

GREEN GOVERNANCE PRINCIPLES IN THE DEVELOPMENT OF ENVIRONMENTAL EDUCATION INFRASTRUCTURE

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Abstract. Green governance principles entails perception of the most basic premises of economic, political, and legal orders, as well as cultural orders. It addresses local context and social diversity in structuring social and economic activity and environmental problems that requires understanding of values in social and economic thought to account for nature and social well-being. Environmental education infrastructure integrates basic analysis, critical thinking, and instructs people to evaluate different sides of an environmental issues in order to make necessary every day choices. The aim of the paper is to investigate interdisciplinary approach of the green governance principles in the local context and discover development of environmental education infrastructure in Latvia. The paper examines the green governance principles reflecting theoretical approach described by Weston B. H., Bollier, Biermann F., Adger N., Jordan A. and environmental education infrastructure theoretical approaches by various scholars Leopold A., Carson L.R., Naess A., Brudtland G.N., Palmer G.N.,J. and Stevenson R.B., Brody M. in order to analyse green governance principles development in the context of environmental education infrastructure integration. As such, the term "environmental education infrastructure" is seldom encountered in the sociological or economic theoretical discourse; therefore, the paper will provide common understanding of environmental education as broader view of environmental governance.

Conclusion of the paper states the green governance principles (green governance collaboration principle green governance sustainability principle, green governance collaboration principle and green governance universal paradigmatic principle) emergence in environmental education infrastructure throughout common and joint action and sustainably based green governance at the local government level in Latvia.

Key words: green governance, green governance principles, green infrastructure, environmental education.

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Introduction

The need for environmental governance to address problems of the Earth's climate challenges or to continue to solve ecosystem services exists on a large scale. By the entry into force of the high-aspiration of the Paris Agreement in 2016, it is provided that governments agree with legally binding limits to global temperature rises and commitments on curbing carbon emissions under the agreement. Green governance principles are essential in order to succeed the commonly agreed goals by governments as well as local governments.

Whilst there are clear differences in definition and interpretation of green governance or environmental governance principles, there are many areas of agreement and consensus. To some extent, environmental education infrastructure can be the basis for some interesting, but largely intellectual debate, which

is surely more important to ensure organisations at levels working towards common and agreed goals in relation to the shared environmental concerns.

Since different disciplines also focus on different sets of benefits provided by green governance and environmental education infrastructure, the current paper will concentrate on a multi-disciplinary approach describing social and economic activity and environmental concerns related with local governments. Green governance principles and sustainable development implementation should be based on local level solutions and initiatives designed with and by the local government. Local level solutions and initiatives become important if we talk about implementation of renewable energy and energy efficiency measures, promoting mobility, innovation etc. local green governance.

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The **research question** explores – whether green governance principles conjunct with environmental education infrastructure in the local context in the European Union and Latvia.

The **aim of the paper** is to investigate interdisciplinary approach of the green governance principles and discover development of environmental education infrastructure in the local context in the European Union and Latvia.

The **tasks of the paper** are following:

- 1) define green governance and green governance principles;
- 2) reveal environmental education infrastructure;
- 3) investigate green governance principles' conjunction with environmental education infrastructure in the local context.

The **research methods** are based on case study research method as a source of theoretical insight that tends to embrace a range of research designs that use governance as an exogenous factor in political environment. Case itself is important for what it reveals about the phenomenon and for what it might represent.

The paper examines the information sources and theoretical discussions regarding the green governance principles reflecting theoretical approach described by Weston B. H., Bollier, Biermann F., Adger N., Jordan A. and environmental education infrastructure construct by various scholars Leopold A., Carson L.R., Naess A., Brudtland G.N., Palmer G.N.,J. and Stevenson R.B., Brody M. The research findings are discussed with an emphasis on the analysis of each theoretical construct in synthesis of analyse of green governance principles and environmental education infrastructure integration throughout EU Eco-Management and Audit Scheme (EMAS) study and European Commission report on supporting the Implementation of Green Infrastructure capacity building, training and education in relation to

green infrastructure application to local government level.

Research results and discussion

1. Defining green governance and green governance principles

Defining of green governance principles requires a theoretical foundation of "governance" concept and to reveal "green governance" construct. Green governance and related issues have gained significance in the field of applied social sciences. The concept of governance can be defined in a variety of ways and there is no consensus among academics regarding its core elements (Kersbergen K., Waarden F., 2004; Biermann F., 2010, Adger N., Jordan A., 2009). Kersbergen K. and Waarden F. define governance as "systems of rule, as the purposive activities of any collectivity, that sustain mechanisms designed to ensure its safety, prosperity, coherence, stability, and continuance". However, for Biermann F. refers to a "...new forms of regulation that go beyond traditional hierarchical state activity. It usually implies some form of self-regulation by societal actors, private-public cooperation in the solving of societal problems, and new forms of multilevel policy" (Biermann F., 2010).

Most academics recognize governance as multidimensional and highly contested term. Indeed, many expert views go beyond regulation, government and law, they recognize governance for sustainability, global environmental governance, human development and environmental governance (Adger N.W., Jordan A., Biermann F., Weston B., Bollier D.). By Adger N.W. and Jordan A., governance is related with governance of societies in ways that facilitate sustainability and is likely to be a hugely complicated and politically contested undertaking. Also Delmas M.A. and Young O.R. refer to sustainability and green governance interrelation "shifting the discourse from the conventional idea of environmental protection to

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the new – and still contested – idea of sustainable development that intensifies the growing need for governance" (Delmas M.A., Young O.R., 2009).

Indeed, sustainability is an environmental issue, while it goes beyond measures and regulatory interventions of market responses to keep systems of rule as the purposive activities of any collectivity.

As the global economy and international politics progress (entry into force of the high-aspiration Paris Agreement in 2016), the way it interacts with the social and environmental spheres becomes increasingly evident to society. As such, theorists tend to perceive governance within the concept of green governance (Biermann F., Weston B., Bollier D). In these studies, green governance elements can be identified to provide the basis for establishing constructs for the collective governance of common goods.

Weston B. and Bollier D. recognize that the collective governance is a necessary instrument of change for a State/Market world order that is failing to act as a responsible steward of our planet (Weston B.H., Bollier D., 2015). From the local to the international level, agency, within the concept of green governance, is not restricted to states and governments, but encompasses the participation of a myriad of public, private and non-state actors (Biermann F., 2010). In Biermanns F. view, the elements can be identified and provide the basis for establishing constructs for the collective governance of common goods or, in other words, green governance.

The concept of green governance provides understanding of integration of actors in the decisions and actions of a group. As such, organized groups develop collective solutions to common resource problems. Actors' involvement and actions of organized group is the basis of all

collective action, since governance must propose actions which promote involvement through non-financial means.

Weston B. and Bollier D. argue that an expanding Commons Sector can help provide an alternative to both state and market. It would provide vernacular law governance dedicated to equitable and sustainable use of resources – what they call "green governance." Instead of private owners free to do things with their property that harm the wider community and environment, or governmental authorities imposing rigid rules and often arbitrary commands, the principles of human rights and environmental sustainability would be built into the basic rules governing the commons and would be applied by people who have a direct interest in their protection (Weston B. H., and Bollier D., 2013).

Furthermore, Weston B. H., and Bollier D. did explained the basic framework of green governance from the Law of Commons perspective that are characterised as law and policy that support rights based on ecological governance (green governance) and developed three distinct interrelated fields - general internal governance principles; macro-principles and policies and legal institutional structures and policies (Weston B. H., and Bollier D., 2015).

According to Ostrom E., any group which has to become organized to obtain collective benefits will discover that there is a minimum organizational cost that must be met, regardless of whether the group has a low-level of formal organization or an informal agreement (Ostrom E, 1990). He designed core design principles, first published in 1990, which remain the most solid foundation for understanding the internal governance of commons as a general paradigm.

Academics Poteete, Janssen, and Ostrom E. summarized and elaborated the key factors enabling self-organized groups to develop

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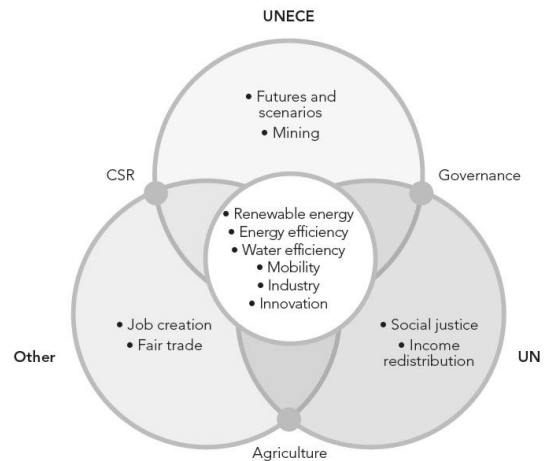
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collective solutions to common-pool resource problems at small to medium scales. Among the most important are the following:

- 1) reliable information is available about the immediate and long-term costs and benefits of actions;
- 2) the individuals involved see the resources as important for their own achievements and have a long-term time horizon;
- 3) gaining a reputation for being a trustworthy reciprocator is important to those involved;
- 4) individuals can communicate with at least some of the others involved;
- 5) informal monitoring and sanctioning is feasible and considered appropriate;
- 6) social capital and leadership exist, related to previous successes in solving joint problems (Bollier D., Helfrich E., 2012).

Any common action cultivates trust and reciprocity and therefore enhances its chances of stable collective management. However, constitutional rules must be seen as fair and respectful. To this end, environmental common rules must embody the values of human dignity.

In the international organizations' view, sustainability, governance and green governance concept relates with institutional arrangements and multilateral environmental agreements as well as environmental performance reviews. There are clearly unresolved issues around the definition and understanding of key terms. Figure below shows how some of these definitional issues overlap from the perspective of the UNECE, the United Nations and other institutions representing Governance, Agriculture and CSR (Corporate Social Responsibility and environmental reporting) interaction.



Source: EEA, 2011 (*Green Economy, 2016*)

Fig. 1. **Defining governance in the context of the Green Economy**

Figure illustrates interpretation of governance with some key organisations' assessments in the context of the green economy. However, whilst different countries and organisations define the green economy, green governance and resource efficiency differently, this should not be a reason for inaction but could be the basis for further dialogue.

The key principles of green governance and sustainable development underlying integration of environmental, social, and economic concerns into all aspects of decision making. It is concept of integration that distinguishes green governance and sustainability from other forms of policy. According to the green governance principles, the following characteristics might be recognized:

- 1) sustainable development and collaboration principle;
- 2) collaboration governance principle;
- 3) universal paradigmatic principle of integration and systematization (Dernbach, J. C., 2003).

In order to strengthening the green governance principles' implementation, it requires policy makers and practitioners at local governance level to support knowledge based methods, for instance, knowledge sharing, dissemination of best practices, better

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compliance, awareness raising campaigns. Due to the wide dimension of environmental themes, like climate change, waste management, energy efficiency, CO2 emissions, the green governance becomes institutionalised within organisational fields, more complex and fragmented (Dernbach, J. C., 2003). Nevertheless, the aim of green governance is to improve the environment essentials in different sectors - buildings, water, transport, public health, industry, climate, rural abandonment and energy.

After compiling and analysing the aspects of green governance construct and their respective theoretical references, furthermore will follow the analysis of environmental aspects and theoretical concepts linking environmental education infrastructure. In order to do so, the last section describes exploratory case study regarding green governance principles' conjunction with environmental education infrastructure in the local context.

2. Understanding environmental education infrastructure

Revealing environmental education infrastructure combines "environmental education" that is recognized by various scholars (A. Leopold, L.R. Carson, Arne Naess, G.N. Brudtland G.N., J.Palmer) and "green infrastructure" as multi disciplinary construct that is encountered in various political documents mostly deliver by the European Environmental Agency.

As such, environmental education is a relatively new and unique field of practice and study recognized as interrelation of the environmental movement combining an ecological orientation with a learning paradigm to provide a vigorous educational approach to environmental concerns (Palmer J., 2003). Indeed, environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and

expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978). Environmental education refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behaviour and ecosystems in order to live sustainably.

The previous analysis revealed construct of green governance that relates with decision-making process recognizing the environmental values and norms. According to this statement, the theoretical definition of environmental education regarded as most appropriate revealing aspects of the environmental education infrastructure "environmental education is a process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulating of a code of behaviour about issues concerning environmental quality" (Stevenson R.B., Brody M., 2014). Environmental education for society and economical sustainability situates local knowledge about practical and theoretical considerations of environment within indigenous people's social movements.

The second component of environmental education infrastructure requires understanding of term "green infrastructure" that is not widely recognised and is seldom encountered in theoretical studies but can be recognized in documents of international agencies (mostly deliver by the European Environmental Agency).

As such, green infrastructure is defined as a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide

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range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation. While it is also noted that a network of healthy ecosystems is needed, since it provides cost-effective alternatives to traditional "grey" infrastructure and offers many other benefits for both EU citizens and biodiversity (Communication from the Commission, 2013). Therefore, the environmental education infrastructure offers opportunities for the socio-economic development of local communities. It connects national parks, nature parks and biosphere reserves at the local government's level.

The term "green infrastructure" has been adopted by the various designs. The term is used for a network of green features that are interconnected and therefore bring added benefits and are more resilient. Another common feature is the aim to either protect or develop such networks (The concept of green infrastructure, 2011).

Different disciplines also focus on different sets of benefits provided by green infrastructure.

The focus of the term "green infrastructure" is on the development and protection of networks of green, natural features. Green infrastructure is not only about connecting ecosystems *per se*, but also about strengthening them and their services — which can be done by (re-) connecting measures, but also by improving the landscape's permeability (which implicates different ecosystems).

There are three approaches how green infrastructure can be related with education.

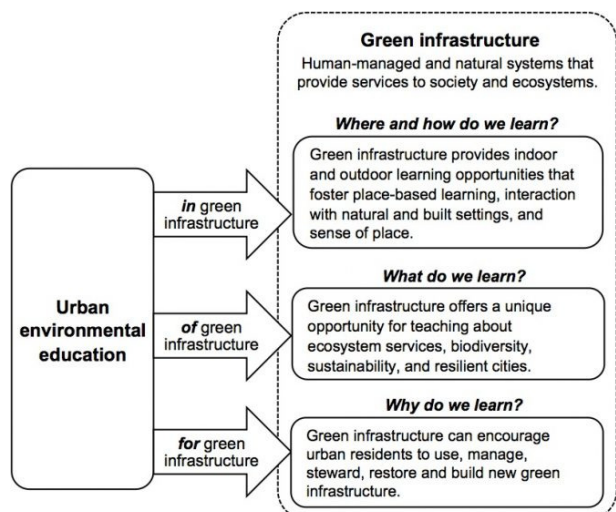
1) Education in green infrastructure refers to the rich opportunities for place-based education in cities. Here we discuss opportunities for using green infrastructure in classroom and after school activities and deepening student contact with and attachment to their local environment.

2) Education of green infrastructure refers to the vast learning opportunities provided by infrastructure projects in cities, where ecosystem services are entangled with human development and can teach fundamental lessons about systems thinking, sustainability, and resilience.

3) Education for green infrastructure focuses on the need for increased public education regarding the benefits of green infrastructure, which could increase public support, management, and stewardship of present and future green infrastructure projects (The concept of green infrastructure, 2011).

The figure Nr.2 below describes green infrastructure as human-managed and natural systems that provide services to society and ecosystems. It asks the main questions – *where and how do we learn? what do we learn? why do we learn?*

The figure No.2 is drafted by the Nature of cities initiative, which provides contribution from around the world, fundamentally multidimensional experts including scientists and practitioners.



Source: The nature of cities, 2016

Figure 2. Urban environmental education in, of, and for green infrastructure

Green infrastructure studies provide a broad array of human and ecosystem services in areas of food, energy, security, climate regulation,

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water management, education, and aesthetics. One of the local green governance aspects is related to the education that is based on green infrastructure development principles.

3. Green governance principles conjunction with environmental education infrastructure in the local context

The research conducted adopted an exploratory perspective. It is based on case study research method as a source of theoretical insight that tends to embrace a range of research designs that use governance as an exogenous factor in political environment. Case itself is important for what it reveals about the phenomenon and for what it might focus on contemporary events within an active context (Yin, R.K. 2009). The paper's research questions explore – *whether green governance principles conjunct with environmental education infrastructure in the local context in the European Union and Latvia?*

The paper examined theoretical discussions regarding the green governance principles and environmental education infrastructure construct; therefore, the research findings will be discussed with an emphasis on the analysis of each theoretical construct in synthesis of analysis of green governance principles and environmental education infrastructure integration throughout EU Eco-Management and Audit Scheme (EMAS) study application at local government level and European Commission report on supporting the Implementation of Green Infrastructure capacity building, training and education in relation to green infrastructure (European Commission report, 2015). In order to attain the aim of the paper, the authors analysed Eco-Management and Audit Scheme (EMAS) supported in scope of the project "Innovative approach in EMAS II implementation in municipalities" study results (Innovative approach, 2007), which was carried out in local governments in Latvia. The EMAS project will be used as environmental education

infrastructure development instrument and reveal implementation of the green governance principles.

In order to describe implementation of green infrastructure education, the authors referred to recently published European Commission report on supporting the Implementation of Green Infrastructure capacity building, training and education in relation to green infrastructure. It underlines integrating green infrastructure into key policy areas, for instance energy, transport, waste management improving the knowledge base and encouraging innovation in relation to green infrastructures, and assessing opportunities for developing environmental education infrastructure. From the green governance perspective, environmental education infrastructure comprises identification of initiatives that already exist across the Member States and educational institutions.

The local governments are responsible for safeguarding the environment, only a few of them implement a truly systematic approach, i.e. take measures that create environmental awareness. However, the measures may be unrelated to the green governance approach or provide an efficient environmental policy: the introduction of improvements in the fullest possible extent of policy implementation.

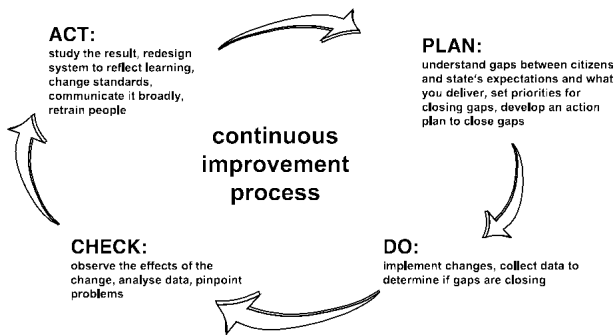
Green governance development process includes – environmental awareness, environmental activities, environmental management, continuous improvement process.

In order to implement a continuous green governance, development process requires commitment, operational structure and routine control. Furthermore, continuous improvement process entails planning, doing, checking and acting.

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Source: *Innovative approach*, 2007

Figure 3. **Continuous improvement process**

If green governance development is implemented in a systematic way, it can be referred to environmental education infrastructure since acting phase includes study the results, redesigning system to reflect learning, change standards, communicate it broadly and retain people. Therefore, the first *green governance sustainable development and collaboration principle* emerges throughout continuous green governance improvement process.

Local governments have issues in common. As such, they are responsible for a clean and safe living space for their citizens, they have to follow a number of procedures, they tend to have limited resources for business and civil society to meet their needs. The EU Eco-Management and Audit Scheme (EMAS) is a management instrument developed by the European Commission for municipalities and other organizations to evaluate, report, and improve environmental performance. The environmental performance is necessary to introduce an environmental education infrastructure. Despite differences in the local governments, there are many co-operation and exchanges of experience regarding green governance development (for instance, public awareness-raising campaigns on environmental themes; campaigns; application for joint projects aimed at improving the environment). Neighbouring local governments join forces in order to implement green

governance principles development throughout environmental education infrastructure (for instance, learn from each other and share EMAS implementation experiences and solutions, learn more about the differences and similarities of their members). Green governance offers practical support in integrating sustainability principles into local policies and actions and can be recognized as *green governance collaboration principle* (for instance, throughout EMAS network that is dedicated to local governments). However, by signing up to the Covenant of Majors initiative, local governments commit to taking the necessary energy efficiency and renewable energy measures (Covenant of Mayors). Therefore, it entails contribution to the dissemination of environmental knowledge and awareness through sector aims as well as raise awareness among the general public. Acknowledging of human actions and influence on nature and its processes is essential for local government institutions to be capable of working respectfully and coordinated, for example, waste management services in North Vidzeme Region (coordination in among regional local governments) including waste collection, sorting, transportation, recycling and disposal in an environmentally friendly way at local level (The North Vidzeme Region initiative).

The green governance sustainability principle in local context reflects value of the benefits that nature provides to human society and mobilises investments to sustain and enhance them. It also helps avoid relying on infrastructure that is expensive to build when nature can often provide cheaper, more durable solutions. Sustainability ensures operational directions, which interact and supplement each other for higher efficiency, self-sufficiency and sustainability. Manufacturing of the ecologically renewable energy and growing of vegetables is one of the "Getlini EKO" technological and environmentally friendly landfill

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examples in Latvia. Landfill is based on jointly established Riga and Stopini local governments' initiative and manages to be the largest municipal solid waste landfill in the Baltic States (The Riga and Stopini Municipalities).

European Commission report on supporting the Implementation of Green Infrastructure capacity building, training and education in relation to green infrastructure supports the need for harmonization among standards at local government level:

- the potential for including or strengthening the concept and principles of green infrastructure in the different standard categories (performance, procedure, methodology);
- the interoperability between technical standards applied in different project phases (planning, design, and construction) (European Commission report, 2015).

The *green governance universal paradigmatic principle* of integration and systematization reflects as cluster approach. Effective and just environmental protection is best secured via *universal paradigmatic principle* as rights-based green governance, or operational from local to global and administered according to principles rooted in respect for nature and fellow human beings. The emission reduction and energy efficiency targets already are set by the EU and entered into force of the high-aspiration of Paris Agreement in October 2016 that is relevant and enforceable at signatory countries. The pragmatic approach is based on the principle of protecting and enhancing nature and natural processes. It has ties with agriculture, forestry, nature, water, marine and fisheries, regional and cohesion policy, climate change, transport and energy.

Conclusions, proposals, recommendations

Research findings reinforce the different definition of green governance constructs that impacts environmental education infrastructure.

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The research question (whether green governance principles conjunct with environmental education infrastructure in the local context in European Union and Latvia) was discovered throughout green governance principles and was embedded in the environmental education infrastructure in Latvia. The answer of research question constitutes complex algorithm that was divided in 3 parts (discovering green governance and green governance principles; environmental education infrastructure and investigated green governance principles conjunction with environmental education infrastructure in the local context). With this in mind, it was observed that green government principles can be referred to dissemination of environmental knowledge and awareness through sector aims and raise awareness among the general public in local governments context. During the research analysis, all 3 principles for green governance were established that are considered fundamental in order to set up a green governance collaboration principle in local governments in Latvia.

Conclusions regarding governance and green governance

In accordance with theoretical discussion, most academics recognize governance as multidimensional and highly contested term.

Green governance elements can be identified to provide the basis for establishing constructs for the collective governance of common goods (such as environment and sustainability).

Overall, green governance principles address local context and social diversity in structuring social, economic activity and environmental problems that require understanding values in social and economic thought to account for nature and social well-being.

Sustainability and green governance concepts relate with institutional arrangements and

multilateral environmental agreements as well as environmental performance reviews.

For strengthening the green governance principles' implementation, it is necessary for policy makers and practitioners to support knowledge based methods, for instance knowledge sharing, dissemination of best practices, better compliance, awareness raising campaigns at local governance level.

Conclusions regarding environmental education infrastructure

Construct of green governance relates with decision-making process recognizing the environmental values and norms.

In accordance with theoretical discussions, environmental education and its supporting infrastructure increase opportunities for the socio-economic development of local communities.

Green infrastructure studies provide a broad array of human and ecosystem services in areas of food, energy, security, climate regulation, water management, education, and aesthetics.

Academics agree that there are considerable differences in among - environmental education *in*; environmental education *of*; and environmental education *for* green infrastructure.

Conclusions regarding research part of the paper

Construct of environmental education infrastructure is referred in various policy supporting documents and examples in Latvia and the European Union.

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If green governance is implemented in systematic way, it can refer to environmental education infrastructure and it includes environmental awareness, environmental activities, environmental management, continuous improvement process.

The paradigm of green governance is compelling because of environmental values, norms and rights at all levels starting from global, European Union, national and local governance level.

The green governance perspective of environmental education infrastructure comprises identification of initiatives (knowledge sharing, dissemination of best practices, better compliance, awareness raising campaigns) that already exist across European Union Member States.

The green governance principles (*green governance collaboration principle, green governance sustainability principle, and green governance universal paradigmatic principle*) emerge in environmental education infrastructure throughout common and joint action and sustainable planning at the local government level in Latvia and the European Union.

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