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**Interpretation and Management of Sustainability
Issues with the Integration of the Subjective -
Application in Water Management**

Doctoral (Ph.D.) dissertation

THESES OF PHD DISSERTATION

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2015 Budapest

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RESEARCH BACKGROUND

Humanity is facing many new challenges through climate change, population growth, loss of biodiversity, spread of consumer culture, etc. The main question of sustainability is if humanity can survive in a new equilibrium that will be created by some of these processes. Former actions of society towards the environment (burning forests by natives, aggressive land acquisitions by occupant nations, large scale chemical agriculture led by ideologies, the modern societies' neurotic consumption behavior) seem to be very inefficient when looking for a balanced environmental-social-economical system where humanity could survive. To create maintainable human living conditions for us and future generations with the use of the limited resources, there is a need for high level international cooperation. However, reality shows that nowadays between and within societies ideological and religious disagreements, emotions rule. As there are children starving to death in certain countries, in other parts of the world people are living a luxurious, though often unhappy life. In a world like this, with a threatening environmental crisis, it is not easy to maintain human living conditions and individual intellectual freedom for everyone.

These environmental-social-economic problems may be best expressed with the term "sustainability problems". Although often criticized and lacking a widely accepted definition, I still use the term sustainability, as in my opinion at the moment we are lacking a better alternative when dealing with the above mentioned problems.

The dissertation explores the often debated issue of sustainability (Bándi (2013), Bartus (2013), Bulla et. al (2006), Kerekes (2012), Szlávik (2007), Valkó (2003), National Council for Sustainable Development (2013) etc.) and shows a new way to interpret and manage the problems regarding it. The basic idea of the research is that the interpretation of sustainability problems is a subjective process, as interpretations are based on different ideologies, schemes, attitudes, conceptual structures, etc.

AIM AND FRAMEWORK

In my dissertation I attempt to create a new conceptual model that shows both the objective (for example the environmental and economic processes) and subjective factors (human factors) playing a role in sustainability problems. For this, the fourth pillar of sustainability, the human factor (in the dissertation mentioned as the subjective) has to be integrated into the other three pillars. My goal is to apply the model at the general field of sustainability questions, then to apply it at the more specific area of water management. In order to achieve this I have set the following hypotheses:

1st HYPOTHESIS Integration of the subjective factors is needed in order to understand and manage sustainability issues

First, based on works dealing with psychosocial development theories and social values change (Beck and Cowen (1996), Cook-Greuter (2000), Esbjörn-Hargens and Zimmermann (2009), Gebser (1985), Graves (1970), Hamilton (2008), Inglehart and Baker (2000), Koestler (1988), Maslow (1943), Piaget (1999), Wilber (1997)), I analyze the role of the subjective in sustainability questions. I have assumed that the interpretation and management of

sustainability issues are effected by the subjective, here meaning the psychosocial development and values change of the societies.

2nd HYPOTHESIS Exploration of subjective and objective factors with the application of the integral sustainability model helps to understand and manage sustainability issues

I assume that a new conceptual model can be created, or from already existing theories developed, whose application will provide a possibility for a more holistic understanding and management of sustainability problems.

With the help of the new conceptual model built on the integral theory (Wilber (1995), (1996), (1997)) and integral ecology (Esbjörn-Hargens (2009)) we can present the understanding of sustainability in a multidisciplinary approach as follows:

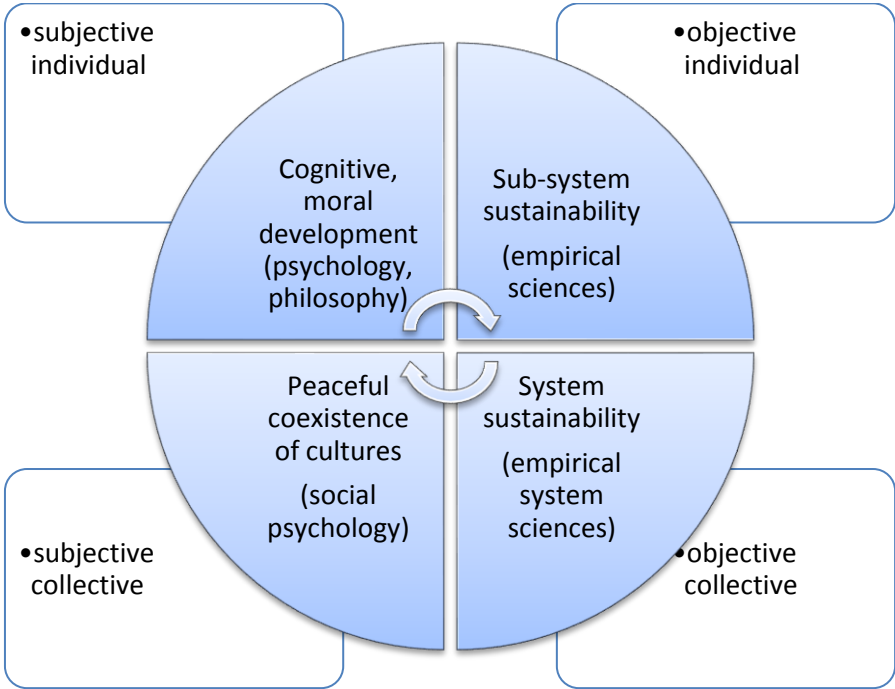


FIGURE 1: INTEGRAL THEORETICAL APPROACH OF SUSTAINABILITY¹

3rd HYPOTHESIS The integral sustainability model is applicable to sub-fields of sustainability

I suppose that the integral sustainability model can be applied to sub-fields of sustainability such as water management, which can contribute to understand and manage the issues of sustainability in this area.

The integral theory attempts to organize the processes of the world in a common model. Obviously, even if we managed to succeed, the limitations of showing all these processes will lead to very shallow results. To be scientifically complete, I present the framework of the research in chapter 1.2 in detail. The frames of the researched area were defined by my scientific knowledge and the field needed to prove the hypotheses.

¹ Own design

METHODOLOGY

The research follows the steps of the hypothesis-argumentation-thesis. The argumentations of the hypotheses were done with theoretical examination (chapter 2.), with literature overview (chapters 3.4, 4.2) with case study examination (indicator analyses (chapter 4.3.1) and historical analyses (chapter 4.3.2)) and with total economic value assessment (chapter 4.4). The research attempts to prove the hypotheses and accept them as theses, or they will be rejected.

NEW SCIENTIFIC ACHIEVEMENTS

The main result of the dissertation is a new conceptual model, the integral sustainability model. On the input side of the model the psychosocial characteristics of the individuals interpreting and managing sustainability problems, and their chosen methods for interpretation and management are shown. On the output side the different meanings of sustainability issues appear.

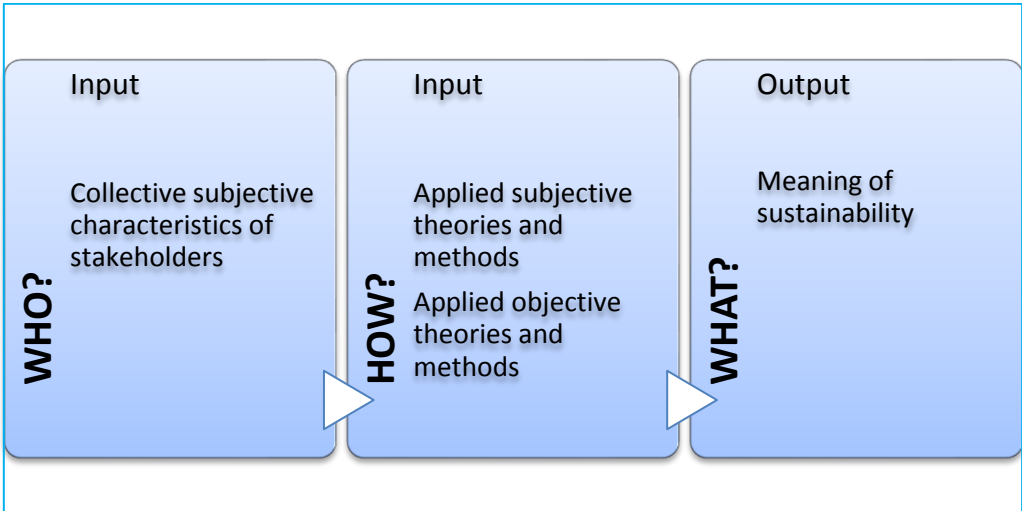


FIGURE 2: THE NEW CONCEPTUAL MODEL OF INTEGRAL SUSTAINABILITY²

² Own design

The application of the integral sustainability model resulted in the following collection of options for interpretation and management of sustainability issues:

Subjective interpretation	Subjective management	Objective interpretation	Objective management
<ul style="list-style-type: none"> - The evolution of scientific theories; industrialization - Religions, ideologies and ethics - Consumer habits - Hierarchy of needs and shadow work - Environmental control-, and stress theory - 4 stress theory - Technology addiction theory - Reaction to environmental risks theory - Low-Cost- High-Cost- theory - Neurotic society - Relative maturity of society - Values change in society and Maslow's hierarchy of needs - Integral theory - Integral ecology 	<ul style="list-style-type: none"> - Wilderness experience - Gaia theory - „Back to the roots“ - Spontaneity - UK Sustainable development strategy's psychological case study - DE Ecological tax reform's psychological case study - Communities - Eco-villages - Environmental ethics - Yogic lifestyle 	<ul style="list-style-type: none"> - Ecological overshoot - Water scarcity - Crossing planetary boundaries - Loss of biodiversity - Irreversible processes of climate change - Unsustainable nature of monetary systems - Population growth - Growing consumption needs of wealthier societies - Unbalanced distribution of resources - Unsustainable consumption behavior - Agro imperialism - The role of economics - Rebound effect - Large-scale corporate-controlled activities 	<ul style="list-style-type: none"> - Human development index - Subjective well-being - ECO 21 - Complex sustainability indicators group - Footprint group - Environmental economics - Blue economy - Service economy - Buddhist economy - Consumption behavior and development models

TABLE 1: INTEGRAL COLLECTION OF SUSTAINABILITY PROBLEMS AND THEIR MANAGEMENT OPTIONS³

The new model has been altered according to the criteria of the sustainable water management in order to get the integral model of sustainable water management. This altered model was then applied to general water management issues as well as to two case studies:

- To compare the countries of the Danube river basin, according to the integral model I have created an indicator group, which I called sustainable water management potential. It consists of three sub-indicators: the economic potential, the environmental-water management potential, and the one that integrates the subjective, the socio-cultural potential.
- I have proven the reasons for why in Hungarian politics the topic of the Bős-Gabcsikovo Hydropower System is avoided. For this I have analyzed its history from both the viewpoint of the economic policy (objective) and the viewpoint of social value changes (subjective) as well.

³ Own compilation

Based on the idea of holarchy, I developed a more complex model, the integral-holarchic water management model. For this model I used an economic value analysis to interpret the role of water:

Graves levels	Für-Ijjas levels	Thinking structure	Components of total economic value	Examples for the practical components of water values
A-N	Surviving individuals	instinctive, automatic	No interpretation of water	water for drinking
B-O	Superstitious clans/tribes	animistic, autistic, ritual, mythological, superstitious	Superstitious interpretation	water for drinking, sacrifice to the spirit of water, fishing, means of transportation
C-P	Egocentric warriors	egocentric, dominated by power	Use values: direct use values	sufficient drinking water supply, fishing, means of transportation, simple irrigation
D-Q	Conformist groups	absolutistic, obedient, conforming	Use values: direct use values, indirect use values	sufficient and quality drinking water, sanitation, waste water treatment, laws for good chemical water quality, irrigation, fishing, means of transportation, holy water, cooling of power plants
E-R	Creative hedonists	multiplistic, rational, materialistic, individualistic, modern	Use values: direct use values, indirect use values, option values, quasi-option values	drinking water, sanitation, modern irrigation technologies, directives and strategies for good chemical and biological water quality, desalination power plants, fishing, transportation, watersports, recreation, sustaining wetlands to reserve not yet discovered genetic information
F-S	Communities of human beings	relativistic, egalitarian, post-modern, vision-logic	Use values: direct use values, indirect use values, option values, quasi-option values Non-use values: bequest values	drinking water, sanitation, right to water, environmentally sound, water efficient irrigation technologies, water plants with fish passes, water recreation, wetlands as ecosystems, wetlands in good ecological status, future generations have a right to experience the wetlands
G-T	System-thinking humans	Systemic	Use values: direct use values, indirect use values, option values, quasi-option values Non-use values: bequest values, existence values	drinking water, sanitation, right to water, water and ethics, environmentally sound, water efficient irrigation technologies, water plants with fish passes, water recreation, wetlands as ecosystems, wetlands in good ecological status, future generations have a right to experience the wetlands, wetlands have a right to exist

TABLE 2: INTEGRAL-HOLARCHIC VALUE ASSESSMENT OF WATER⁴

⁴ Own compilation based on Pearce and Turner (1990) Kerekes and Szilávik (1999) Marjainé Szerényi (2000) Für, Ijjas (2012)

THESES

At the end of chapter 2 I came to the conclusion that the 1st Hypothesis is true, meaning that the interpretation and management of sustainability issues are fundamentally effected by the subjective, or its definition used within the dissertation, which is the psychosocial development of people and the value change of societies.

THESIS 1 INTEGRATING THE SUBJECTIVE IS CRITERIA FOR UNDERSTANDING AND MANAGING SUSTAINABILITY ISSUES

Related publications: Ijjas F (2008); Ijjas F, Valkó L (2011); Ijjas F (2013); Ijjas F (2014)

In chapter 3 I created a new conceptual model in order to gather the options for interpretation and management of sustainability problems. This model was named integral sustainability model. The newly created model was used to prove Hypothesis 2, which states that by presenting both subjective and objective factors, the model allows for a more holistic approach of understanding and handling sustainability problems. For example the idea of “immature society” (neurotic society, relative maturity of society, materialist social values, etc.) shows us, that the background causes of sustainability problems are often of subjective nature.

THESIS 2 THE APPLICATION OF THE INTEGRAL SUSTAINABILITY MODEL SUPPORTS THE HOLISTIC UNDERSTANDING AND MANAGEMENT OF SUSTAINABILITY ISSUES BY SHOWING BOTH SUBJECTIVE AND OBJECTIVE FACTORS

Related publications: Fűr A, Ijjas F; (2012); Ijjas F (2014); Ijjas F (2015)

At the end of chapter 4 I came to the conclusion that Hypotheses 3 is true, meaning that the integral sustainability model can be transferred to the field of water management as well, which can contribute to understand and manage the issues of sustainability in this area.

THESIS 3 THE INTEGRATIVE SUSTAINABILITY MODEL CAN BE APPLIED IN WATER MANAGEMENT

- ***SUB-THESIS 3.1 The Hungarian energy policy discriminates the thorough analysis of water energy utilization options.***

The integral historical analysis of the Bős-Gabcsikovo Hydropower System shows that the main motive for sub-thesis 3.1 is the taboos that exist about hydroelectric power plants in Hungary.

- ***SUB-THESIS 3.2 The integral-holarchic model of sustainable water management can be used for a complete economic value analysis of environmental resources, such as water.***

Related publications: Ijjas F, Valkó L (2011); Fűr A, Ijjas F; (2012); Ijjas F (2013); Ijjas F (2014); Ijjas F (2015)

ASSUMPTIONS AND APPLICATIONS

Based on the model I have the following general suggestions concerning the interconnectedness of psychosocial development, social value systems and sustainability efforts of countries and subcultures. I suggest that management methods (input side of the integral sustainability model) should only be applied according to a specified value system. In societies where the dominance of the conservative values have not yet appeared (for example dictatorship countries), instead of drawing up environmental questions, strategies and action plans - satisfying basic needs and consolidating basic human rights - should be considered. In societies with dominant conservative values environmental regulations in forms of norms and fines shall be applied. If modern values are dominant, economic incentives such as product charges, CSR, environmental management systems, emission trading, etc. can be recommended. In the case of the appearance and consolidation of postmodern values a more general and higher environmental awareness can be seen, and thus expectations towards the society for an independent and responsible sustainable consumption and behavior can grow.

The role of the subjective can also appear in the indicator analysis of EU projects. Although methodically it is very complex to measure, it would be important to know to what extent project success is influenced.

There are many unanswered questions about sustainability that should be dealt with.

The United Nations World Water Development Report 2015 has placed the issue of water in the center of sustainability questions. However, instead of the four pillars of sustainability only three pillars have been used. The human pillar has been left out of the report, although the question of social equality, which is based on cultural values, is emphasized within the social pillar. Integrating the subjective into the criteria of sustainable water management could provide new information for international water researches.

Further possibilities for the use of the model are broad; therefore it would be worth to apply the model in other areas, such as in the field of Hungarian energy management as well.

Profound psychological analyses could further contribute to future researches.

OWN SCIENTIFIC PUBLICATIONS RELATED TO THE DISSERTATION

Book, monograph, bookchapter

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Articles in scientific journal; Web of Science database

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Articles in scientific journal; Scopus database

5. Ijjas, F. (2015) Social indicators and ethics in sustainable water management. In: Periodica Polytechnica, Social and management sciences OnlineFirst (2015) paper 8074 DOI: 10.3311/PPso.8074

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