

FOREWORD

We hereby publish Volume 22 of the annual *Papers on Global Change IGBP*, which encompasses diverse subject matter relating to changes in the global environment. In this case, there are 8 scientific articles presented, as well as two Research Notes. The first article is in the nature of a report, containing as it does rather wide-ranging information on the results of a special meeting convened in Warsaw by the Ambassadors of the large European states of Germany, France, the United Kingdom of Great Britain and Northern Ireland and Poland, as invited by Head of the Polish Academy of Sciences **Prof. Michal Kleiber**, with a view to the causes and effects of global climate change being debated. Further participants in the discussion included the Intergovernmental Panel on Climate Change (IPCC) representatives with responsibilities connected with **Climate Change**, i.e. **Zbigniew W. Kundzewicz**, **Valérie Masson-Delmotte**, **Ulrich Cubasch**, **Jim Skea** and **Michal Kleiber**. These experts presented an assessment of rates of climate change globally, as well as their consequences and mitigations. Consideration was also given to opportunities for climate protection, in the context of a question as to whether things are in fact worse than expected. The issues of the causes and effects of climate change were thus raised, in regard to the problem's geophysical, economic and social dimensions.

A view is taken on similar matters in “Climate change research – what we need really?” by Indian scientist **P. Rama Chandra Prasad**. The focus here is on the philosophical relationship between climate changes and their consequences, as well as the comprehension of their real scale both among individuals and in society as a whole.

A further article by climatologists from India: **Manjunatha S. Tyalagadi**, **Alaka Gadgil**, **Gaddam Krishnakumar** (specifically Puna, Bengal) concerns the relationship between climatic warming and El Niño, and the monsoons whose appearance or failure determine the extents of regional droughts in India.

A further part of this volume is formed by a cohesive block of no fewer than seven Polish articles (all from Polish authors) dealing with the interrelationships characterising climate change, the agricultural landscape, forests, areas of planted trees, and belts of woody vegetation more generally. While broad, the treatment given to these subjects nevertheless serves to emphasise the key roles trees can play in the heat and water

balances in the environment, the cycling of elements, and the influence of the latter on the fertility of soils; as well as the benefits they offer when it comes to enhancing species diversity among plants and animals alike.

The ecological approaches to changes in ecosystem and landscape structure that the articles present relate to a host of Polish examples from rural and suburban areas, in the lowlands in particular. Attempts have been made to assess – in both quantitative and qualitative terms – the influence of changes in landscape structure on the cycling of water and energy in drainage basins utilised for agriculture. Field experiments and measurements have sought to determine the modifying role of changes in land use on climate change locally. The above results have also been used in the verification and calibration of mathematical models, and subsequently in forecasting.

The structure of areas planted with trees, and “transfers” from farmland to forest via tree planting and *vice versa* via deforestation for agriculture with various different crop structures, have also been analysed in line with examples from Poland.

Finally, a last article discusses the results of research into the energy efficiency of willows planted on wetlands, as regards the process of biomass combustion and the ambient levels and levels of emission of the greenhouse gases bringing about local and regional climate change.

The final part of the volume features reports from science events of relevance to the global change issue that have taken place in Poland recently. We very much encourage readers to familiarise themselves with these reports from the **IGU** Congress in Kraków and one national and two international conferences (Past Global Changes – **PAGES** and the **International Arctic Science Committee – IASC**) organised by scientific centres in Poland: Sosnowiec–Szczyrk, Gdańsk, Toruń and promoting the contribution of world and Polish science to research on global change in the terrestrial and paleo and contemporary polar dimension of environment, with reference also made to the further world **Programme Future of Earth**.

Prof. dr hab. Małgorzata Gutry-Korycka
Editor in Chief
Polish National Global Change Committee, PAS