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The Determinants of Human Well-Being in Sustainable Agriculture Policies: Reflections on the Book by Bazyli Czyżewski and Łukasz Kryszak, *Sustainable Agriculture Policies for Human Well-Being: Integrated Efficiency Approach*[*]

Determinanty dobrobytu człowieka w politykach zrównoważonego rolnictwa. Refleksje na temat książki autorstwa Bazylego Czyżewskiego i Łukasza Kryszaka, *Sustainable Agriculture Policies for Human Well-Being: Integrated Efficiency Approach*

The discussion concerning paradigms of industrial and sustainable agriculture in the search for an optimal development model of agriculture, combining its productive function with the multifunctionality of farms, ethical and social issues manifested in the assurance of food security and symbiosis with the environment, constitutes a major and topical trend in agricultural economics and economic policy. This results from several premises, among which priorities include the need to feed the ever-increasing global population and the maintenance of a stable level of agricultural income under growing environmental pressure and the impact of climate change. For many years a question has been posed as to whether the model

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* B. Czyżewski, Ł. Kryszak, *Sustainable Agriculture Policies for Human Well-Being: Integrated Efficiency Approach*, Springer Nature, Cham 2022, pp. 256. DOI:10.1007/978-3-031-09796-6. References and quotations in the text refer to this edition.

of agriculture assuring the balance of the three dimensions – economic, social and environmental – unequivocally justified ethically and based on solid theoretical foundations, is feasible and can be implemented in practice, whether the simultaneous realisation of the three above aspects is inevitably difficult or even impossible. The experience of many countries, including the largest agricultural producers such as the EU, the USA or China shows that in view of the above premises the transition from the model of industrial agriculture to sustainable agriculture is inevitable. Thus it leads to the issue of the effectiveness of any sustainable agriculture policy and its potential improvement. In relation to the first problem, we face a dilemma concerning methods to assess this effectiveness and the search for such a measure, which would provide a comprehensive rather than fragmentary estimation of the effectiveness of an agri-environmental policy considering all three dimensions of sustainability. Considering the improvement of effectiveness of a sustainable agriculture policy we can indicate several challenges related particularly to the necessary identification of key problems in the implementation of the concept of sustainable agriculture and the development of tailored solutions, determination of their main side effects in order to build a systemic solution that might mitigate the trade-offs and finally the creation of a coherent and internally complementary design of sustainable agriculture policy instruments for farming systems.

The book addresses all these problems and challenges, which makes it very interesting and valuable both for its scientific merit and applicability of its findings. It is one of the first (if not the truly first) studies that so comprehensively and insightfully discusses sustainable agriculture strategies – their genesis, structure, resulting dilemmas, approach to the measure of efficiency and attempts to improve it. This is an original, extensive and multi-faceted, cohesively and logically constructed study presenting the authors' novel concept of "integrated efficiency" and a slack-based effectiveness assessment of a public sustainable agriculture policy. Its empirical part is preceded by theoretical and review chapters devoted to the concept of sustainable agriculture, the effectiveness of public policies, and an up-to-date methodology for assessing it. Both the unique and valuable empirical research results and the theoretical part of the book constitute its unique contributions and added value. The latter is not just a simple literature review or even an attempt at ordering the current accomplishments in the field, but also a critical evaluation and an insightful scientific polemic, encouraging its readers to pursue further studies. This logically constructed argumentation not only provides readers with a comprehensive presentation of the problem, but also provokes them to pose further questions and search for new research directions in agricultural economics.

In evaluating the substantive merit of this book it may be indicated that the authors have formulated an important and current research problem, present

inspiring research questions and then consistently investigate the problem searching for answers to these questions. What is essential, they skilfully combine elements of the economic theory with the results of their original empirical studies using applicable analytical tools. The selection of research methods is properly justified and the empirical evidence is gathered using the proposed methodological approach as well as a multi-faceted interpretation of research results providing the basis for the formulation of conclusions and recommendations for application in practice. Obviously, the work is original and novel. Presenting a multidimensional (holistic) approach to the assessment of sustainable agriculture policy efficiency, the authors contribute to the development of the "eco-efficiency" concept and fill in the existing research gap by combining individual and collective (social) criteria through an environmentally and socially adjusted classical production function, which seeks the most efficient combination of agricultural production resources, output, socially desirable output, and undesirable output, and then assessing whether the target values meet the condition of not exceeding environmental capacity. The authors justify such an approach with reference to the Pareto-like improvement condition and indicating that: "the implementation of environmental and social goals will always be ineffective when it contradicts the Pareto-optimal allocation of resources. In other words, a reduction of an input can be accepted only if it fulfils the Pareto improvement condition, i.e. making a farmer better off in one aspect while the others remain at least unchanged" (p. vi). In addition, the authors not only aim to design an integrated efficiency measure to assess and compare its levels between countries globally, but they also to propose tailored solutions for agricultural policy.

Apart from the scientific and application value, the methodological part of this book deserves particular attention. In this respect, I refer not only to the novelty of the proposed method for measuring sustainable agriculture policy efficiency, but also its skilful and insightful presentation. The description of the research process confirms the authors' exceptional professionalism in the application of quantitative methods, at the same time as being easily comprehensible and clear. The transparent and coherent presentation makes it easy for all readers to understand the research process and the logic of the approach, while thanks to an appropriate selection of research results and clarity of their interpretation readers never feel confused or lost despite the abundant information provided. An exceptional value of this book is connected with the above transparency of the method, making it possible for interested readers to replicate the study. The authors have avoided the black-box syndrome, in which a set of inputs is entered and a set of outputs is obtained, while it is not clear how the analytical process of transforming the former into the latter was conducted. This scientific soundness and integrity is highly commendable.

In presenting more detailed remarks concerning the structure of this study I would like to focus on the structure of individual chapters and subchapters, of which each might constitute a separate study, comprehensible on its own. As far as necessary the authors provide an introduction to the subject matter of each chapter/subchapter, justifying its importance for the realisation of the planned research, explaining and justifying the logic of their approach, presenting a critical evaluation of the literature sources as a foundation for their own opinion, as well as interpreting (rather than simply reporting) research results in order to formulate general conclusions and present recommendations for the agri-environmental policy. Such a method of presentation obviously required considerable effort and consistency, but it provides readers with the benefit of following the authors' line of reasoning at any stage of analysis, with no loss of any significant points or issues.

The main part of the book comprises seven chapters characterised by a logical sequence of contents, evident interdependence and an integral inner structure. Chapter 1 focuses on the concept of sustainable agriculture. Starting from the lack of a definite definition of sustainable agriculture, the authors present outstanding knowledge of the literature on the subject and discuss three approaches to sustainability, starting from goal-oriented through strategy-oriented, they come to holistic definitions of sustainability. While the authors do not say so directly, the goal-oriented definition of sustainability by the Food and Agriculture Organisation of the United Nations (FAO) indicating that sustainable agriculture requires a system of global governance that promotes food security in trade regimes and trade policies, and revisits agricultural policies to promote local and regional agricultural markets, clearly relates to the concept of food sovereignty. This concept was presented at the World Food Summit in 1996 and it is understood as the right of individual countries or groups of countries to run an agricultural and food policy that is adapted to the need of the local population, while at the same time not having a negative impact on the populations of other countries. In this context, it may be stated that this concept, as well as the integrated efficiency approach introduced by the authors, is also based on the Pareto optimal allocation of resources. What is more, by assigning a high priority to the local production and consumption of food, the idea of food sovereignty does not exclude international trade in agricultural products, but instead promotes such a trade policy, which – as postulated by Amartya Sen – contributes to the reduction of the problem of malnutrition while at the same time promoting the goals of sustainable development. A definite feedback mechanism can be observed between the concepts of sustainable development of agriculture and food sovereignty. Thus we can propose a thesis that there is a mechanism of interdependence and simultaneity between them, as the realisation of one of these

concepts is impossible without the execution of the other: i.e. attaining the goals of sustainable agriculture promotes enhanced food sovereignty and vice versa. In relation to the strategy-oriented definitions, the authors rightly observe that despite complete agreement that sustainable agricultural systems are resource conserving, differences appear when deciding whether yields are to be maintained or increased, while reducing anthropo-pressure. The latter approach leads to holistic definitions of sustainability, evolving to address hunger and malnutrition in the world, which is particularly essential in view of the existing food gap of 6,500 trillion kilocalories per year on the one hand, and the fact that over a third of food produced is globally lost or wasted each year throughout the supply chain.

In conducting a critical review and evaluation of the definitions, the authors relate to the question investigated by many agricultural economists of whether it is possible to be competitive and environmentally friendly at the same time. In joining this discussion, it may be postulated that it is feasible if we combine the Joseph Schumpeter approach to innovation with Michael Porter's concept of innovation-driven competitiveness, the Pareto-optimal allocation of resources and the principle of social responsibility in the development of agriculture. It may be stated that this is the foundation for the authors' proposed integrated-efficiency approach. The excellent foundation for the research problem discussed in the economic theory is a true merit of this book. In joining the discussion on development directions for agriculture and the evolution from the model of industrial agriculture to sustainable farming, the authors address a major dilemma of present-day agrarian policy and contribute to the development of new agrarian economics, or more specifically sustainable development economics, which – as indicated until recently – was not equipped with a set of clearly defined concepts and research methods. In my opinion, the integrated-efficiency approach proposed by the authors can be considered a successful attempt at operationalisation of the concept of sustainable agriculture, as well as the development of methodological tools to measure the efficiency of an agri-environmental policy to attain or improve sustainability. A particular merit of this book is the explanation of how a multifunctional development of agriculture and rural areas and the financing of public goods can solve Willard Cochrane's treadmill issue. In the context of this problem, which was comprehensibly analysed by Bazyli Czyżewski in his book *Kierat rynkowy w europejskim rolnictwie* (Market Treadmill in European Agriculture), the authors formulate several new questions and research directions. Examples include: to what extent can the extensification of agricultural production resulting from subsidising public goods in rural areas be acceptable in the context of global food shortages? Or when coming to the methodological aspects, how to estimate the demand for public goods in rural areas, for which data are generally lacking? The authors' inquisitiveness and their

consistent research efforts indicate that they will likely focus on these issues in their future investigations.

In chapter 2 the authors present their concept of eco-efficiency integrating all three aspects of sustainability (economic, social, and environmental). What is important when referring to the latest publications in world literature on the subject, the authors have conducted a critical presentation of different approaches to valuing public goods and justification for the selection of the concept of the eco-efficiency approach to measure sustainability. This chapter contributes greatly to the theory and practice of sustainability measurement. In contrast to many previous studies, the authors do not measure each separate dimension of sustainability, but suggest a holistic sustainability measure. Using the concept of eco-efficiency through green efficiency (also known as agricultural green total-factor productivity) as the starting point, they shift to integrated efficiency confronting both the environmental and economic perspectives, while at the same time including the socio-economic one. Although they consider eco-efficiency as the most promising concept to measure sustainability, they are far from being naive or indiscriminate and instead point out the dilemma indicating that eco-efficiency may be more of an economic or biophysical concept and, if so, whether outputs and inputs should be measured in economic or biophysical units. Moreover, the authors present an interesting discussion regarding whether being eco-efficient does actually imply being sustainable; using the evidence from both developed and developing countries they seek to determine whether greater ambition regarding environmental protection must conflict with the economic objectives of the farm. The authors contribute to the methodological discussion on eco-efficiency measurement by the development of the slack-based measure approach, including undesirable and desirable outputs that reflect three dimensions of sustainability. Their model assumes that it is possible to reduce negative environmental outcomes without depleting the value of agricultural production, or in other words it is possible to expand production without increasing the pressure on the environment. The novelty of the integrated-efficiency approach is the occurrence of so-called "slacks". This means, on the one hand, that there is reduction potential in a particular input and/or undesirable output and/or expansion potential of desirable output without general changes in farm technology and affecting the other inputs/outputs (i.e. Pareto-like improvement). Moreover, desirable outputs may be increased and bad outputs and inputs may be reduced simultaneously and not necessarily proportionally. Such an assumption constitutes the superiority of this method over the standard radial DEA models, as it is much closer to agricultural practice and makes the measurement more reliable.

An interesting part of chapter 2 is also a synthetic review of major approaches to computing eco-efficiency and drivers of eco-efficiency demonstrated in previous

studies. It results from the review of research that by changing some farming practices or the input mix it is possible to improve eco-efficiency or decrease the environmental burden. However, practically no specific examples of what exactly should be done were found there. In the course of their research, Czyżewski and Kryszak decided to undertake this ambitious task, which is highly commendable. The quantification of the current state of sustainability in different parts of the world using the integrated efficiency approach, given in chapter 3, is preceded by a presentation of indicators used by other authors to measure the economic and social dimensions of sustainability. Based on the critical evaluation of earlier applications, the authors justify the adoption of food security and the income gap in their analyses as meta-factors that determine the social and economic dimensions of sustainability.

It needs to be stressed that chapters 1 and 2 constitute an excellent theoretical foundation for this study; they present the genesis and evolution of the model of sustainable agriculture, and confirm the need to follow this development path in view of the current environmental challenges, while at the same time, clearly explaining the research analytical process, concluded with the construction of the integrated efficiency measure of sustainability. This reasoning is also comprehensively presented in a synthetic overview of the investigations, thus promoting an understanding of the logic behind the research. The entire body of these investigations is based on an impressive literature review, confirming reliability and professionalism in the preparation of a research concept.

Chapter 3 consists of two parts. The first presents calculations of the level and change in basic indicators related to different aspects of farm sustainability across the three groups of countries based on FAO data. In the second, the authors study sustainability in an integrated efficiency framework, showing a country's efficiency in achieving various goals. The entire chapter is characterised by the logic of the line of reasoning as well as a clear and transparent presentation applying cause-and-effect analysis, which may be interesting not only for agricultural economists, but also for a broader group of readers interested in the problem, including students and PhD candidates, for whom this monograph may be a compendium of knowledge on the sustainable model of agriculture and methods to measure it. However, while obviously appreciating the methodological skills of the authors and the substantive value of this part of the book, I would like to formulate several polemical remarks and digressions. It needs to be remembered that the above remarks in no way reduce the value of these investigations, but rather confirm that they can provoke readers to pose further questions and stimulate scientific discussion.

Firstly, a comment is needed for the selection of indicators used in describing the three dimensions of agricultural sustainability. It is a fitting, well-justified

choice based on relative measures and actual rather than nominal values, which makes comparisons between countries and over different periods more objective. What is more, following the authors' integrated-efficiency approach, not only were the three dimensions of sustainability quantified, but it was related to the process of transforming inputs into outputs through a quantitative analysis of institutional variables affecting that process. It may only be speculated whether the results of these analyses might be different if instead of pesticide use per ha of total agricultural land its use per ha of arable land had been used.

Secondly, when it comes to social resilience, the authors state that: "One of the basic challenges in the contemporary food sector is related to the food security problem. Obviously, it is especially important in developing countries but also in developed countries, the food quality is of a great importance" (p. 50). In relation to the latter group of countries, not only may food security prove to be a problem. The authors have conducted their analysis at the level of groups of countries and in such a case the problem of a lack of food security measured by the average dietary energy supply adequacy is not evident. It is not observable at the level of region and sub-regions defined by FAO (it is interesting that in such an approach indicators illustrating the situation in North Africa achieved higher values than the respective indicators for some developed regions); instead, they are manifested only at the level of countries. The authors discuss this aspect in more detail using the hunger index. The problem of a lack of food security and the potential provision of a balanced diet in developed countries gains importance at the level of households, which is evident based on single-person households in the EU and the USA, particularly households of single elderly people, households of single parents or households of Hispanic/Latino Americans (in the USA).

Thirdly, in reference to institutional factors that influence the process of transforming inputs into outputs, definitely in the EU countries, China and the USA, foreign direct investments are relatively less important than in developing countries. This results first of all from the differences in capital resources and the level of investment realised to date. In developing countries we can still observe a considerable deficit of available capital, limiting their economic development in terms of supply and – in line with the Big Push model theory – stimulating the need for its inflow in order to overcome barriers to economic development (a separate problem is connected with the weakness of the domestic market limiting economic development in terms of demand).

Fourthly, when searching for aspects that can and should be improved in order to increase the integrated-efficiency level, the authors compare the values calculated for production in constant USD with those using constant international USD, which allows us to see the extent to which integrated efficiency is impacted

by the market failure. Then the changes in slacks as well as changes in integrated efficiency are investigated, while the global profits resulting from the elimination of slacks are identified. All these research steps constitute a novelty and contribute to the great scientific value of the study. In the course of their analytical discussion the authors show that, as regards integrated efficiency, more intensive agriculture may be beneficial, since the relation between inputs and outputs is more rational. They also prove that market imperfections have a very serious impact on the level of integrated efficiency and slacks calculated, while slack levels could be diminished if the world agricultural market worked optimally and agricultural prices would converge on one equilibrium level. The main message from the analyses is that a modern and relatively intensive agriculture still pays off, while a significant saving on inputs and bad outputs could have been achieved in that period if inefficiencies had been eliminated. A promising insight is also that on a global scale, the adequacy of basic input use is improving, while many countries still have considerable potential for improvement in a more rational use of inputs. At the same time, slacks analysis gives us hope that a significant reduction in emissions is possible in future.

Next, when showing the extent to which improving integrated-efficiency levels would contribute to reducing emissions and saving resources in the global perspective, the authors state that "less people could be engaged in agricultural activity (between 7.8 and 8.3%) and they could move to work in other sectors" (p. 94). This is true; however, it is not easy to achieve in practice due to the issue of structural unemployment. The population released from agriculture has specific qualifications, not necessarily adequate or meeting the expectations of employers in other sectors of the economy. Moreover, a problematic issue is connected with the need to absorb these people (the number of potential new jobs) in non-agricultural sectors.

Finally, in referring to the technical aspects of this study, when identifying groups of countries that share a similar model of agriculture, the authors carry out a multivariate test of means to assess the effectiveness of the clustering procedure, that is to check whether our clusters really differ from one another. It needs to be stressed that such analytical control and concern for the credibility of the results is rare and highly commendable. In relation to the aspect of terminology, slight objections may be voiced in relation to the authors' use of the term "the natural resources sector" in relation to agriculture, forestry and fisheries. In most classifications of economic activity, such an aggregate, apart from agriculture, also comprises the mining and energy sectors, which are excluded from this analysis. Moreover, the term "average dietary energy supply adequacy" would need to be explained, as it is a term very well known to food security analysts, but not necessarily obvious

to readers less knowledgeable in this area, but nevertheless interested in agricultural sustainability.

Chapter 4 discusses the problem of the effectiveness of agri-environmental policy and develops the thesis that the implementation of environmental goals will always be ineffective when it contradicts the Pareto-optimal allocation of resources. First, the authors review different methods to assess the effectiveness and strategies related to greenhouse-gas emissions, carbon sequestration, bioenergy, biodiversity and landscape public goods. Then, having in mind limited and short-term environmental and climate impacts of green Common Agricultural Policy (CAP) components, making a small contribution towards promoting more sustainable farming practices, and pointing at synergies and trade-offs of policy measures, they explore why analyses of policy effectiveness often fail to produce clear-cut results. They argue that it makes sense for holistic evaluations to use synthetic measures of sustainability including economic and social aspects rather than single ecological indicators. This point of view is the motivation for the authors to develop the integrated-efficiency score and the slack-based analysis that addresses the needs of such study. What is essential, is that the authors are aware and specifically warn readers that "the proposed approach does not replace the single-scheme effectiveness assessment, but complements it, drawing attention to the fact that if the toolbox of agricultural and environmental policies induces allocative inefficiencies, it will always be ineffective to some extent" (p. 149). In evaluating the contents of this chapter we again need to appreciate the Authors' work, not only for their critical presentation of the body of world literature on the subject and their attempt to systematise current accomplishments in this field, but primarily for their conscientious verification and discussion supported by rational arguments. In relation to the dilemmas of designing an effective agri-environmental policy discussed by the authors, I would like to present a certain polemic as to whether the Carbon Border Adjustment Mechanism that is a part of the new EU industrial strategy should not be seen as protectionism. In my opinion, this mechanism introducing a carbon tax on products from countries with less ambitious regulations in order to reduce their carbon footprint to the EU level, and making the imported product no cheaper than a similar EU product is a typical example of neo-protectionism, which employs non-tariff trade barriers "to hide" the intention to protect domestic producers or branches of the national economy. As it can take the form of the hidden implementation of price-control measures (including additional taxes and charges), discriminating against the competition and at the same time outside the control of the World Trade Organisation (WTO), this present-day protectionism is much more subtle than its traditional, 19th-century version, and as such it is difficult to detect and challenge. It can

and in fact, it usually is applied selectively towards sensitive branches of production or selected trade partners. The Carbon Border Adjustment Mechanism meets all the above-mentioned features of contemporary protectionism.

In chapter 5 the authors recommend a novel, holistic cost-effectiveness assessment of the impact of environmental and agri-environmental expenditures on the efficiency of a multi-scale system of agricultural output/input data (including public and undesirable goods). Then, using the FAO data they present the results of a holistic cost-effectiveness analysis of environmental policy on a global scale and across three country clusters aggregated in chapter 3. In order to make it easier for readers to follow their reasoning, the authors' strategy of assessing the holistic cost-effectiveness of an agri-environmental policy is synthetically and comprehensively presented in a diagram (p. 155). Among others, the authors come to a definite conclusion that, paradoxically, in less developed countries with relatively low resource productivity in agriculture it may be easier to implement cost-effective environmental and agri-environmental policies. The authors focus on the EU countries. Based on the literature review and slacks analysis in EU agriculture, synergies and trade-offs of sustainable agriculture strategies are identified and summarised with the help of Figure (p. 170). In the final step, a few disjoint scenarios of CAP development beneficial to sustainable agriculture were suggested. This is a real value added and should be an inspiration for policy-makers when designing the agri-environmental policy for the next programming period.

Chapter 6 presents a general description of agricultural policies in the EU, the USA and China as well as their evolution towards agri-environmental policies. Based on a critical assessment of different philosophies of agricultural support, the authors have made a successful attempt to establish some general guidelines that could be implemented elsewhere. Focusing on differences and similarities of policy support for agriculture, the authors effectively apply the Organisation for Economic Cooperation and Development (OECD) support indexes to show the pattern of support and its changes between 2005 and 2020. However, this fragment may be slightly more difficult to follow for readers less knowledgeable in the problem of support for agriculture, since the indicators used are not described in more detail. In my opinion this is the only slight drawback of this chapter; however, it is more than aptly compensated for by the extremely interesting discussions concerning the major problems of implementing agricultural policy, such as capitalisation of subsidies, distributional inequalities, and ageing. As in the previous sections of the book, this is not just a simple description of the difficulties, but a balanced, rationally justified point of view of the authors on this subject, based on the results of previous research.

Chapter 7 includes a detailed discussion of the results of the holistic cost-effectiveness analysis of environmental policy in chapter 5, while it also presents conclusions on how to build an effective sustainable agriculture policy. The authors state that a justification of an active agri-environmental policy should be based on three fundamental premises: i.e. the increased level of risk, the provision of public goods and the need to ensure food security. Then, using the evidence from the EU, the USA and China, they discuss doubts and the main challenges concerning these premises in order to seek the best solutions and an optimal system of support for environmental practices. Finally, they propose a systemic, problem-based approach in order to build an effective system of policy schemes for sustainable agriculture. In conclusion, the authors postulate a twin-track system for a sustainable agriculture policy in the combination of a counter-cyclical and pro-efficiency path with decoupling and public-goods valuing. To sum up, attempts to combine support for productivity with payments for public goods seem necessary for the goals of sustainable agriculture.

The general lesson from the research by Czyżewski and Kryszak is that the objectives of an efficient agri-environmental policy should be multi-faceted and designed with full awareness of both the peculiarities of agriculture and trade-offs and synergies between different aspects of this policy. The authors' measure of integrated efficiency is an example of such an objective. In conclusion, I would state that this monograph is an ambitious, original, novel and – in my opinion – commendable work, of great scientific, methodological and practical merit. This study not only fills the existing gap in the theory and methodology of research on sustainable development of agriculture but also presents several recommendations for agri-environmental policy. Additionally, it creates new opportunities for scientific discussion and the search for novel directions in research on this subject. The topic, the method adopted to solve the research problem, a multi-faceted and critical explanation and interpretation of the research results as well as its recommendations make the book valuable for a wide group of readers, including researchers, PhD students, policy-makers and other stakeholders interested in designing an efficient agri-environmental policy.