THE USE OF THE ENVIRONMENTAL KUZNETS CURVE IN THE MANAGEMENT OF SUSTAINABLE DEVELOPMENT

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The relationship of economic growth and environmental impact has spurred fierce debates between growth optimists referring to the phenomenon of the environmental Kuznets curve, *and pessimists referring to the limits to growth. The article draws some hints from a critical assessment of the literature on the* environmental Kuznets curve. *In particular, it is argued that the optimistic implications of this literature on the sustainability management are ungranted. However, analysis of* environmental Kuznets curves *allows a clarification of the few basic conditions for the management of sustainable development, including the sustainability of globalisation. These conditions can be met by implementing a systematic policy strategy aimed at shifting the Kuznets relations downward.*

INTRODUCTION

General theoretical urgency. "Sustainable growth" has recently become an issue of international debate at the EU. However, these debates are not based on the criteria that have to be fulfilled for the growth to be sustainable. But it is more uniquely accepted that the dominating development models contain serious deficiencies, and that the current development trajectory is ***clearly unsustainable***. Discussions of the recent years on the dissociation of the previously positive relationship between economic growth and resource utilisation (environmental degradation) are clearly related to the research of ***environmental Kuznets curves***, where resource degradation will increase initially with per capita income growth and then eventually decline, thus exhibiting the characteristic inverted U-shaped relationship between affluence and emissions known as the "*environmental Kuznets curve*", where emissions initially worsen but ultimately improve with income.

Problem. In order to incorporate environmental issues into the macro-economic analysis, *a totally new approach to the economic theory is needed, which could allow to review the standard technique of calculating national income, as ecological factors have not acquired an acceptable expression in the indicator system of modern economic development.*

Research objects. The attention is focused on the analysis of the indicators of sustainable development. The environmental indicators that must be used in the decision making about sustainability are presented.

Objectives. *The content of environmental indicators, including concepts of ecological*

space and ecological footprint, and the problems from the perspective of their suitability for decisions on economic development sustainability are critically investigated.

Tasks. In order to fulfil these objectives, the following tasks had to be accomplished:

- to analyse the need of the indicators in the management of the sustainable development;
- to analyse the potential of macro-economic indicators for evaluating welfare and sustainability;
- to review environmental indicators used in economic development sustainability decisions;
- to discuss the ecological footprint and the environmental space concepts from the viewpoint of their sustainability evaluation potential;
- to formulate theoretical principles for calculating the environmental space for certain resources.

Methods of research. In the article were used the methods of *logic abstraction*, which encompasses generalisations on economic and management theories and thoughts, theoretical systems analysis of the problems of sustainable development according to the conclusions and reasoning of scientists from other countries, a comparison and research of the processes of the development of economic systems (industries). The main scientific works related to the problem in question have been reviewed and thoroughly analysed.

THE ESSENCE OF THE ENVIRONMENTAL KUZNETS CURVE CONCEPT

During the most part of the course of industrial development, economic growth entailed a parallel growth in resource consumption and environmental degradation. Though this relationship still holds, experience of the last decades indicates that economic growth and increase in resources consumption and environmental degradation *can* be de-linked to a considerable extent. The path to environmental sustainability lies in maximising this de-linking prosess. So, the theoretical explanation of the *environmental Kuznets curves* plays a central role in the theoretical foundation of sustainable growth.

Some relative data on environmental quality and the utilisation of natural resources and income per person allows us to make a presumption that environmental quality worsens with a low income level. But the situation improves with an increase of the income level, which reflects "the pressure of dissociating environment with economic growth" (Simonis, 1989). This relationship – as the income of an economy grows over time, emission level grows first, reaches a peak and then starts declining after a threshold level of income has been crossed – was first suggested in the early 1990s and has thereafter been subject to intensive research. The inverse relationship between pollution and per capita income has been explored for a variety of pollutants, such as nitrogen oxide, sulfur dioxide, suspended particulate matter, carbon monoxide, lead, and for deforestation, biological oxygen demand and others (List, Gallet, 1999; Selden, Song, 1994; Stern, et al. 1996; World Bank, 1992; Panayotou, 1997, Grossman, Krueger, 1995). The empirical literature about *environmental Kuznets curves*, which studies the empirical relationship between per capita income, generally interpreted as a proxy of the stage of development measured on the horizontal axis, and environmental deterioration measured on the vertical axis by different indexes: total environmental deterioration, or more often its

per capita value or its value per unit of income; extensive critical survey is given in (Stern, et al., 1996; Borghesi, 2001).

This interrelation between the national income per person and the concentration level of industrial waste by P. Dasgupta and K.-G. Maler (1995) is called the ***environmental Kuznets curve***, analogous to a traditional curve proposed by Simon Kuznets (1955), which demonstrates a similar relationship between actual income per person and income inequality (Figure 1). (As is well known, S. Kuznets observed that inequality tends to increase during the early stages of growth to decrease later on, describing an inverted-U shaped relationship between per capita income (on the horizontal axis) and income inequality (on the vertical axis). This relationship, called the Kuznets curve after the name of the author, was very popular during the 1970s when it was taken as an empirical regularity of the economy).

Most commonly, the studies of *environmental Kuznets curves* have taken econometric approaches using data based on cross-sections of countries and sometimes combining this with time series data. Historical approaches to the *environmental Kuznets curve* or other emission patterns, such as studies of individual country's historical emission trajectories, have been relatively rare. *Environmental Kuznets curve* studies for single countries most often address developing countries (e. g., Patel et al., 1995; Vincent, 1997). Rare exceptions addressing industrialized countries include (De Bruyn et al., 1998; Friedl, Getzner, 2003). But, as shown by M. Lindmark (2002), historical studies of individual countries offer an advantage over cross-section approaches in bringing the analyses closer to the dynamics that modity the *environmental Kuznets curve* pattern. An investigation of the time-series data of a single country may be able to account for historic experience such as environmental policy, development of trade relations, and exogenous shocks such as the oil crisis (Stern et al., 1996). It has also been suggested that the *environ-*

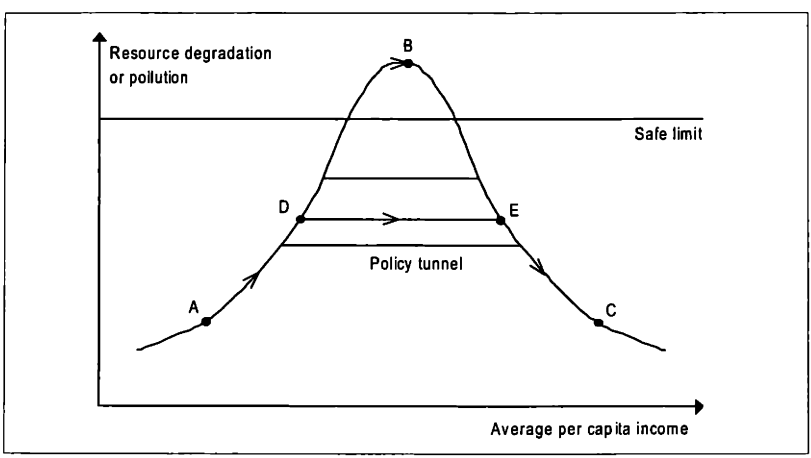

Figure 1. ***Dependence of environmental quality on income level***

mental Kuznets curves based on time series data show much less stable development paths as compared with *environmental Kuznets curves* derived from cross-section data.

A number of survey articles (Ekins, 1997; Stern, 1998) prompted several clarifications concerning both the actual development of various pollutants and the methodology used to explain the *environmental Kuznets curve* patterns. The literature has mostly considered the *environmental Kuznets curve* as an empirical phenomenon and examined the presence or otherwise a significant statistical association between the level of economic activity and environmental degradation without explicitly discussing the nature of causation between these variables. The principal explanatory factor is *income* based on assumptions of the initially high but falling marginal utility of consumption and the initially low but increasing disutility of emissions as the incomes rise. Thus, it is presumed that the relationship between the income and pollution is a relationship of unidirectional causality with income causing environmental changes – viz. a change in the level of economic activity/per capita income causes a consequent change in the environmental quality and not vice versa. Additionally, *technological* and *structural changes*, including *trade patterns*, may also influence an the *environmental Kuznets curve* pattern. These changes may in turn interact with *price changes*.

As given in the paper of S. Borghesi and A. Vercelli (2003), in the case of air-quality indicators the existence of the *environmental Kuznets curve* found good support for local air-pollutants (e. g., Grossman, 1995) but not for global pollutants (such as CO_2), which have a limited direct impact on population (Cole et al., 1997). CO_2 emissions cause problems on a global scale, and the social costs of global warming accrue both across time and nations. Therefore, free-rider behaviour might lead to a close relationship between carbon emissions and income at all levels of per capita income (Arrow et al., 1995). In line with this argument, a linear relationship for CO_2 emissions and GDP per capita was confirmed in early studies (Shafik, 1994). But the international nature of global warming is not the only reason that prevents de-linking greenhouse gas emissions from economic growth. The intergenerational nature of the negative impact of greenhouse gas emissions may have also been an important factor preventing the implementation of greenhouse gas abatement measures in the past. For water quality the evidence is more mixed, with studies giving conflicting results on the shape, position and peak of the curve according to the different indicators used. As for the other indicators of environmental degradation, the *environmental Kuznets curve* hypothesis receives very little corroboration. Environmental problems that have a direct and strong impact on the population (such as access to urban sanitation and clean water) tend to improve steadily with the process of development, while environmental problems that can be transferred elsewhere (such as municipal solid wastes) do not exhibit any clear tendency to diminish with development (see Rothman, de Bruyn, 1998). Whatever degree of corroboration seems reasonable to attribute to the *environmental Kuznets curve* hypothesis on the basis of cross-country studies, single country studies reach very questionable results even in the cases best supported by cross-country studies (see, for instance, Vincent, 1997).

So, it should be noted that *environmental Kuznets curves* do not explicate on the systems' consequences of environment utilisation, therefore they should not be further used as a proof or a critical argument in grounding the

statement that economic growth is sufficient to achieve environmental improvement. Thus, considering all arguments, the *environmental Kuznets curve* should be viewed as *the hypothesis on the interrelation between economic growth and environmental quality*.

It must be mentioned that recent studies have also tested for a possible third order polynomial relationship between emissions and income (Moomaw, Unruh, 1997). However, they conclude that neither the inverted "U" nor an A cubic (i. e. "N"-shaped) relationship between CO_2 emissions and income provide a reliable indication of future behaviour. Hence the use of *environmental Kuznets curve* models to forecast future emissions may not be appropriate. On the other hand, Jones and Manuelli (1995) using an overlapping generations model show how the interaction of individual optimal decision making and collective regulation may lead to an *environmental Kuznets curve*, but also a N-shaped curvature is possible. An N-shaped relationship between Austria GDP and CO_2 emissions is found to fit the data most appropriately for the period 1960–1999 in the research done by Friedl B., Getzner M., 2003 too.

INDIVIDUAL PREFERENCES AND ENVIRONMENTAL KUZNETS CURVE

M. Pasche (2002) showed that the sources of the *environmental Kuznets curve* can be summarized into two groups: (a) *the structural change to service and information-based economic activities* which are less pollution-intensive than physical production and (b) *the growing ecological efficiency of production and consumption by means of a "greening" technical progress.* The driving forces behind these two determinants may be a change of preferences favoring environmental goods or at least a sufficiently high income elasticity of demand for environmental goods on the one hand, and regulating activities like, e. g. technical standards, legal restraints, environmental taxation on the other hand.

However, within the extensive body of literature that has been published in the recent years concerning the *environmental Kuznets curve*, two main theoretical arguments have been formulated to account for the fact that beyond a particular level of per capita income the relationship between economic growth and environmental quality becomes a "virtuous" circle (Roca, 2003). Both arguments concern the changes in levels of relative demand that occur as per capita income varies.

The first argument suggests an endogenous change in the demand structure for goods and services. According to this first argument, the sectors that become increasingly important as per capita income increases are those whose environmental impact is less. The evidence that generally underlies this position is the increasing demand directed at the service sectors at the expense of demand directed at the industrial sector. However, much more empirical research needs to be done on the assumptions this argument is based on: some activities that are regarded as services may have as much or more environmental impact (direct and/or indirect) as others involving the industrial sector (consider, for example, long-distance tourism). In any case, this argument would only explain a reduction in environmental pressures per unit of GDP as income increases; it would not explain a reduction of these pressures in absolute terms unless we suppose that the sectors that are most environmentally problematic produce inferior goods. In fact, this is not at all likely (Torras and Boyce, 1998). In other words, if we apply the distinction made by de Bruyn and Opschoor (1997), the change in

demand structure could account for a "delinking" of economic growth and (some) environmental pressures in the "weak (or relative) sense" but not in the "strong (or absolute) sense".

The second argument, as mentioned by J. Roca (2003), is also based on individual preferences and changes in relative demand that occur as income increases. In this case, however, it is not the changes in relative demand for different goods and services acquired in the market that are crucial, but those between the consumption of marketable goods and services on the one hand and environmental quality on the other. According to Lopez (1994), the relation between the level of pollution and the income level then depends on the elasticities of substitution of goods and the risk preference of the households. And a high "income elasticity of demand for environmental quality" could potentially explain the delinking of economic growth and environmental pressures in the "strong sense".

In other words, under the *environmental Kuznets curve* hypothesis, with growth of income the status of emission as an item of consumption gradually changes from a *necessary* to an *inferior good* (thus reflecting a clear preference for a cleaner environment at higher levels of living).

An interesting idea is given in the K. A. Brekke, R. B. Howarth and K. Nyborg (2003) paper about the status-seeking and material affluence, evaluating the *Hirsch hypothesis*. When individuals hold a preference for high relative consumption, competition to achieve social status can lead to inefficiently high levels of production and consumption, contributing to natural resource depletion and environmental degradation. In the 1970s, F. Hirsch (1976) argued that an increasing portion of expenditure is allocated to status-seeking as average income rises. If Hirsch's hypothesis were correct, then status-seeking would contribute substantially to the problem of overconsumption in the world's richest nations (see Sachs et al., 1998), and consumption levels could be reduced significantly without accompanying reductions in the quality of life. However, as shown by the authors of the paper, Hirsch's hypothesis depends critically on the empirical assumptions that may or may not be satisfied in the real world. When the social status is defined in terms of the algebraic difference between an individual's consumption of the status goods and the average consumption level in society, Hirsch's hypothesis holds true, and growth in the level of productivity and output can lead to declines in human welfare. If, on the other hand, the status is linked to the ratio of individual and average consumption, Hirsch's hypothesis is valid only if social status and non-status goods are poor substitutes.

GLOBALISATION AND ENVIRONMENTAL KUZNETS CURVES

In the original definition of sustainable development, suggested by the Brundtland Commission (WCED, 1987); "*sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*", inequality and environmental deterioration are conceived as equally important and interdependent conditions of sustainability. The recent process of globalisation of international markets has managed to sustain the economic growth of the countries that have actively participated in this process. The available empirical evidence suggests, however, that it has been accompanied by a worldwide increase in environmental degradation and economic inequality. Therefore, there is growing concern that these features of

the globalisation process may jeopardise its social and environmental sustainability. On the other side, we must take into account that no operational set of simple criteria has been developed so far to assess the sustainability of a given growth pattern. This is all the more true for measures combining environmental and social criteria.

However, one thing is obvious: the causal relationship between globalisation and global environmental degradation is quite complex and ambiguous. As pointed out in the paper of S. Borghesi and A. Vercelli (2003), environmentally sustainable globalisation requires a policy strategy directed to shifting the relationship between *environmental Kuznets curve* relations downwards. Within the process of globalisation it is possible to modify the shape and position of the *environmental Kuznets curves*, thus improving social and ecological conditions. In the case of the environment, public opinion can influence environmental quality not only through the voting system, but also through the market: "greener" consumer demand contributes to a shift in production and technologies towards less polluting activities. Globalisation may increase competition and thus strengthen public opinion pressure for environmental quality. In a more competitive market consumers are likely to have more alternatives to polluting products and thus more chances to express their environmental demand. This positive impact of globalisation on the environment, however, crucially depends on the actual capacity of globalisation to increase competition. If a greater market concentration comes together with globalisation (as occurs in some sectors), then the opposite might be true and environmental-friendly consumers might end up with fewer opportunities to express their preferences. S. Borghesi and A. Vercelli (2003) conclude, therefore, that globalisation might contribute to a more sustainable development by enhancing the impact of public opinion pressure on government and market decisions and thus shifting the *environmental Kuznets curve* relations downwards.

We must take into account one argument that may play a role for the explanation of the *environmental Kuznets curve* in industrialized countries: the relocation of pollution-intensive industries from developed to less developed countries and the re-import of the products. This may be an empirically valid argument (see (Suri, Chapman, 1998)), but this practice is obviously not a basis for global sustainability. As show by (Muradian et al, 2002), who estimated embodied pollution in trade of 18 industrialized countries with (a) the rest of the world and (b) developing countries from 1976 to 1994, the balance of embodied emissions in trade seems to follow an inverted-U shape across time in Japan and Western Europe, and an N-shape in the US. In the period of analysis, the Japanese and European environmental terms of trade with developing countries "improved" (from the Japanese and European point of view), whereas the American environmental terms of trade with developing countries "deteriorated" over time. Although there is no statistical trend between income and embodied emissions in imports in a cross-section analysis, there does seem to be a positive relationship between both variables at a national level. The results suggest that, despite many shortcomings, this type of assessment may provide useful insights on the international aspects of sustainable development.

The empirical magnitude of future technological change may well swamp the effect of depletion of natural resources and environmental pollution (Weitzman, 1997). In these circumstances, future generations will enjoy higher rates of well-being than today, even if the physical availability of different types of

capital declines. Technological progress reduces the long-run costs of policies to meet sustainability goals, as higher initial costs elicit cost-reducing innovations at later stages. Second, it increases the benefits from early actions, as higher initial costs may translate into technology leadership at a later stage (Grubb et al., 2001). Technology may also help to de-link economic growth from environmental degradation and to respond to the needs of the world's poorest. This impact is not automatic, though.

However, M. Pasche (2002) showed that under reasonable assumptions about technical progress a positive sustainable growth rate fails to exist. The argument is that a growing part of income has to be spent for continuing technical progress in order to compensate the pollution effects of growth. Hence, in the long run either the sustainability condition will be violated or the growth rate must decline to zero. Furthermore, in finite time the level of wealth will decrease despite growing income and a constant pollution level, thus further growth is no longer reasonable. Similar arguments also hold for the environmental effects of structural change favoring less pollution-intensive economic activities, when the part of pollution-intensive production can decrease while less pollution-intensive services or information-based production increases. Hence, the level of output can rise with constant or reduced emissions. An evolutionary change of goods and production technology may shift the limits of growth and is hence a prerequisite for a long-run *environmental Kuznets curve*. But the possibilities of a rational sustainability policy seem to be limited.

So, per capita income, in turn, affects inequality and environmental degradation through several channels, as suggested by the literature on the *environmental Kuznets curve*. Although the findings regarding the "*environmental Kuznets curve*" are not conclusive (the mentioned survey gives only limited support to the *environmental Kuznets curve* hypothesis), most empirical studies have generated very high income turning points beyond the maximum income level of the data they used in their analysis, and beyond the level of affluence to which most developing countries might realistically achieve in the foreseeable future. For example, Holtz-Eakin and Selden (1995) generate an out-of-sample turning point of $ 35000 per capita (1986 US$) that indicates that substantial economic growth would be required before CO_2 emissions begin to decline. de Bruyn (1997) provides a survey of the empirical studies.

Several empirical studies of the 1980s and 1990s give an optimistic view: in industrialized countries many pollution indicators decreased despite a growing per capita income, while in less developed countries growth yields increasing pollution. Therefore, economic progress with less impact on the environment seems to be possible. The idea that economic growth is ultimately beneficial for the environment has caused some authors to maintain that only economic growth is necessary, because the surest way to improve the environment is to become rich (Beckerman, 1992). This viewpoint implies that environmental problems are a temporary phenomenon, since economic growth and technological innovation will resolve these problems in due time.

But the fact that the nations that formerly had or currently have a low per capita income are experiencing increasing pollution while industrialized countries are successful in abating emissions does not imply that economic development will solve environmental problems quasi automatically. It is possible to make only one statement: the research results have proved the presumption that economic growth can be conformed to environmental improvement, if accordingly a specific policy is worked out. The key policy conclusion is that even if such a curve characterized past growth, there is no reason for developing countries passively to accept "historical determinism" along their future development path. In effect, lower-income countries could learn from the experience of wealthier nations and adopt policies that permitted them to "tunnel" DE

(Figure 1) through the curve (Munasinghe, 1999). However, in no case can it be expected that public environmental problems will automatically be solved as a result of economic growth, without the need for environmental policy (Arrow et al., 1995). If we deny the need for environmental policy, we are renouncing the mechanism through which higher income could lead in some cases to a reduced environmental impact. And some recent studies show that economic and social policy may have a very important role in determining the emergence of the downward sloping part of the *environmental Kuznets curves* (Panayotou, 1995; Grossman, 1995; Torras, Boyce, 1998).

So, as mentioned by Spangenberg et al, 2002, while it is unrealistic to expect that economic growth *per se* (if only high enough) would improve distributional justice and reduce environmental pressures, it has been demonstrated that a delinking of growth and environmental pressures (emission levels and – increasingly – resource input) is possible in both the short and the medium term. This, however, does not happen automatically but needs deliberate policies. Green taxes, energy saving measures, employment subsidies and the like have all been repeatedly suggested (for an overview on international eco-tax studies, see Bosquet, 2000).

CONCLUSIONS

1. Discussions on dissociation of growth and environmental degradation are based on *environmental Kuznets curves*. Applying critical scientific argumentation, it can be stated that *environmental Kuznets curves* must be viewed as a hypothesis on the interface between economic growth and environmental quality.

2. A principal explanatory factor of *environmental Kuznets curve* is income. Additionally, technological and structural changes, including trade patterns, may also influence the *environmental Kuznets curves* pattern. These changes may in turn interact with price changes.

3. Some economists maintain the optimistic view that individual preferences of rich people eventually lead to a virtuous-circle relationship between rising income and environmental degradation. Several critical comments could be made concerning this point of view, but the most important point is related to the various manners in which environmental costs are displaced.

4. Hirsch's hypothesis that the share of income devoted to the purchase of status goods should rise in the face of economic growth holds true only under particular assumptions regarding the structure of individual preferences, even if the marginal utility of consumption is decreasing and the supply of status is fixed.

5. The process of globalisation may render the world's development more sustainable simply by pushing the world economy towards the decreasing part of the bell-shaped *environmental Kuznets curves*.

6. Environmental technical progress and structural change can lead to positive growth rates with a constant or even decreasing level of pollution. Hence, the results are compatible with the *environmental Kuznets curves*. However, this can only be a temporary phenomenon, since in the long term either the condition of a non-increasing emission level is violated (the *environmental Kuznets curves* become N-shaped), or the growth rate must converge to zero.

7. While it is unrealistic to expect that economic growth *per se* would improve the distributional justice and reduce environmental pressures, it has been demonstrated that a delinking of growth and environmental pressures (emission levels and – increasingly – resource input) is possible in both the short and the medium term. This, however, does not happen automatically (it cannot be assumed that the market is able to automatically solve the environmental problem) but needs deliberate policies.

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APLINKOS KUZNETS KREIVIŲ NAUDOJIMAS VALDYTI DARNIĄ PLĖTRĄ

Remigijus Čiegis

Santrauka

Ekonominio augimo ir poveikio aplinkai ryšys sukėlė karštus optimistiškų ekonominio augimo šalininkų, apeliuojančių į aplinkos *Kuznets kreivės* fenomeną, ir pesimistų, nurodančių ekonominio augimo ribas, debatus. Straipsnyje analizuojama kai kurie kritiniai momentai, akcentuojami literatūroje apie *aplinkos Kuznets kreives*. Teigiama, kad optimistinės išvados dėl galimybės panaudoti šias kreives darniai valdymo plėtrai yra nepagrįstos. Bet *aplinkos Kuznets kreivių* analizė leidžia išryškinti keletą bazinių darnios plėtros valdymo sąlygų, įskaitant globalizacijos darnumą. Šios sąlygos gali būti užtikrintos įgyvendinus sistemišką politinę strategiją, leidžiančią paslinkti Kuznets ryšį žemyn.

Pastaraisiais metais vykusių diskusijų apie ekonominio augimo ir aplinkos degradavimo atsiejimą ženkli dalis yra ypač susijusi su *aplinkos Kuznets kreivių* tyrimais. Pateikti kai kurie aplinkos kokybės (bei gamtos išteklių naudojimo) ir pajamų, tenkančių vienam gyventojui (tradiciškai išmatuotų), ryšio duomenys leidžia daryti prielaidą, kad aplinkos kokybė prastėja esant žemam pajamų lygiui, bet po to labai pagerėja pajamų lygiui padidėjus, tai rodo „spaudimo aplinkai atsiejimą nuo ekonominio augimo". P. Dasgupta ir K. G. Maler (1995) pavadino šį nacionalinių pajamų, tenkančių vienam žmogui, ir pramoninių teršalų koncentracijų lygio ryšį **aplinkos Kuznets kreive**, analogiškai įprastai Simon Kuznets pasiūlytai kreivei, rodančiai panašų realių pajamų, tenkančių vienam gyventojui, ir pajamų nelygybės ryšį.

Reikia pažymėti, kad *aplinkos Kuznets kreivės* iš tiesų nedaug tepasako apie aplinkos panaudojimo bendrasistemines pasekmes ir todėl neturėtų būti naudojamos kaip įrodymas ar lemiamas argumentas pagrįsti teiginį, kad ekonominis augimas yra pakankamas siekiant aplinkos pagerėjimo. Juk svarbiausios pamatinės

prielaidos siekiant pagrįsti ekonominio augimo teigiamus rezultatus buvo tai, kad: 1) pradiniais augimo etapais stebima žala aplinkai bus grįžtama; 2) žmonių padarytas kapitalas (įranga ir pastatai) bei patys žmonės gali sėkmingai pakeisti gamtinį kapitalą, sunaudotą ankstyvais plėtros etapais. Bet kaip savo darbuose parodė daugelis ekonomistų, neribotas pakeitimas tarp gamtinio ir žmonių padaryto kapitalo yra negalimas. Be to, *aplinkos Kuznets kreivės* numato taršos mažėjimą tik pasiekus pakankamai dideles vidutines pajamas, viršijančias BNP, tenkančio vienam gyventojui, dabartinį pasaulinį medianos dydį, o tai esant dabartiniam pajamų lygiui ir jų pasiskirstymui reikštų, kad aplinkos naudojimas ir toliau turėtų didėti daugelį dešimtmečių pereinant per aplinkos degradacijos maksimumo, tuo pačiu išliekant žymesniam netolydumui.

Tačiau net jeigu tokia kreivė iš tiesų buvo būdinga augimui praeityje, dabar išvystytos ekonomikos šalims savo plėtotės eigoje laipsniškai perėjus nuo žemės ūkiu grindžiamos ekonomikos į industrinį ūkį ir toliau į postindustrinę fazę, ekonomikoje vis labiau įsivyraujant paslaugoms, vis dėlto nėra jokio pagrindo besivystančioms šalims pasyviai priimti „istorinį determinizmą" kaip savo ateities plėtros kelią ir, remiantis tuo, kad aplinkos nuostoliai yra struktūriškai nulemtas bei neišvengiamas ekonominio augimo rezultatas, nesiimti jokių priemonių išvengti šios žalos pradiniais plėtros etapais. Iš tikrųjų žemesnių pajamų šalys gali pasimokyti iš turtingesnių tautų ankstesnės patirties ir panaudoti tokią politiką, kuri joms leistų „išsikasti tunelį" *aplinkos Kuznets kreivėje*. Besivystančios šalys tuo būdu gali išvengti aplinkos degradacijos piko, siejamo su įprasta plėtros trajektorija, kuri tik imituotų rinkos ūkių raidą. Taigi turėtų būti akcentuojama paieška politikų, kurios padėtų atsieti aplinkos degradavimą ir augimą, o tai sumažintų daromą žalą aplinkai judant plėtros trajektorija. Laikantis tokio požiūrio, *aplinkos Kuznets kreivės* tampa naudingomis metaforomis ar savitais rėmais socialinių-ekonominių bei aplinkosauginių politikų analizei, o kiti klausimai tampa nebe tokie svarbūs, pavyzdžiui, tiksli *aplinkos Kuznets kreivės* forma, bei ar empiriškai apskaičiuotos *aplinkos Kuznets kreivės*, dažniausiai paremtos tarpsektorinias ar pulų duomenimis (o ne stebėjimų laiko eilėmis), gali adekvačiai apimti vienos atskiros šalies augimo charakteristikas.

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