make efforts within the so-called "small ecology". All of us can decide individually in what condition we will leave the places of rest, whether it will be necessary to undertake initiatives to collect garbage in the mountains and forests.

Raise your children from an early age to respect nature, teach them to discover the beauty that God has encapsulated in it. Take care of the greenery around your houses and apartments, protect it from vandals that destroy everything green. Poland cannot become one big dustbin. There is beauty in it that needs to be discovered and protected.

We cordially bless all those who work to protect and properly shape the environment, our common motherly good. ■

Signed by:
Cardinals, archbishops and bishops present at the 234th Plenary Assembly of the Polish Bishops' Conference

31 years from the memorable Letter

Krzysztof Mączkowski

More than thirty years have passed since the publication of this pastoral letter of the Polish Episcopate. It was signed by bishops and archbishops just before the memorable Polish parliamentary elections on June 4, 1989. This coincidence might have been the reason for its message to be placed somewhat on the margin of Polish problems. Back then, something else was important, although from today's perspective it is surprising that environmental issues were so ignored.

Its prospective reader will be amazed many times - by the wide range of arguments, its beady look, courage in formulating thoughts and a kind of prophecy regarding matters that are considered "normal" today. Oh yes, while reading these reflections (see the Letter published in the current issue of The Francis' Tree magazine) many of us will probably shrug our shoulders and state that it is, after all, nothing new. But please remember that what has become a severely troublesome problem today, was not so evident thirty years ago.

The significance of the Letter's message lies in the fact that the authors link the values of nature to the values of Polish culture, which is scarcely imaginable and disregarded in many circles today: *The poor condition of the environment in Poland is caused by air, water and soil pollution. As a result, forests are dying, and national parks are perishing. Many spas are losing their character of health resorts regenerating human strength. We are losing the Baltic coast and the lake regions, i.e. places for recreation and rest. Monuments of national culture with historical Krakow at the forefront, are deteriorating. The landscape is littered by random architectural solutions. The majority of produced food fails to meet the required quality standards. A water deficit is being increasingly felt.*

The warning expressed by the bishops - thirty years ago! - sounds very memorable: environmental pollution harms man and his right to live in a healthy environment! The pollution is not only ecological in nature, but also moral: *Degradation of the environment affects the good of Creation given to man by God the Creator as an indispensable element of his life and development. There is a duty to use this gift properly with a spirit of gratitude and respect. On the other hand, the awareness that this gift is intended for all people as a common good, gives rise to a proper obligation towards another person.*

If, today, we hear about the "ecological sin" which causes disregard or sometimes hostility as over-ideologising Christian faith, then remember - it is nothing extravagant, already then the bishops wrote straightforwardly that *it is necessary to realise that our consciences are burdened with a grave sin against the natural environment making us accountable towards God the Creator.*
Oh, yes, it's a quote!

While formulating the thoughts contained in their Letter, the bishops referred to the economic and socio-political reality of the final days of the Polish People's Republic, tainted by communism, but - amazingly! - when one reads the recommendations of 1989, the topicality of certain matters is noticeable also today, although concerning different motivations and situations. What is the difference between *the ill-considered construction of giant industrial centres causing such an immense burden for the environment that it is not capable to cope with it* and current giant plans to regulate rivers and build new power investments of which it is already known that they will harm the environment?

How up-to-date the admonition that *production at any cost has become the guiding principle* sounds today... *And even if the motives behind such initiatives were noble, it was human reason which failed by ignoring the truth that when the environment is heavily burdened, the negative effects will outweigh the intended good!*

The bishops write about the economy imposed by a foreign system, which paralyses the environmental protection activities taken up by society. But today we are facing such activity of the state, which - admittedly - must take into account civic activity, but still forces solutions harmful to human health and life. This quotation from the Letter is also hardly out-dated:

How true seem the words of the already quoted encyclical: "hidden behind certain decisions, apparently inspired only by economic or political reasons, are real forms of idolatrous worship: of money, ideology, class, technology" (No. 37).

It is senseless to ignore the awareness of the fact that the poor condition of the environment – poor then and still poor today, for different reasons, though – is a major problem. An economic, political and moral one. No wonder various non-governmental, political, self-governmental, economical communities take action to to improve that state of affairs. I do not wonder, too, at religious communities activities, churches and organisations, though I feel sorry they are still scarce.

With joy, I read in the Letter of 1989 that a moral conversion requires a conversion in respect to these issues:

The Church also takes upon itself this responsibility by fulfilling the mission of proclaiming moral principles and by educating personal consciences in this respect. The Church refers back to its historical tradition, reminding of such great figures as St. Francis of Assisi, for whom all animate and inanimate elements of nature were more like brothers and sisters than a thing or being that could be freely used.
A deep sense of respect for all creation, behind which the Saint could discern God the Creator, constitutes a thoroughly ethical value that is worth imitating today. In the breve "Inter sanctos" proclaiming St. Francis the patron saint of ecologists, the Holy Father John Paul II says: "Among the holy and admirable men who have revered nature as a wonderful gift of God to the human race, St. Francis of Assisi deserves special consideration, for he, in a special way, deeply sensed the universal works of the Creator and, filled with a certain divine spirit, sang that very beautiful "Canticle of the Creatures' through which, especially Brother Sun, Brother Moon and Sisters the stars of heaven, he offered fitting praise, glory, honour and all blessing to the most high, all-powerful, good Lord...".

Bravo! But what next?

With great seriousness I read about the "national examination of conscience" in this matter, about the need to transfigure our conscience to become joint and several with maen and nature. With seriousness do I read about the internal transfiguration needed to cause sacrifices *that are inevitable to improve the ecological situation.*

Finally, with great attention I read the reminder of a simple principle that "great ecology" often starts with "little ecology":

All of us can decide individually in what condition we will leave the places of rest, whether it will be necessary to undertake initiatives to collect garbage in the mountains and forests. Raise your children from an early age to respect nature, teach them to discover the beauty that God has encapsulated in it. Take care of the greenery around your houses and apartments, protect it from vandals that destroy everything green. Poland cannot become one big dustbin. There is beauty in it that needs to be discovered and protected.

In the Episcopal Letter of 1989, I find everything that is missing from the message of today's Church. I find simple appeals and grave admonitions for us to remember that the Earth is a gift of Creation. In the bishops' thoughts of 1989, I find the courage to talk about difficult things and the courage to dun for consideration in action. I have a kind of impression that the Church of the early 21st century, apart from several praiseworthy exceptions, has abdicated from the obligation to talk about matters crucial to people in this respect. It is easiest to whine about ecology being overtaken by far-left political activists, it is far harder to carry out painstaking organic work in this area.

Contemporary generations know the encyclical *Laudato si'*, but then there was no such clear signpost ... So, I appreciate the acuity and very perceptive insight into important matters contained in the Letter.

I relish the fact that there are initiatives in Poland that – finally! - remind us of the initiative from thirty years ago. I myself learned about the Letter during the national conference organised by the Cardinal Stefan Wyszyński University (of Warsaw), St.Francis of Assisi Ecological Movement (Ruch Ekologiczny św.Franciszka z Asyżu, REFA) and The Global Catholic Climate Movement. This gives real hope that not all is yet lost... ■

Authors:

Assoc.Prof. Maria Drapikowska is employed at the Department of Ecology and Environmental Protection of the University of Life Sciences in Poznan as a specialist in the field of biology and ecology. She conducts research in the field of ecological and conservation genetics, including molecular and cytogenetic variability of taxa of plants that are dying out and are threatened with extinction. Currently, she is the initiator of research into modelling the distribution of invasive plants. Moreover, she conducts works in the area of crop plant protection and participates in the research of the team developing bioindication methods for atmospheric air pollution control.

Dariusz Grzybek, PhD, president of Zakłady Kórnickie Foundation, editor-in-chief of the Francis' Tree Magazine.

Jarosław Haładuda, teacher at Jan Kasprowicz Primary School No. 54 in Poznan, author of books and journalistic texts, ecologist, explorer.

Assoc.Prof. Andrzej M. Jagodziński, **Eng.**, forester and biologist. Professor and director of the Institute of Dendrology of the Polish Academy of Sciences in Kórnik, where he also manages the Laboratory of Ecology and professor at the Department of Hunting and Forest Protection at the Faculty of Forestry of the University of Life Sciences in Poznan. He is professionally involved in the analysis of factors determining biomass production and carbon retention in forests as well as in the analysis of ecological conditions of forest ecosystems biological diversity.

Stefan Jankowiak, professionally involved in the agricultural economy. Former director of Kórnik State Agricultural Farms Complex (PGR), then the manager and administrator at the Agricultural Property Agency of State Treasury (Agencja Własności Rolnej Skarbu Państwa). In the years 1995 - 2010, president of the state-owned company Jagrol sp. z o. o. with registered office in Pierzchno, and after the company was taken over by the TOP FARMS group - a member of the board. He considers the construction of retention reservoirs in the Struga Średzka Valley in Wielkopolska to be his greatest professional success.

Father **Stanisław Jaromi**, **PhD**, a Conventual Franciscan, doctor of philosophy, graduate of theology and environmental protection. He has been involved in Christian ecological education for years. A long-time delegate of the order for justice, peace and the protection of creation, chairman of the Francis of Assisi Environmental Movement Francis of Assisi (Polish REFA) and head of the website of Christian ecologists www.swietostworzenia.pl. He has worked in the Czech Republic and in international Franciscan centres in Assisi, Rome and Krakow.

Jakub Koczorowski, economist, graduate of the University of Economics in Poznan and of Warsaw School of Economics. From the beginning of his professional career, he has been associated with the REHAU company. Since 2008, he has been the Manager of the Renewable Energy Sources Product Group. In 2017, he took the position of Sales Manager in the Heating, installation and geothermal systems industry. In October 2018, he started working at Vaillant as a Manager for the Sales Development of Heat Pumps and RES (Polish OZE) for Eastern Europe. He has been a Speaker at conferences related to renewable energy sources, and a promoter of energy-efficient and passive constructions. Since 2015 – a member of the board of the Polish Organisation for the Development of Heat Pump Technology. He is the head of the commission of lower heat sources.

Jakub Kotnarowski, a graduate of Adam Mickiewicz University in Poznan. He also graduated from the "Challenges of Sustainable Development" course of the Sendzimir Foundation, AGH University of Science and Technology in Krakow and the University of Florida. He is a member of the Management Board of the Association of Eco-Development Promotion Centre in Poznan and local coordinator of the Glass Traps Foundation. He

initiated and carried out the “Birds in the City” and “Become an Urban Naturalist” programmes. Vice-chairman of the Civic Dialogue Committee at the Department of Environmental Protection of Poznan City Hall, representative in the Poznan Council for Public Benefit Activities from 2019.

Assoc.Prof. Piotr Kowalczak, Eng., specialist in the field of water management, especially in the areas of retention, water management in urban areas, flood protection, droughts, legal, economic and social aspects of water management. Long-term director of the branch of the Institute of Meteorology and Water Management in Poznan, and also a deputy director for Research of the Institute of Meteorology and Water Management in Warsaw and chairman of the Scientific Council of the Institute. In 2010-2014, he was the director of the Institute of Agricultural and Forest Environment of the Polish Academy of Sciences. Member of international bodies of water management, currently an advisor in the Senate of the Republic of Poland.

Piotr Kubiak, PhD, lecturer at Kirchliche Paedagogische Hochschule (Church Pedagogical University) in Vienna, coordinator of the PILGRIM association in Poland.

Krzysztof Mączkowski, environmental protection analyst, ecological educator, ornithologist, coordinator of the Francis’ Tree Program, secretary of the editorial office of the Francis’ Tree magazine, founder and director of the Run for the Earth.

Rev.Assoc.Prof.UAM Tomasz Nawracała, employee of the Faculty of Theology of Adam Mickiewicz University, lecturer in dogmatic theology.

Zofia Pawelska, Responsible for communications sat the WWF Poland, coordinates the WWF River Rangers program. A graduate of the Artes Liberales department at the University of Warsaw. Founder of the Lab Rescue initiative dealing with adoptions of laboratory animals and the Animal Studies scientific circle.

Assoc. Prof. Piotr Tryjanowski, director of the Institute of Zoology at the Faculty of Veterinary Medicine and Animal Science of the University of Life Sciences in Poznan; primarily teaches veterinary students - the basics of biology, parasitology and ethology. Interested in studying the behavior of wild animals.

Agata Wójcik, psycho-dietician, employee of the “Man in Need” foundation, social activist. ■

THE ZAKŁADY KÓRNICKIE FOUNDATION

The Foundation was established to realise the ideas of organic work that were nurtured by its Founders and their descendants.

The Zakłady Kórnickie Foundation (FZK) came into being thanks to the donation of Jadwiga Zamoyska née Działyńska and her son Władysław Zamoyski who donated their estate and fortune to the Polish Nation. Pursuant to the Parliamentary Act of 30 July 1925, the will of the donors was that the assets of the FZK should be indivisible and intended for the purposes described therein.

In 2001, when the Parliament (Sejm) of the Republic of Poland passed the act on the Foundation's restitution (it was not active after World War II), its mission was redefined and adapted to the reality of the turn of the century.

Currently, the goals pursued by the Foundation include, among others:

- supporting and developing modern agriculture, by spreading agricultural culture, education, valuable agrotechnological solutions and running model farms
- caring for agricultural education and academic re-search by running agricultural schools, promoting modern education and rational management of agri cultural resources, funding scholarships
- propagating organic work
- improving the living and workingconditions of residents on the Foundation's territory, supporting grass-root initiatives
- supporting the Polish Academy of Sciences (Polska Akademia Nauk) institutions based in the Foundation premises: the Kórnik Library and the Institute of Dendrology.

Apart from the Francis' Tree Programme, the Foundation carries out other projects.

ORGANIC WORK 2.0 COMPETITION

The Competition aims to increase the awareness of organic work among young people. It promotes pro-social attitudes and creativity. In 2020, it is emphasising enterprise.

The intention is to make young people learn the modern concept of organic work in the 21st century, to promote it and to redefine so that it meets contemporary needs, and to take up organic work actions in local communities.

This year's edition of the competition (2020) is dedicated to the memory of Count August Cieszkowski (1814-1894) an outstanding organic worker, philosopher and socio-political activist. This Wielkopolska citizen became famous as an economist, he was also considered a candidate for Minister of Finance of what was then Prussia. Count August Cieszkowski constitutes a model example of how to combine economic ideas with Christian social solidarity.

The Competition board encourages creativity and enterprise, and undertaking out-of-the box activities. Those interested, please read the terms and conditions on http://fzk.pl/projekty/praca-organiczna-2-0/

TYTUS

"Tytus" is a popular website on the history of Poland and of the world, including the Wielkopolska region. We hope to talk about history in a way which makes learning it a pleasure and generates the passion that we ourselves became infected with years ago. At the same time, we want our website to be a reliable source of knowledge, not sacrificing reliability for cheap sensation.

The name "Tytus" refers to Count Tytus Działyński (1796–1861), a Polish aristocrat, patriot, patron of the arts, founder of the Kórnik Library. He collected tens of thousands of books and manuscripts, often saving them from being looted. He deposited his priceless library and museum collections in the castle of Kórnik.

During Poland's partitions (when Poland was suppressed by foreign rule, and did not exist as a country in the map of Europe) this collection reminded us of the former glory of the Republic of Poland. Today, following the Count's intention, the Kórnik Library serves us all. "Tytus" is an extension of its patron's idea, transferring it to the 21st century.

History is still a key source of collective identity (local, national, European, human), building a sense of unity and inspiring to undertake collaborative action.

The website's admins strive for "Tytus" to serve as a public knowledge base about the past, helping readers find their place in the modern world and strengthening their bond with their homeland (both small and large), its culture and its other inhabitants.
Please visit: www.tytus.edu.pl. ■

THE FRANCIS' TREE COMPETITION 2020

WHAT IS IT ?

ECOLOGICAL EDUCATION OF CHILDREN AND YOUTH

- shaping ecological behaviors
- inspiration by the *Laudato si* encyclical
- influencing primary school communities across the country
- finding local ecology leaders

DRZEWO FRANCISZKA

CREATIVE PROJECTS

- educational programs
- radio broadcasts
- publications in the local press
- cooperation with the local press
- school research programs
- ecological festivities
- field actions
- and so on :)

TEAM WORK FOR ENVIRONMENTAL PROTECTION

- passionate enthusiastic teams
- involving local communities
- cooperation with local authorities and institutions
- ecological campaigns in the media
- teaching cooperation for a common good

PERMANENT CHANGE IN UNDERSTANDING ECOLOGY

- forming communities of local ecologists
- projects that last after the competition is over
- adults' opening up to children's ideas
- ecological campaigns in the media

ATTRACTIVE AWARDS

- at the local and national level of the competition
- for the best schools
- for all participants of the winning teams

MORE INFORMATION: WWW.FZK.PL/PROJEKTY/DRZEWO FRANCISZKA

THE FRANCIS' TREE COMPETITION 2020

HOW TO PARTICIPATE ?

STEP ONE: MAKE A TEAM

- up to 10 people
- pupils of grade 4 – 8 primary schools
- passionates full of enthusiasm
- the guardian

STEP TWO: MAKE UP A PROJECT

- be creative and courageous
- design cooperation with your community
- do something important

STEP THREE: SEND AN APPLICATION CARD

- before March 6, 2020
- post it by e-mail to a Regional Coordinator or by traditional post to Fundacja Zakłady Kórnickie
  al.Flensa 2B
  62-035 Kórnik

STEP FOUR: REALIZE THE PROJECT

- put your projects into effect
- popularize them within your community
- invite local authorities and the media
- send a report of the task
- wait for the Francis' Tree 2020 Final

DRZEWO FRANCISZKA

Patrons of the Francis' Tree Competition 2020

MINISTERSTWO KLIMATU

Ministerstwo Rozwoju

Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej

Partners of the Francis' Tree Program

Regionalna Dyrekcja Lasów Państwowych w Poznaniu

Regionalna Dyrekcja Lasów Państwowych w Pile

POWIAT POZNAŃSKI

TOP FARMS

wysoka jakość tektury falistej i opakowań

Międzynarodowe Targi Poznańskie

MINISTERSTWO ROLNICTWA I ROZWOJU WSI

EMAUS dobre radio

portal chrześcijańskich ekologów Święto Stworzenia

TVP 3 POZNAŃ

PRZEWODNIK KATOLICKI

Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej

Strategic Partner of the Francis' Tree Program